Effect of a Triage-based E-mail System on Clinic Resource Use and Patient and Physician Satisfaction in Primary Care

A Randomized Controlled Trial

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OBJECTIVES: E-mail communication between patients and their providers has diffused slowly in clinical practice. To address concerns about the use of this technology, we performed a randomized controlled trial of a triage-based e-mail system in primary care.

DESIGN AND PATIENTS/PARTICIPANTS: Physicians in 2 university-affiliated primary care centers were randomized to a triage-based e-mail system promoted to their patients. E-mails from patients of intervention physicians were routed to a central account and parsed to the appropriate staff for response. Control group physicians and their patients did not have access to the system. We collected information on patient e-mail use, phone calls, and visit distribution by physician over the 10 months and performed physician and patient surveys to examine attitudes about communication.

RESULTS: E-mail volume was greater for intervention versus control physicians (46 weekly e-mails per 100 scheduled visits vs 9 in the control group at the study midpoint; \( P < .01 \)) but there were no between-group differences in phone volume (67 weekly phone calls per 100 scheduled visits vs 55 in the control group; \( P = .45 \)) or rates of patient no-shows (5% in both groups; \( P = .77 \)). Intervention physicians reported more favorable attitudes toward electronic communication than did control physicians but there were no differences in attitudes toward patient or staff communication in general. There were few between-group differences in patient attitudes toward electronic communication or communication in general.

CONCLUSIONS: E-mail generated through a triage-based system did not appear to substitute for phone communication or to reduce visit no-shows in a primary care setting. Physicians’ attitudes toward electronic communication were improved, but physicians’ and patients’ attitudes toward general communication did not change. Growth of e-mail communication in primary care settings may not improve the efficiency of clinical care.

KEY WORDS: e-mail; utilization; primary care; on-line communication; patient-provider communication.


Proponents of e-mail and Web-based communication between patients and their providers advocate that these new modes of communication have enormous potential to alter the nature of communication and improve access to care in clinical delivery systems. The asynchronous aspect of on-line patient-provider communication may free patients and providers from the time and place constraints inherent in traditional modes of communication such as face-to-face visits or phone calls. The versatility of on-line communication can be harnessed to address patients’ diverse information and service-related needs efficiently. Messaging tools can provide a “portal” by which patients can communicate directly with providers and staff about health problems or to receive information from the medical record such as test results. Additional tools can be used to facilitate receipt of medications, scheduling changes, or billing issues. Ultimately, a patient portal providing this array of functions could improve the efficiency and effectiveness of health care.1–3

However, there are many challenges and barriers to current use of on-line communication in the clinical setting. Though general use of e-mail and Web-based electronic communication has grown dramatically,4 they have diffused very slowly in clinical practice.5 Although there is increasing interest within clinical delivery systems in building Web-based communication tools for patients, most electronic communication between patients and their providers relies on e-mail, much of which is unsolicited and uncoordinated.

Several reasons explain slow diffusion. First, thus far payors have largely resisted reimbursing providers for this type of exchange. This lack of a reimbursement mechanism has delayed investments by medical organizations in on-line communication and has motivated discussions about its economic and clinical value. In particular, payors and providers are questioning whether on-line communication will substitute for clinic resources such as phone calls or
visits, or whether it will be an “add on,” increasing clinic workload and costs. Second, providers have concerns about the appropriate use of e-mail communication in clinical practice and the potential hassle of responding to difficult or complex messages. Although some physicians are encouraging selected patients to e-mail them directly, many physicians are resisting routine use of e-mail with patients because of these concerns. Third, there are enormous concerns among clinical practices and delivery systems about how to build e-mail or Web-based patient-provider portals and how to integrate them into existing operations and information systems. Finally, although some patients appear to be willing to communicate by e-mail, many patients may be hesitant to send messages because of their uncertainty about whether messages will be answered in a timely fashion.

To begin to address these concerns, we built a triage-based e-mail communication system and performed a randomized controlled trial of its use in an academic primary care setting. The study addressed several questions: Does a triage-based e-mail communication tool increase electronic communication between patients and providers? Does increased e-mail communication between patients and the clinic team substitute for phone calls or decrease patient no-shows to clinic? Does e-mail communication improve patient or provider perceptions of communication? We hypothesized that enhanced e-mail communication would reduce phone calls and no-show visits and improve communication between patients and their providers.

METHODS

The study was a randomized controlled trial in 2 large university-affiliated primary care clinics located in the Midwest from August 2000 through June 2001. Participants were 24 staff physicians and 74 resident physicians in internal medicine and family practice. Three staff physicians and 2 residents practicing during the study period declined to participate in the study. Staff physicians averaged 35 scheduled visits per week (range 12 to 50 visits), while resident physicians averaged 6 scheduled visits per week.

Physicians were randomized into 2 groups, intervention (N = 50) and control (N = 48). The patients of the intervention physicians were encouraged to use a new triage-based e-mail system—the Electronic Messaging and Information Link (E-MAIL)—to communicate with their physicians and clinic staff about scheduling, billing, health issues, prescription renewals, and referrals. All e-mails were automatically routed to a central resource account managed by a nurse “navigator” who routed messages within the account to appropriate staff. Physicians received copies of their messages but replied to only those requiring physician input, such as patient-specific health questions. Clinic staff entered the central account to receive and respond to messages not requiring physician input.

The e-mail system was promoted to patients of intervention physicians in several ways. Because there was no valid primary care patient roster, we promoted the system to patients who were likely to be those of intervention physicians. First, intervention physicians were encouraged to give their patients a card during clinic visits with a study-specific e-mail address on it and a description of the triage system and how to use it. Second, we mailed flyers to a random sample of 5,000 patients who had visited an intervention doctor in the prior 6 months of the study period or were scheduled to visit an intervention doctor during the study period. The flyers encouraged patients to e-mail their physician using the special e-mail addresses and educated patients about appropriate content, response times, and message handling by the clinics. Patients who used the e-mail system were asked to follow specific guidelines in e-mailing their physicians, including: 1) do not use e-mail for emergencies or for urgent messages; 2) do not use e-mail to communicate about sensitive topics, such as HIV; 3) use e-mail to communicate with your physician and health care team about the following: appointment scheduling, billing questions, health questions, prescription renewals, referrals, and test results; and 4) send separate e-mails for each type of request and include specific information (e.g., for referrals, include information about whether the referral was requested by a physician, previous visits, and preferred specialist). Additionally, all patients who used the e-mail system received automatic responses to each new e-mail message they sent, reinforcing the educational messages covered in the flyers. Finally, intervention physicians also were encouraged to forward patient e-mails from their personal e-mail accounts to the triage account and to encourage patients to use their study-specific addresses in future correspondence.

Control physicians and their patients did not have access to this account. However, independent of our study, patients of both intervention and control physicians could e-mail their physicians by using the physician’s personal e-mail account available through physicians’ personal cards (some of which had personal e-mail addresses on them) or by searching the medical center directory.

Data Collection

We collected information on e-mail and phone call volume and the visit distribution of all physicians in the study during 5 two-week periods spread evenly over the course of the study. We also performed patient and physician surveys at the conclusion of the study.

E-mail communication between patients and providers occurred directly through a physician’s personal e-mail account or, in the case of physicians in the intervention arm of the study, through the e-mail triage system. Because personal e-mail accounts could not be monitored by study personnel, we measured e-mail volume based on physician recall of the number of e-mail messages