Innovations in the Practice of Primary Care:
Communicating with Patients through E-mail

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American medicine is used to technological change. We usually think of technologic advance in terms of the latest generation of magnetic resonance imaging (MRI) scanner or the newest composite material used for hip prostheses. Clinician-patient communication and the documentation of that communication have gone through technological change as well. In 1754 the managers of the Pennsylvania Hospital, including Benjamin Franklin, adopted new rules for its physicians and surgeons. Rule eight stated that "the practitioners shall keep a fair account (in a book provided for that purpose) of the several patients under their care, of the disorders they labor under, and shall enter in the said book the recipes or prescriptions they make each of them." The recording of medical information has gone through several technological changes over the past decades. I took over the practice of Dr. James Covington in Wadesboro, North Carolina in 1984, along with some meticulous records he had kept of the patients under his care. In the course of reviewing one patient's file, I noted that the doctor's hand-written notes in 1947 had been supplanted with notes Dr. Covington had personally typed on his typewriter. As I took over his practice, I was changing the technology of documentation once again by dictating my office notes, which were then transcribed by a paid technician. My current practice of entering parts of the patient's history directly into an electronic health record underscores the distance we have come from 1754. The technology of non-face-to-face patient communication is undergoing transition today as well. Alexander Graham Bell's invention of the telephone in 1876 is being increasingly supplanted by a patient preference for clinician-patient e-mail communication. Bell warned of the resistance to change by stating, "When one door closes another door opens; but we often look so long and so regretfully upon the closed door, that we do not see the ones which open for us."[1]

Given the controversies surrounding clinician-patient e-mail, I was asked by our medical school dean to chair the E-Health Committee in October 2002 at the University of North Carolina at Chapel Hill (UNC), where I serve as a clinical faculty member in family medicine. The primary charge of the committee during my leadership was to develop a pilot for clinician-patient e-mail that would explore the usefulness and the challenges of this new technology. The group consisted of four physicians, including the chief of the hospital staff and the chair of a clinical department, information technology experts, and a marketing professional. The committee performed a literature review of relevant communications on clinical e-mail and explored commercial options that might assist us in applying the technology effectively. The committee developed a pilot Web portal to test the concept of e-mail in two UNC clinics. We developed a survey of clinicians at UNC to explore their attitudes toward doctor-patient e-mail. Finally, we made recommendations to administration on how to proceed with system-wide implementation.

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In reviewing the work already done on clinical e-mail communication, acknowledgement of the "digital divide" is particularly important in a public hospital such as UNC. Not all patients have access to computer resources. The gap between digital "haves" and "have-nots" is real but narrowing. Twenty-four percent of Americans have no direct or indirect experience with the Internet. Americans more likely to be "wired" are younger,

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well-to-do, white, well-educated, and living in non-rural areas. Southerners are the least likely to use the Internet. Only 38% of Americans with disabilities go "on-line" as compared with 63% of all Americans.[2]

Kane published a classic reference in the *Journal of the American Medical Informatics Association* that our committee relied on heavily. The article presented guidelines to facilitate effective clinician-patient interaction, while using principles that would increase patient safety and decrease lawsuits.[3] We followed suggested communication guidelines, such as establishing turnaround time standards, warning against e-mail use for urgent matters, informing patients about e-mail privacy issues, and establishing categories of e-mail transactions (prescription refills, scheduling, etc.).

More recent work on patient e-mail has been published since our committee's work. Liederman and Morefield published their experience at University of California–Davis with a commercial Web messaging system (RelayHealth®). They confirmed the high patient satisfaction of such systems with 85.8% of patients either "very satisfied" or "somewhat satisfied." Seventy-five percent of clinicians were either "very likely" or "somewhat likely" to continue using the system after the study period.[4] Waldren and Kibbe, writing for the Center for Health Information Technology of the American Academy of Family Physicians, endorse the inclusion of provider-patient e-mail in the electronic health record.[5] In a two-part series, Car and Sheikh review the progress to-date of e-mail consultations and advocate for the coordinated action of healthcare professional organizations, patient groups, policy makers, and the information technology industry to facilitate widespread use.[6]

Our E-Health Committee reviewed commercial vendors that could help us with our development. We had presentations from Medem™ (www.medem.com), Tumbleweed® (www.tumbleweed.com), MedFusion (www.medfusion.net), and RelayHealth® (www.relayhealth.com, formerly Healinx™). Medfusion has collaborated with the American Academy of Family Physicians to provide physician members with Web portals for doctor-patient communication. Additional commercial options for doctor-patient e-mail are referenced by Scherger in Family Practice Management.[7,8]

The Committee developed Web portals for patients to communicate with clinicians in the UNC Family Practice Center (FPC) and the UNC Diabetes Care Clinic. The Web portal approach was used because of the advantages it offered. The structured format of a Web site allowed for easy categorization of the type of message with routing of the message to appropriate triage personnel. Information such as medical record number and pharmacy name could be entered as data fields on a Web form. Such information is frequently forgotten by patients in unstructured e-mail messages. The Web portal approach allowed for future technical security options, such as encryption, that are more difficult to attain with standard e-mail messaging. During our committee work, we had to deal with the upcoming Health Insurance Portability and Accountability Act (HIPAA) regulations that changed the scope of our project. Warnings and privacy disclaimers were "required reading" before a message could be sent by a patient using the Web portal approach we developed. Usage growth was continual in the Family Practice Center since the project was begun in October 2001. The Webmail address was promoted on the telephone answering welcome message for the clinic, as well as posters and patient brochures throughout the Family Practice Center. At the onset of the project, just over 100 e-mails were received by the FPC each month. As of the summer of 2004, the clinic received just under 600 messages per month. For comparison, the clinic received an average of 9,623 phone calls per month during the period October 2003 through September 2004 (not all of which are answered because of the high volumes of calls). During fiscal 2004, the FPC saw 46,538 visits, or an average of 3,878 patients per month. This works out to be about 0.15 e-mails per visit compared with 2.5 phone calls per office visit. In a simpler time and a smaller practice, I described the nature of telephone calls in my own practice in the 1980s.[9] The phone call-to-office-visit ratio was one-to-32 at that time. While my small rural practice in the 1980s cannot be directly compared to a complex academic family practice center, patient communications appear to have gotten more complex over time. We are hopeful that the ratio of e-mails and phone calls to office visits is a moving target, and, with time, we can increase the e-mails while decreasing the incoming phone calls to a point that we answer a higher percentage of them promptly.

The categories of e-mail messages we received are instructive. Forty-one percent of e-mails received from the Web portal messaging system in the FPC were in the "Ask Your Doctor" category. The "Request Appointment" category accounted for 29%. Prescription refills were requested 16% of the time. During the period of use of the system, we requested patients to call their pharmacies for refills so this may have cut down on the number of e-mail requests for refills that we were getting. The remainder of the other catgories ("Cancel Appointment," "Change Appointment," "Referral Request," "Address Change," "Billing Question," and "Name Change") account for the remaining 14%. The important observation from these data is that less than half of e-mails require the direct attention of the physician. Our committee concluded that a triage system was essential for a functional clinician-patient e-mail system.

During the development phase of the e-mail pilot we conducted a survey of our physicians concerning their opinions about clinician-patient e-mail and our plans. The survey was conducted online during February 2002. The topic was received enthusiastically and we received responses from 195 clinicians. Attending physicians comprised the majority of the sample, with responses from 163 (or 84%) of the total. There were 19 non-physician practitioners and 13 resident physicians who answered the survey. Our first question asked, "Given a plan for dealing with privacy, security, and triage concerns, which statement best fits your feelings about getting e-mails from patients?" Seventy-five percent of respondents replied either that they would use clinician-patient e-mail for all or some of their patients or they would continue to use standard e-mail on their own. The remaining 25% stated that they would not use clinician-patient e-mail. There was strong physician

agreement with several of our questions. Physicians would never want to answer e-mail from patients who have not had a face-to-face visit (77%). They thought that all e-mails and responses should be part of the medical record (71%). E-mail communication was felt to improve patient satisfaction (57%). There was physician concern that patient related e-mail might increase physician workload rather than allow for improved efficiency (63%), and there was worry that patients would use e-mail for messages more appropriately communicated on the telephone or in-person (55%). Clinicians were equally split over the question "I think that documentation of e-mails in the medical record will reduce my legal liability."

Clinicians could freely comment on the survey. The range of responses underlined the potential for division in the medical staff over the topic of e-mail. Examples of positive comments were:

- "Eliminates telephone tag."
- "Scheduling appointments would flow more smoothly. Routine questions could be answered easily."
- "Patient families 'comparison shop' at times … I think communication by e-mail is one of the things some sophisticated families are looking for when then do their 'shopping'."
- "Allows physicians to answer questions when most convenient, and allows for thoughtful and informed response."

Negative comments were of equal interest to our committee:

- "One problem is that one of my patients is a little nutty and sends me daily five-page e-mails."
- "I know of several patients that would want a long-term e-mail conversation rather than an occasional question."
- "In clinical care by e-mail, you miss the communication from being face-to-face or 'voice-to-voice'."
- "I think that this is a VERY BAD IDEA."
- "My patients are mostly poor; few have e-mail."
- "Patients WILL use e-mail inappropriately. As an example, yesterday, I received a request from a parent to be a reference for her for a health-care job on my home e-mail. Secondly, I care for adolescents, and it is most unnerving when an IM [Instant Message] comes through from SWARM124 or such saying, 'Dr. So-and-so, is that you?'"

Our committee made recommendations to the administration that included extending our pilot program to all clinics with an "opt out" for non-inclined physicians. We emphasized the importance of the triage function, privacy and security, and administrative support. We are currently working with a commercial vendor to assure encryption of messages through an enhanced Web portal and incorporation of the e-mails easily into our electronic medical record. We suspect much current e-mail activity between doctors and patients goes on "under the radar screen" in a HIPAA non-compliant fashion. By continuing to work collaboratively with our patients and our physicians, we hope to evolve a system that will adopt the new technology of clinician-patient e-mail to enhance health. Someday we may even get reimbursed for it. **NCMedJ**

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