

Use of an E-Mail Curbside Consultation Service by Family Physicians

George R. Bergus, MD; Suzanne D. Sinift, MA; Christina S. Randall, PhD;
and David M. Rosenthal, PhD
Iowa City, Iowa

BACKGROUND. Informal (curbside) consultations are central to clinical medicine. Typically, these exchanges between health professionals occur face-to-face or by telephone, but both of these methods can be inefficient. We created an electronic mail (E-mail) service for curbside consultations between family physicians and other health care specialists at an academic medical center.

METHODS. Family physicians had access to the E-mail Consult Service (ECS) from 20 computers at three office practice sites, one hospital, and their personal offices. Informal consults could be obtained from 26 different consultants at the University of Iowa using standard E-mail. Data on the content of the consults and the use of this service were collected and both family physicians and consultants were questioned about their perceptions of the service.

RESULTS. In the 18 months that the service was available, the ECS handled 237 consults. The median response time for a consult by using the service was 16.1 hours. Consultations in the area of adult medicine were the most common, followed by consults in obstetrics and gynecology. Nearly 90% of the consults were about a specific patient, and the majority of the questions were about management issues. Consultants answered 92% of the questions asked by family physicians using the ECS. Family physicians reported that this service was helpful, and most consultants reported that they enjoyed E-mail curbside consults.

CONCLUSIONS. E-mail was successfully used for curbside consults. Both the family physicians and consultants found that an E-mail consultation service could be integrated into their practices.

KEY WORDS. Family practice; electronic mail; computer networks; consultation. (*J Fam Pract* 1998; 47:357-360)

Clinical questions regularly arise during patient care and physicians frequently answer these questions by querying a colleague.^{1,2} Approximately one third of the information needs of family physicians are fulfilled using these informal (or curbside) consults.^{3,5} Physicians report they use this method because colleagues can quickly provide accurate and reliable answers.⁶ The curbside consult is thus central to clinical medicine⁷ and, because the consultant does not interact with the patient, differs from a formal consultation.

Recent prospective studies suggest that curbside consults by telephone with subspecialty physicians are at least as common as the face-to-face variety.^{8,9} Face-to-face curbside consults can be difficult because both physicians need to be in the same place at the same time. The telephone removes this geographic prerequisite but still requires that the two physicians be concurrently available. The telephone also has introduced the time-wasting frustration of leaving a series of messages

as physicians make many unsuccessful attempts to connect by telephone.

Now that computers and digital networks are widely available, electronic mail (E-mail) might be used successfully as a medium for curbside consults. E-mail is relatively fast, dependable, and secure. It also allows people to communicate asynchronously; that is, to communicate without being in the same place or linked to the same system at the same time. There are additional attributes of E-mail that make it attractive for curbside consults. The question and answer can be saved in writing, allowing a physician to retrieve the answer on future occasions without re-asking the question. Additionally, E-mail allows physicians time to reflect on their questions or replies. The time pressure involved with curbside consults has been identified as a source of "incomplete or erroneous" advice.⁷

Recognizing the potential of E-mail, we created an E-mail consult service that linked family physicians with other specialty physicians and health professionals. Our report details the the first 18 months of use of this service. We studied how family physicians used the system, including the types of questions they asked, the consultants' responses to these clinical questions, and the satisfaction of both parties with this type of curbside consult.

Submitted, revised, June 1, 1998.

From the Department of Family Medicine, University of Iowa, Iowa City. Requests for reprints should be addressed to George R. Bergus, MD, the Department of Family Medicine, University of Iowa, Iowa City, IA 52242. E-mail: george-bergus@uiowa.edu

METHODS

Members of the Department of Family Medicine at the University of Iowa deliver care at three free-standing office sites. Two offices are located in an urban area with an aggregate population of 102,000, and one is in a rural town with a population of 1100. Patient care is delivered by 13 board-certified faculty physicians, a physician assistant, and 26 family practice residents.

The E-mail Consult Service (ECS) was initiated in May 1996 with 19 consultants. Consultants were individually recruited and selected because of their medical expertise, routine use of E-mail, and willingness to engage in this trial. Over the next 18 months, the ECS expanded to include a total of 26 consultants in response to requests from family physicians for coverage in additional specialty areas. Residents and faculty in the Department of Family Medicine were introduced to the ECS through presentations, fliers, and pocket cards that contained instructions on how to use the service.

We designed the ECS around standard E-mail. Family physicians could send an E-mail consult request from any of 20 computers located in the patient care offices of the Department of Family Medicine, in the residents' study area, at the hospital, in faculty offices, and on portable computers that were available for loan. Consultants received the E-mail consult queries with the client software they used for their usual E-mail.

Every E-mail question sent between May 1996 and October 1997 was categorized by time and location of its origin, whether it was sent by a faculty or resident family physician, and the specialty area to which it was addressed. The clinical questions contained in each consult were categorized into three broad areas (diagnosis, prognosis, or management) using definitions developed by Sackett and colleagues.¹⁰

At the end of the first year we used both close-ended and open-ended questions to survey consultants about their attitudes and perceptions about the ECS. Faculty family physicians and family practice residents were also surveyed at the end of the first year of the service about their use of the ECS. The data were analyzed using SPSS Version 7.5 (SPSS Corporation, Chicago, Ill). Univariate statistical analyses were carried out using *t* tests or chi-squared tests, as appropriate, with an alpha of 0.05.

RESULTS

During the first 18 months of the ECS, members of the Department of Family Medicine sent 241 E-mail consult requests. Four of the requests were never answered, leaving 237 completed consults available for study. These 237 consults contained a total of 328 questions.

Slightly more than half of the consult questions were sent to subspecialists in adult medicine. The obstetrics

and gynecology consultants were the next most queried. Details about the specific specialty areas of the consults are shown in the Table. Faculty and resident family physicians were each responsible for approximately half of the consult requests. During the study period, these two groups saw approximately the same number of patients in the Department of Family Medicine.

One third of the requests for E-mail consults originated from a computer in the residents' study area, almost 30% came from computers in faculty offices, a quarter were from a computer in the main patient-care office, 6% came from a computer in the rural satellite office, 3% from the computer in the hospital, and 2% originated from a portable computer loaned out to residents. Eighty-five percent of the consults were requested during working hours (8:00 AM to 5:30 PM), and 9% were sent in the evening between 5:30 PM and 10:00 PM.

The turnaround time of the consults was fairly rapid, with a median response time of 16.1 hours. Fifty-nine percent of the consults were answered within 24 hours and 86% were answered within 5 days. Approximately 80% of the consults were answered during working hours.

Faculty and resident family physicians asked a mean of 1.5 questions per consult. Questions about management were the most frequent (51%), followed by questions about diagnosis (43%) and prognosis (6%). Eighty-eight percent of the questions were about a specific patient while the remainder of the questions were more general in nature. The consultants provided answers to

TABLE

Consultants, by Specialty, Who Received E-Mail Consult Requests During the First 18 Months of the E-Mail Consult Service (N=237)

Specialty*	Number of Consults	Percent
Adult Medicine	126	53.1
Obstetrics and Gynecology	60	25.3
Pediatrics	12	5.1
Surgery	30	12.7
Other	9	3.8

*Adult Medicine included specialists in cardiology, endocrinology, gastroenterology, hematology, infectious disease, lipids, neurology, oncology, pulmonary, and rheumatology; Obstetrics and Gynecology included cervical cytology/disease, and uro-gynecology; Pediatrics included neonatology, infectious disease, and general pediatrics; Surgery included general surgery, ophthalmology, orthopedics, otolaryngology, vascular surgery, and urology; and Other included dermatology, travel medicine, pharmacology, and laboratory medicine.

92% of the questions posed through the ECS; in the remaining 8% the consultant either asked for additional information or a formal consultation. Overall, consultants suggested a formal consultation in response to 14% of the E-mail consults.

Twenty-four of 26 consultants responded to our survey after the first year of the ECS. Twenty-three consultants reported that the ECS was easily integrated into their daily schedule, but eight reported that the ECS had increased their workload. Twenty consultants reported that they enjoyed being involved with this project and 17 felt that the service enhanced their teaching role.

One consultant reported that the ECS increased her personal referrals from family physicians and two felt that their involvement increased referrals to their department. Sixteen consultants reported that although the service did not increase their referrals, they felt that their involvement enhanced their communication with primary care physicians.

The consultants did have concerns about the ECS. Eight consultants identified the lack of follow-up information as the least satisfying aspect of the ECS. Overall, only two consultants reported that they had ever received follow-up on a patient about whom they were consulted, although nearly all (22 of 24) consultants reported that they would have appreciated this information. One quarter of the consultants were concerned that their participation in the ECS increased their legal liability exposure.

Eleven of 13 faculty family physicians responded to our survey about the ECS. Eight reported that they had made use of the ECS, although they reported that they were more likely to obtain curbside consults using the telephone or face-to-face meetings. Seven of the eight faculty users reported that the service was easy to use, six felt that the ECS was convenient and did away with trading phone messages with a consultant, five reported that they enjoyed using E-mail for consults, and four reported that they used the ECS because they preferred getting a written answer to their questions. All of the faculty members who had made use of the service reported that the E-mail consults had been helpful to them. In response to an open-ended question about why the ECS had been helpful, one user reported that he liked the short, concise answers he received to his questions and the easy access to the ECS from multiple clinical sites. Another user reported that she found the ECS forced the consultant to commit to an answer and that she now uses her own E-mail to contact other physicians for answers to clinical questions.

The three faculty physicians who never used the ECS all reported that they used E-mail for other business. One each reported that they had not used the service because it seemed impersonal, they did not know the consultants, and they did not know how to use the service. Two reported that they had not used the service because it was not part of their routine.

DISCUSSION

Although the ECS did not become the primary means for informal consults, its users found it to be a useful resource. The questions that family physicians asked on the ECS were congruous with the types of questions that have been found to arise most frequently in practice. The majority of questions were about patient management, which is consistent with observational studies of physicians in office practices.^{4,11,12} Additionally, slightly more than half of the E-mail consults were directed to adult medicine consultants, with the next most common area being obstetrics and gynecology. Questions in these two areas were most frequently recorded during an observational study of family physicians.¹³

Our data show how E-mail was integrated into the process of clinical care. Most of the consults were sent during the work day and originated from computers in faculty offices or the residents' study area. This suggests that many of the E-mail consult requests were not sent at the same time as the patient care was delivered, but while the physicians were completing charts from an earlier session.

The consultants reported that they easily integrated the ECS activity into their daily routine, and most reported that they enjoyed this clinical exchange with family physicians. Liability exposure was a common concern but did not prevent any consultant from participating in this project. We are not aware of any of the consultants being involved in litigation because of their activity with the ECS, although the small number of E-mail consults per consultant limited their exposure. The extent to which the ECS exposes consultants to liability remains unclear. A recent commentary about curbside consults reported that there has not been a successful lawsuit brought against a curbside consultant.⁷ Two separate medicolegal reviews suggest that courts typically shield curbside consultants from liability because most of these consults do not give rise to a physician-patient relationship.^{14,15}

Our project found that it was possible to establish an E-mail system for curbside consults, but we have not yet demonstrated the clinical utility or the cost-effectiveness of the service. We used inexpensive software installed on pre-existing computers but still incurred the expense of weekly maintenance checks and troubleshooting. Additionally, the ECS required an investment of instructional time for primary care physicians. In a cost-analysis we would also have to account for the donated time of our consultants, although curbside consults are generally supplied at no cost to the primary care physicians. From the consultants' perspective, E-mail consults might be handled at a lower opportunity cost than face-to-face or telephone consults because E-mail consult requests from the family physicians arrived among their usual E-mail messages and could be answered at the convenience of the consultant.

The ECS also may offer more advantages than improved clinical outcomes or lower costs. The system could be an effective means of transmitting new clinical knowledge compared with conventional continuing medical education, because information is delivered to the primary care physician when it is needed.¹⁶ Consultation by means of the ECS may also supply the psychological support, affirmation, and empathy that physicians often seek under the guise of soliciting information from a colleague.¹

In designing our system we chose not to emulate previous sophisticated telemedicine projects which have used synchronous teleconferencing to supplement the information needs of primary care physicians.^{17,18} Although projects using more advanced technology have been successful, we desired a technically simpler, asynchronous system so that physicians could access the ECS from any personal computer with a modem.¹⁹ We are aware of other family physicians who use E-mail to contact colleagues for advice²⁰ and use E-mail discussion groups to request help for a clinical problem.²¹ The ECS differs from these previous uses of E-mail because the ECS is a closed, formal system consisting of expert consultants recruited specifically to respond to clinical questions from primary care physicians.

CONCLUSIONS

We found that our E-mail system was used by most family physicians for curbside consults. Both the family physicians and the consultants found the E-mail-based system to be easy and enjoyable to use. A next step is to better understand the barriers that prevent some family physicians from using the ECS for consults. Finally, a consistent complaint from our consultants was that they rarely received feedback about the patients after the consult. We believe that providing follow-up information will sustain consultants' satisfaction with the ECS and might be central to building a collegial relationship between those who consult using E-mail.

ACKNOWLEDGMENTS

This work was supported in part by US PHS Grant for Graduate Training #1 5D15PE10299.

The authors thank the consultants who generously donated their time and energy to this project and the members of the Department of Family Medicine who were willing to use the ECS as a new tool to support their delivery of health care.

REFERENCES

- Smith R. What clinical information do doctors need? *BMJ* 1996; 313:1062-8.
- Hang JD. Physicians' preferences for information sources: a meta-analytic study. *Bull Med Lib Assoc* 1997; 85:223-32.
- Gruppen LD, Wolf FM, Van Voorhees CV, Stross JK. Information-seeking strategies and differences among primary care physicians. *Mobius* 1987; 7:18-26.
- Ely JW, Burch RJ, Vinson DC. The information needs of family physicians: case specific clinical questions. *J Fam Pract* 1992; 25:265-9.
- Gorman PN, Ash J, Wykoff L. Can primary care physicians' questions be answered using the medical journal literature? *Bull Med Lib Assoc* 1994; 82:140-6.
- Dee C, Blazek R. Information needs of the rural physician: a descriptive study. *Bull Med Lib Assoc* 1993; 81:259-64.
- Manian FA, Janssen DA. Curbside consultations. A closer look at a common practice. *JAMA* 1996; 275:145-6.
- Manian FA, McKinsey DS. A prospective study of 2,092 "curbside" questions asked of two infectious disease consultants in private practice in the Midwest. *Clin Infect Dis* 1996; 22:303-7.
- Magnussen CR. Infectious disease curbside consultations at a community hospital. *Infect Dis Clin Pract* 1992; 6:391-4.
- Sackett DL, Richardson WS, Rosenberg W, Haynes RB. *Evidence based medicine: how to practice and teach EBM*. London: Churchill Livingstone, 1997.
- Bowden VM, Kromer ME, Tobia RC. Assessment of physicians' information needs in five Texas counties. *Bull Med Lib Assoc* 1994; 82:189-96.
- Covell DG, Uman GC, Manning PR. Information needs in office practice: are they being met? *Ann Intern Med* 1985; 103:596-9.
- Chambliss ML, Conley J. Answering clinical questions. *J Fam Pract* 1996; 43:140-4.
- Stratton WT. Informal consultations. *Kansas Med* 1988; 89:66,80.
- Fox BC, Siegel ML, Weinstein RA. "Curbside" consultation and informal communication in medical practice: a medicolegal perspective. *Clin Infect Dis* 1996; 23:616-22.
- Wyatt JC. Commentary: telemedicine trails—clinical pull or technology push? *BMJ* 1997; 313:1879-81.
- Harrison R, Clayton W, Wallace P. Can telemedicine be used to improve communication between primary and secondary care? *BMJ* 1996; 313:1377-81.
- Sanders JH, Tedesco FJ. Telemedicine: bringing medical care to isolated communities. *J Med Assoc Ga* 1993; 82:237-41.
- Hassol A, Gaumer G, Irvin C, et al. Rural telemedicine data/image transfer methods and purposes of interactive video sessions. *J Am Med Inform Assoc* 1997; 4:36-7.
- Geddes JA. Consultation and counselling via e-mail. *Can Med Assoc J* 1997; 156:484-5.
- Bolster A. CMA's Clinical Q&A discussion group offers corridor consultations on the Internet. *Can Med Assoc J* 1996; 155:316-7.