couraged to include the cost of the examination in their financial-aid calculations in order to offset the expense for students.

Nonetheless, the AMSA continues to oppose the examination. In November 2003, in an effort to address the remaining concerns, the AMA sent a letter to the deans of medical schools encouraging them to ensure that there is an appropriate emphasis on clinical-skills training in the curriculum and to develop mechanisms for assisting students in meeting the costs of the examination. The letter also discouraged schools from making passage of the examination a requirement for graduation for at least five years after it is implemented.

In spite of the controversy, many of us who are involved in medical education believe that implementing the clinical-skills examination is the right thing to do. The success of the examination will depend on the ability of medical schools and students to overcome the logistic barriers, and the road will surely be bumpy. But the reality is that licensure represents a public trust in the physician's skills. In this era of increased professional accountability, how can the licensure process not include proof of clinical skills? The implementation of the Step 2 clinical-skills examination makes explicit to medical schools the importance of these skills. It is likely to drive curricular reform toward better instruction and assessment of clinical skills, and that may be the test's most enduring benefit. After all, we all study for what's on the test.

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Electrons in Flight — E-Mail between Doctors and Patients

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> Phones seem antagonistic these days, [and] I'm not sure I can process health stuff that quickly. With e-mail I can address issues when I have the mental space. I have time to think and shape the question and keep a file. And my doctor . . . helps me think things through. He has really gotten to know me and my evolving circumstance.
>
> — *A patient in our practice*

Alexander Graham Bell invented the telephone in 1876, and within decades it was impossible to imagine society without it. E-mail emerged in the early 1970s, and today about 100 million Americans send and receive e-mail. Half of them use "instant messaging,"[1] and with the rise of wireless messaging technology, the distinction between telephones and e-mail is rapidly blurring.

Virtually all patients have had difficulty reaching their doctors by telephone, and many have given up trying. E-mail promises better access, and half of Internet users would like to communicate with a doctor online.[2] Of these, half claim that this opportunity would influence their choice of a doctor. In contrast, several surveys indicate that about a quarter of practicing doctors have communicated with a patient by e-mail, but few encourage such practice as a matter of course. For doctors, at a time of disquiet, fatigue, and bombardment by paper and electronic "noise," even if e-mail improves the quality of communication with patients, it threatens to break the camel's back.

Conventional e-mail is the most comfortable and common form of electronic communication. It is inexpensive, or even free, and personal and work-related messages arrive at the same place. However, it is unstructured and poorly designed for using forms

for referrals and prescription renewals or for routing messages automatically. Lacking encryption, messages can be intercepted and read by prying eyes. And transferring messages into the patient's medical record can be awkward and time-consuming.

Secure messaging portals address some of these disadvantages. Enmeshed in the World Wide Web, these sites provide security through technology similar to that used by other industries. They facilitate structured communication and the triage and broadcasting of messages, and they increasingly permit merging with electronic health records. Helped also by growing interoperability among computers, in some applications patients can review their medications and correct errors; request prescription refills; make appointments; retrieve laboratory results; view their mammograms, magnetic resonance images, and endoscopies; and study educational materials forwarded by their clinicians. Patients can provide structured histories, enroll in computer-assisted programs to manage disease, and, in some pilot efforts, review their doctors' notes.

Urged on recently by the American Medical Association and the American College of Physicians, insurers and health plans are exploring ways to pay doctors for using e-mail, whether by the message or the episode of illness or through an annual per-patient or global practice fee. They are also experimenting with various approaches to cost sharing. Early experiences suggest that e-mail interchange may offset costs incurred by telephone calls, missed or avoidable appointments, medication errors, and requests for prescriptions. However, doctors remain unconvinced about such tradeoffs. Two thirds of doctors say that they would use e-mail, but only if they were paid for the time involved.[3]

By its very nature, e-mail becomes part of the written record. As a result, guidelines have been promulgated[4] suggesting, for example, that doctors and patients who have not yet met one another avoid discussing clinical issues by e-mail. Similarly, the use of standard disclaimers about response time may protect clinicians from lawsuits over unanswered urgent e-mail. Our guess is that guidelines and evolving customs will make e-mail communication less subject to punishment than are poorly documented telephone conversations, errors of omission or commission in the doctor's office, or notes in the medical record.

Surely, electronic communication is bound to proliferate. First engaging those who can afford and manage new technology, it is transforming personal lives and spreading throughout every industry and organization. As health care joins in this evolution, we think the future will look something like this: sitting in front of computer screens with video cameras attached, patients and doctors will converse or leave messages. The doctor will examine a rash, monitor an electrocardiogram, or assess the patient's affect. Voice-recognition programs (long reported to be "just around the corner," but now rapidly nearing the intersection) will transcribe all communications, including interactions in the doctor's office, into an electronic medical record shared by doctors and patients. For patients, complex medical language in doctors' notes will link automatically to explanations. Other links will lead to educational material relevant to a given diagnosis, medication, or test. Patients and doctors will respond to one another's notes, offering elaborations and corrections. Doctors will distribute reminders about preventive measures and gather organized feedback from their patients. Patients will prepare, rank order, and forward questions for their next virtual or actual encounter. When needed, computer programs will translate notes and messages from and into a patient's native language. Patients will also exchange many more telephone calls with their doctors, as both become inseparable from digital telephones. When one cannot reach the other, voice recognition will transcribe messages and send e-mail that may arrive on a mobile device (see Table).

Electronic messaging will pose difficult challenges as it transforms the traditional roles of doctors and patients. What if a patient sends too many or inappropriate e-mails? What if a patient reads a report of a new cancer before hearing about it from a doctor or reads and disagrees with the doctor's notes? What will all this mean for broader aspects of doctor–patient relationships? Some have little interest in such technology, and others find it dehumanizing, distancing doctors from patients. Some, however, embrace it as ideal for promoting shared decision making and establishing safer and more efficient practice.

As electronic communication evolves, we suggest strongly that patients, doctors, and other health professionals join in creating and evaluating new portals, record systems, and practice guidelines that delineate shared expectations, modulated when necessary by explicit agreements between individual patients and doctors. We should learn also from online merchants, auctioneers, and bankers whose

Table. Electronic Patient–Doctor Communication.

Current Attributes			Future Evolution
Telephone	Conventional E-Mail	Secure Messaging	
Synchronous	Asynchronous	Asynchronous	Secure synchronous and asynchronous, sometimes substituting for personal encounters
Almost universally accessible	Increasingly accessible	Not yet widely available	Integrated with patient-controlled personal health record
Highlights vocal expression and nuance; lacks visual and written content	Encourages informal, written expression; lacks aural and visual content	Encourages informal, written expression; lacks aural and visual content	Video conferencing and messaging
Good for urgent communication	Not good for urgent communication	Not good for urgent communication	Instant voice transcription into written record
Not automatically documented in records	Self-documenting	Self-documenting; readily linked to electronic records	Full patient access to notes and reports
Messages may be heard by others; call triage can be automated through menus	Susceptible to interception; messages manually routed to others	Secure; automated forwarding to professionals and support staff	Automated access to medical glossaries
Rarely reimbursed	Reimbursed by some payers	Reimbursed by some payers	Translation into different languages
		Platform for reminders, questionnaires, medication refills, appointments, test results, educational material	Connectivity to multiple data sources
			Incorporation of multimedia educational material
			Data from home-based diagnostic technology sent to clinicians

triage systems handle vast numbers of interactions without free-text e-mail exchange, reserving that for circumstances best served by communication between two people. Such portals can be designed to seem personal and welcoming, while controlling costs and ensuring confidentiality.

E-mail is qualitatively different from all other forms of communication. It breeds informality and spawns new shorthand. It encourages short messages, permits rapid-fire interchange, and facilitates leisurely intercourse. Judging from our early experience in a practice that offers secure electronic communication, e-mail gives doctors and patients more time to think. Doctors and patients move closer together, and trust grows strikingly. Interchange becomes more personal, and office visits seem more efficient and less emotionally charged. And with time "offline" to reflect and learn, patients appear to be better able to grasp information that is central to their care. Indeed, one of our patients told us, "Exchanges by e-mail are the next best thing to a house call."

In 1998, an international group of laypeople and health professionals met to envision a more patient-friendly health care system — one created "through the patient's eyes."[5] They agreed quickly on a guiding principle — "Nothing about me without me." Electronic communication will move medicine inexorably toward such transparency, enabling doctors and patients to share knowledge, responsibility, and decision making more equally. We need to explore rapidly how this change will affect the quality of care for patients, and the quality of life for doctors. As we shape and harness change, recall fair warning from Alexander Graham Bell: "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."

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