
PATIENTS, PHYSICIANS, AND THE INTERNET

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The Internet can be a powerful tool for enhancing the quality of health care and providing expanded access to health care services to a greater number of patients [1-6]. It offers unprecedented access to clinical information and can enable physicians to communicate more efficiently with patients, colleagues, office staff, other health care facilities, and health plans. In addition, many medical Web sites offer specific, personal medical care and advice, acting as online health care providers to existing patients and to strangers (ie, "e-consultation").

Using electronic health care technologies, however, involves risks. The Internet is an unregulated, global community. Virtually anyone, anywhere, can post information for any purpose on the Web. Even if the individual or organization is not professionally qualified to do so, they may offer medical care and advice via the Web [6,7]. As health-related Web sites and services become more common and patients increasingly seek health care information and services online, physicians and patients are justifiably concerned about the Internet's influence on health care. The issues at stake include the quality of health information and services, threats to user privacy (eg, third party access to patients' health information), and the business and professional behavior of health-related Web sites [1,2,6-8].

Physicians thus face several questions in deciding whether and to what extent they will use online technologies in their practices: Am I comfortable using the Internet? Does my practice have the resources (eg, adequate computer hardware and software, appropriately trained office staff, computer support staff) to use the Web effectively? Do the institutions I work with have policies that will affect how I can use the Web? How can I use online tools responsibly in caring for patients?

The Internet does not change health care providers' ethical and professional obligations to serve patients' well-being and protect their privacy and the confidentiality of their medical information, but it does present new chal-

lenges to fulfilling those obligations. This article explores concerns that physicians and their patients face regarding how to use Web-based health information, electronic mail (e-mail), and e-consultation wisely.

Health Information on the Web

Beyond clinicians' use of the Web as a tool to support evidence-based practice [9,10], patients may use Web-based information to enhance their interactions with physicians and to become more knowledgeable partners in managing their own health [5,11,12]. Patients can readily access the clinical information available to health care professionals, and through online support groups, chat rooms, and listservs they can draw on the experience of other patients to form a richer understanding of a particular health condition or course of therapy [13].

Patients consult the many Web sites that offer disease- and condition-specific information for a variety of reasons. They may search for answers to health care questions prior to or instead of consulting their physicians, for example, or in hope of finding alternatives when conventional therapy is not available or offers only limited benefit. Raw information is rarely helpful to patients, however, and they must be educated to use it responsibly to make informed health care choices [14,15].

Consider the following scenario, which presents 1 of the ways in which a physician may be challenged to respond to patients who use the Web as a source of health care information:

Stella Anderson was recently diagnosed with pancreatic cancer at age 63. She is not eligible for surgery because of liver metastases. Stella's adult daughter Ellen accompanies her to the oncology clinic to discuss available therapies and the plan of care with Dr. Overbeck, Stella's oncologist. Dr. Overbeck explains that metastatic pancreatic cancer may respond to chemotherapy and is an option for some patients. Other patients prefer palliative care, which is not accompanied by the serious complications and side effects of chemotherapy. Dr. Overbeck assures them that Stella will receive the best care available in the community, but gently cautions them that Stella's overall prognosis is poor.

Ellen recently researched her mother's condition and treatment options on the Web. She found several

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Table 1. Guidelines for Assessing Health-Related Web Sites

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- Does the site clearly disclose its sponsorship and purpose?
 - Does the site explain how its content is developed and clearly indicate the source(s) on which content is based?
 - Is the site's content easy to find and read?
 - Does the site clearly distinguish advertising from other content?
 - Does the site indicate when hyperlinks will take visitors to another Web site?
 - Does the site explain whether and what data is gathered from visitors? Does the site seek visitors' informed consent to gather and use data in these ways?
 - Does the site have a clear policy regarding user privacy and the confidentiality of personal information?
 - If the site provides personal medical advice, does it assure that the advice is offered by a qualified health care professional? Does it clearly indicate a turn-around time for responses to inquiries?
 - Does the site make it easy for visitors to lodge complaints? Does it inform them how complaints will be addressed?
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Data from eHealth Ethics Initiative. eHealth code of ethics. Available at: www.ihealthcoalition.org/ethics/ehcode.html; Health on the Net Foundation. HON code of conduct (HONcode) for medical and health Web sites. Available at: www.hon.ch/HONcode/Conduct.html; and Health Internet Ethics. Ethical principles for offering Internet health services to consumers. Available at: www.hiethics.org/Principles/index.asp.

conflicting reports on the use of autologous bone marrow transplants (ABMT) for pancreatic cancer, with some centers offering the procedure as a last hope for patients. She also discovered a physician who treats patients with high-dose vitamin and herbal extract therapies and who claims to have excellent results in patients with advanced cancer. Ellen asks Dr. Overbeck to explain these treatment options and wonders why they should not be considered for her mother.

Dr. Overbeck is highly suspicious of the Web site promoting use of vitamin and herbal therapies. He also is aware of recent studies showing a lack of efficacy for ABMT but understands the need for hope in cases such as Stella's. Ellen's research, however, means that Dr. Overbeck will not be able to use the remaining appointment time to explore Stella's concerns and values, develop an appropriate plan of care, and make arrangements for her treatment—he must now quickly appraise the Internet material and explain to Stella and Ellen why such treatments are not suitable options.

As this case suggests, the Internet may make fulfilling the obligation to guide patients in making

thoughtful health care decisions more complex. Patients may present physicians with a wide range of information, including suggestions from unmoderated chat room discussions; peer-reviewed content sponsored by professional and/or governmental organizations; reports of successful treatment with unproved, unstudied therapies or with off-indication uses of legitimate therapies; and educational content that may be biased by a commercial sponsor's desire to promote a particular product. Thus, there are significant concerns about the quality of health information and services available through the Internet [6,7,14–19].

Using Web-Based Information Effectively

Nonetheless, the Web can enhance a physician's practice if he or she helps to educate patients about using online resources responsibly. Consider the following scenario in which a physician helps lead a patient to useful information on the Web:

Dr. Jenkins scans his list of morning appointments and notes that Mrs. Moyes is scheduled for a follow-up appointment. She has moderately advanced Alzheimer's disease and will be accompanied by her adult daughters. Mrs. Moyes still lives in her own home, but her daughters and Dr. Jenkins are becoming concerned about the appropriateness of this arrangement.

During the appointment, the daughters ask many questions about Alzheimer's disease, including the prognosis, treatment options, community services, need for home nursing care, options for nursing homes, and issues of competency for Mrs. Moyes. Dr. Jenkins discusses the issues carefully with the family, reviewing his goals of maintaining a safe and dignified home setting for Mrs. Moyes as long as feasible. He also refers the daughters to an Alzheimer's disease Web site established by a leading medical school, which contains information for patients, caregivers, and clinicians. Dr. Jenkins explains clues to look for in a Web site to determine whether the site provides quality information (Table 1).

One of Mrs. Moyes' daughters calls the following week to thank Dr. Jenkins for his advice, telling him that she found a wealth of helpful material on the Web. She also found a link to the local Alzheimer's disease chapter and has begun volunteering regularly for the group.

As this scenario illustrates, physicians can enhance their practices by educating patients about using online resources responsibly (eg, to answer commonly asked questions about diseases and medical conditions). Some physicians may be tempted to dismiss the Web as a source of information and support for patients, however, a strategy that may be both impractical and potentially

Table 2. Guidelines and Codes of Ethics for Using the Internet in Health Care

Guideline/Code	Source	Internet Address	Description
eHealth Code of Ethics	eHealth Ethics Initiative	www.ihealthcoalition.org/ethics/ehcode.html	Identifies values challenged by using the Internet in health care. Provides principles for ethical conduct to guide the development, management, and use of health-related sites and services.
HON Code of Conduct (HONcode) for Medical and Health Web Sites	Health On the Net Foundation	www.hon.ch/Conduct.html	Describes concrete principles of responsible conduct for health-related Web sites and provides checklist (HONcode Site-Checker) to help users make informed judgments about a site's services and credibility. Sites that subscribe to and uphold HONcode may display the HONcode seal.
Ethical Principles for Offering Internet Health Services to Consumers	Health Internet Ethics	www.hiethics.org/Principles/index.asp	Provides rules of conduct for for-profit, commercial Web sites that offer health-related information, products, or services. Includes guidelines regarding user privacy, site content, and conflicts of interest.
Guidelines for Medical and Health Information Sites on the Internet	American Medical Association	www.ama-assn.org/about/guidelines.htm	Offers detailed rules governing the design, content, and operation of AMA-affiliated Web sites, including guidelines for quality of content, privacy, and conflicts of interest.
Guidelines for the Clinical Use of Electronic Mail with Patients	American Medical Association	www.amia.org/pubs/pospaper/positio2.htm	Proposes guidelines for clinical use of e-mail between patients and physicians who have ongoing, face-to-face relationships. Includes specific recommendations regarding appropriate use of e-mail, protocols for managing messages, and protecting privacy and confidentiality.
ISMHO/PSI Suggested Principles for the Online Provision of Mental Health Services	International Society for Mental Health Online/Psychiatric Society for Informatics	www.ismho.org/suggestions.html	Suggests guidelines for providing responsible online mental health services, including information that should be provided to prospective clients prior to initiating a therapeutic relationship, requirements and procedures for online counseling, and the need for protecting privacy.

professionally irresponsible. Survey data suggest that most patients prefer to receive health and medical information from their own physicians, even as they seek to use the Internet to become better educated [11]. Physicians who ignore the importance of the Internet in health care, or who insist that patients only visit Web sites they recommend, risk alienating patients or motivating them to seek more accommodating physicians [6,10].

As patients gain greater access to health care information, much of which is highly technical, physicians are obligated to help them learn to assess its quality and understand its implications for their own health care decisions. Responsible sites can help physicians educate patients and their families about prognosis, treatment options, and available community resources. Several recent initiatives to develop voluntary standards for the

“health Internet” provide guidance to help physicians and patients assess the reliability of sites and the quality of Web-based information (Table 2) [20–25]. In particular, the eHealth Code of Ethics [20] and HONcode [21] identify the principles and practices that characterize responsible, trustworthy sites and services. The goal of these codes is not to dictate what information a site should provide, or to specify which sources a site should use in developing content. Rather, the goal is to provide tools to guide users in making informed decisions about whether to trust a site. The principles of these codes help define general questions that physicians and patients can use to evaluate health-related Web sites (Table 1).

Creative responses to the challenge of educating patients as users of the health Internet can be tailored to a practice’s resources and the needs of its patient population.

Table 3. Qualities of E-Mail Communication

Advantages

- Is technologically simple and easy to use
- Is asynchronous
- Can overcome obstacles to efficient communication (eg, "phone tag," lost or garbled messages)
- Allows text and image files to be attached and transmitted
- Encourages patient candor
- Allows for detailed communication (eg, instructions for follow-up care)
- Can easily be incorporated into the medical record
- Can be used to manage routine communication efficiently (eg, appointment scheduling, laboratory results)

Disadvantages

- Poses hazards to patient privacy and the confidentiality of personal medical information (eg, third-party access and data gathering)
 - May contain inappropriate content (eg, urgent care issues, abnormal or confusing test results, "bad news," information regarding sensitive health topics)
 - May contain messages of poor quality (eg, inappropriate level of sophistication for intended recipient)
 - Is potentially discriminatory (eg, favors patients who are literate, can communicate in writing, and have access to the Internet)
 - May result in a burdensome volume of messages
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A simple, easy-to-read brochure outlining the questions listed in Table 1 can provide valuable guidance for patients who use the Web for health-related purposes. Or, a computer with Internet access might be made available to patients to use in the office, with support from the practice nurse or other staff [6]. Ideally, physicians would have the time to go online with patients to research specific questions that arise during an office visit. Patients would not only "learn by doing" and retrieve valuable information, but their physicians also would be able to have confidence in the quality of that information. Alternatively, practices that maintain their own Web sites can post guidelines for patients to use and provide links to helpful sites or services, in addition to offering information about the practice itself and serving as a communication channel between patient and physician [26].

E-Mail Communication

Advantages and Disadvantages

E-mail can facilitate a wide range of communication in clinical practice, and it can overcome some of the obstacles encountered with communicating by telephone and

mail (Table 3) [1,22]. In addition, patients who are comfortable using e-mail may be more candid and forthcoming when exchanging e-mail with their physicians than they are in face-to-face conversations [5]. The absence of voice cues, facial expression, or body language can make patients more comfortable communicating via e-mail. Furthermore, e-mail messages can become part of the medical record, whether they are printed and included in a patient's paper records or incorporated directly into an electronic medical record [2,3,6]. Even deleted messages later can be retrieved and filed.

E-mail is not without disadvantages, however, and concerns about privacy and the confidentiality of digitally transmitted information are prominent for both patients and physicians [1-3,6,20,22]. The privacy of electronic communication is vulnerable in various ways. For example, unencrypted e-mail messages that are left open on screens can be read by others in the practice office or patient's environment (eg, office staff, family members, coworkers). Likewise, network administrators, Internet service providers, and other third parties along the line of transmission may have access to unencrypted messages, with or without the knowledge of patient or physician [1,2,22,27].

Communicating Clearly

Physicians who use e-mail with patients must attend carefully to the quality of their own messages [1,22]. Messages must be well focused and succinct, yet compendious enough to convey necessary information. Just as physicians should present verbal or other written information in ways that patients can understand, e-mail messages also must be clearly written at an appropriate reading level. Finally, messages should be formatted to enhance information, such as by using bullet points to highlight important content [28].

Consider the following scenario involving a 38-year-old patient with metastatic breast cancer [29]. The patient has received high-dose chemotherapy followed by a bone marrow stem-cell transplant after almost 3 years of continuous disease and multiple treatments. Several months following the conclusion of her therapy, a routine computed tomography (CT) scan reveals what appears to the transplant oncologist to be recurrent cancer in the spine. He sends the following e-mail to the patient, her radiation oncologist, and the chief of the breast service at the patient's health care facility:

Subject: CT scan 11-12-99

This is a CONFIDENTIAL medical communication.

Dear Olga, Cheryl, and Jimmy:

Attached are the relevant bone window and formal

Table 4. American Medical Informatics Association Guidelines for the Use of E-Mail in Medical Practice

- Establish turn-around time for response to patient messages appropriate to the nature of the patient's inquiry.
- Inform patient about privacy issues (ie, others will process messages, e-mail addresses will be shared with others under certain circumstances, messages become part of the medical record).
- Establish types of permissible transactions (eg, non-urgent medical advice, prescription refills, scheduling appointments, test results, billing questions).
- Establish permissible content of messages, and establish a policy for sensitive topics (eg, HIV/AIDS, mental health).
- Use discreet and categorical subject headers in the "Subject" line of messages (eg, medical advice, prescription).
- Instruct patients to include their name and patient identification number in the body of their messages.
- Configure automatic reply to acknowledge receipt of patient messages, including anticipated response time and "out of office" replies when messages will not be processed within the proposed turn-around time.
- Archive e-mail transactions (ie, print a copy of the reply with full text of patient's original message and include in the patient's paper records or copy reply with original message to electronic medical record).
- Confirm action taken in response to message.
- Instruct patients to acknowledge replies containing important information, and archive patient acknowledgment to chart or electronic medical record.
- Invite patients to "escalate" to telephone conversation or office visit when they believe that e-mail communication is not sufficient.
- Maintain an electronic address book of patient e-mail addresses.
- Use "Blind cc" option when sending group message to general patient population to protect patient confidentiality (ie, message should be sent "To" the provider's e-mail address with recipient addresses placed in the "Blind cc" field).
- Use restrained language when replying to patient messages (ie, avoid anger, sarcasm, inappropriate references to third parties).

Adapted with permission from Kane B, Sands DZ. Guidelines for the clinical use of electronic mail with patients. The AMIA Internet Working Group, Task Force on Guidelines for the Use of Clinic-Patient Electronic Mail. *J Am Med Inform Assoc* 1998;5:104-11. Available at: www.amia.org/pubs/pospaper/positio2.htm. Accessed 10 Aug 2000.

reading from Olga's 11-12-99 CT scan demonstrating the new sclerotic focus in the left pedicle of L₂. I have circled it in red. It looks real to me, and I would have Cheryl buzz that area.

Hope all is well with the three of you. Talk to you soon.

Sincerely,
Ed

Is this an appropriately constructed message? For this patient, it is, because she has a long-standing therapeutic relationship with the sender and other recipients and has acquired considerable sophistication regarding her condition during 3 years of treatment. The e-mail has been sent simultaneously to the patient and her primary caregivers, so they can readily discuss the implications of the new information. It also has been marked appropriately as a confidential communication, as recommended in the e-mail guidelines of the American Medical Informatics Association (**Table 4**) [22].

However, to send a similarly terse, highly technical message to a patient such as Stella Anderson and her daughter in the first scenario would not be appropriate. A patient such as Stella, who is just beginning her ther-

apy, is far less likely to understand the technical language or the implications of the information for her care and prognosis. In such cases, physicians should meet with their patients face-to-face, so that they may describe the clinical findings in lay terms, explain clearly and compassionately what the information means, and support patients and their families in understanding and coping with those implications [1,22].

Establishing Guidelines for Patients

For e-mail to be an effective tool for communication, physicians must help patients use the medium responsibly. Patients must understand when and how to communicate by e-mail [1,22]. For example, patients may not understand the dangers of using e-mail to communicate information regarding signs and symptoms of potentially serious conditions. In the following scenario, a physician returns to her office on Monday morning to receive an e-mail from a patient dated Saturday evening:

Dr. Brady:
I am writing from Los Angeles. I flew out here yesterday

for a convention. I noticed that my left calf is now swollen and sore. Is this anything to worry about?

Thanks,
Dan Vincent

Several features of this message are troubling. First, the patient sent a message describing a potentially serious condition without knowing when Dr. Brady would actually receive it. Dr. Brady should be concerned that her patient may have developed a deep venous thrombosis—or even pulmonary embolism—after a long plane flight. Second, the patient's e-mail does not include information regarding where he is staying, which convention he is attending, or how he can be contacted. Despite this difficulty, Dr. Brady should do her best to track down her patient, given the serious complications that may develop.

Establishing written policies about e-mail communications with patients, including policies about communicating with physician and nonphysician office staff can help to avoid such problems. Patients should understand what types of clinical and administrative questions can be addressed via e-mail, what kinds of information they should provide to help clinicians address their needs, and when to expect answers to their questions (Table 4).

A well-designed practice Web site that guides patients in communicating with the office (ie, through a menu of options, query forms, or similar strategies) may be the best way to assure that incoming patient messages are directed to appropriate staff members and provide the information physicians or staff need to respond to the patient's inquiry [1]. Maintaining an office Web site can involve a significant commitment of time and resources, however, and may not be feasible [26,30]. If an office Web site is not practicable, it is even more important for physicians to provide clear, ideally written, instructions to patients who wish to communicate by e-mail [1,22].

E-Consultation

Health-related Web sites have the potential to be a valuable resource for patients seeking specific, personalized information about health concerns. E-consultation, which often occurs between health care professionals and patients who have no previous relationship, may play an increasingly significant role in clinical practice.

For example, a pilot program at the University of Virginia Children's Medical Center that offered e-consultation for pediatric gastroenterology received 1239 inquiries during a 33-month period [31]. Of those

inquiries, none was from patients or families with a prior relationship to the department, and 855 posed specific questions regarding particular symptoms, diagnostic tests, or therapy. Other inquiries requested second opinions (112) and general information about a specific disorder, treatment, or medication (272). Inquiries made by parents, relatives, and guardians totalled 1001, compared with 238 made by physicians and other health care professionals. Of the total requests, nearly 200 originated outside the United States. The authors noted that many families who consulted the program reported that they found it less intimidating than face-to-face conversations and felt freer to ask questions. Similar results were reported in a study concerning use of a Web site devoted to cardiac arrhythmias [32].

Many Web sites that offer e-consultation are designed primarily to provide general information. Others may not be prepared to respond to specific inquiries in a timely manner and/or may not regularly respond to unsolicited e-mails from patients, even when the requests clearly describe a medical emergency [33]. To protect patients, sites that are not designed or staffed to respond to specific clinical questions in a timely manner should post prominent disclaimers to that effect [33].

Challenges for Physicians

Physicians who practice online face several challenges. For example, computerized medical records are not yet widely used, although some health plans have adopted them [34,35]. Currently, no uniform protocol exists for clinical coding and data entry [36,37], and electronic medical records therefore may be of limited utility. Nor can online physicians examine "e-patients" to obtain important clinical information. They must guide patients to describe their symptoms as clearly as possible to help compensate for the absence of face-to-face interaction.

Assuring adequate follow-up in an online environment may pose problems as well, especially with patients who live outside the physician's area, as is often the case in e-consultation. Physicians who practice online are obligated to make good faith efforts to see that patients get needed care, such as by working with patients to help them identify local health care resources. No clinician can be expected to be aware of all the practitioners, facilities, and services that are available to a patient locally. However, clinicians can help patients find appropriate care providers by directing them to national organizations (as Dr. Jenkins did for his patient with Alzheimer's disease in the second scenario) or to state or local medical associations.

Physicians and other health care professionals who practice online must help patients understand the nature

and limitations of online health consultation. In some situations, such as the case of Dr. Brady's patient with a swollen and painful calf, patients seeking e-consultation should be directed to seek care in person. In addition, professional licensing, prescribing, and other laws may affect what care can be provided online, such as when a physician is not licensed to practice in an e-patient's home state or country. The Internet transcends traditional jurisdictional boundaries, and many legal questions remain unresolved [1,27].

The Future of E-Health

Whether e-health technologies will realize their potential to enhance clinical practice and improve patients' health is yet to be determined. Nonetheless, as physicians plan for practice in the 21st century, they must consider what role the Internet and e-mail will play in their practices. Concerns have been raised, for example, about how using e-mail will affect physicians' already busy practice schedules. Those physicians who regularly use e-mail with patients report that it has not increased their workload [22]. However, responding to patient e-mail could be burdensome if only a minority of patients in a practice routinely use it to communicate. In such situations, e-mail may only add to the number of messages physicians receive, not replace other forms of communication [20].

One obstacle to using the Internet effectively in patient care thus is patients' access to the technology itself. Although the number of individuals with access to the Internet is growing rapidly, access still correlates with higher socioeconomic status [6]. Even among those who have access to and use the Internet for health-related purposes, 54% are white collar professionals, whereas only 11% are blue collar workers [11].

How useful the Web will be as a tool for complementing face-to-face interactions also remains unclear. Patients may attempt to manage their health primarily through the Web and e-mail, thus reducing the personal contact that is an important component of health care. Web-based tools to help manage chronic conditions, such as diabetes, are already being developed [37,38]. Such tools can provide patient education and support self-care, allow patients to communicate with health care providers, and/or alert providers about patients in their practices who should be monitored closely. How well such disease management tools will serve physicians and their patients will depend on whether they rely on narrow, algorithm-driven management recommendations or are flexible enough to allow physicians to exercise clinical judgment. Physicians will need to adapt and evolve their own practice

styles in response to such changes, with unclear implications for the future of office-based medical care.

As patients and physicians become more sophisticated in locating high quality information on the Web, patients may find more of the support they need online and physicians may be able to use their limited time with patients more effectively. Cases such as that of Dr. Overbeck, in which physicians must spend time sorting good information from poor, may thus become less common.

Despite the challenges the Internet poses, it may become as widely accepted a tool for clinical practice as the telephone. And as happened in the early days of the telephone, physicians who choose not to use Web-based technologies at this time may face increasing pressure to do so as e-health technologies become more widely accepted in health care [2].

Dr. Crigger served as principal editor and writer of the eHealth Code of Ethics.

References

1. Mandl KD, Kochane IS, Brandt AM. Electronic patient-physician communication: problems and promise. *Ann Intern Med* 1998;129:495-500.
2. Spielberg AR. On call and online: sociohistorical, legal, and ethical implications of e-mail for the patient-physician relationship. *JAMA* 1998;280:1353-9.
3. Moyer CA, Stern DT, Katz SJ, Fendrick MA. "We got mail": electronic communication between physicians and patients. *Am J Manag Care* 1999;5:1513-22.
4. Electronic communication and the future of ob-gyn. *ACOG Today* 2000; Apr 12-3.
5. Grove AS. A piece of my mind. The x factor. *JAMA* 1998;280:1294.
6. Science Panel on Interactive Communication and Health. *Wired for health and well-being: the emergence of interactive health communication*. Eng TR, Gustafson DH, editors. Washington (DC): U.S. Department of Health and Human Services, U.S. Government Printing Office, 1999.
7. Health Information Technology Institute. *Criteria for assessing the quality of health information on the Internet*. MacLean (VA): Mitretek Systems, Inc; 1997. Available at: hitiweb.mitretek.org/docs/criteria.html. Accessed 14 Aug 2000.
8. Crigger B-J. Oh what a tangled Web.... *Hastings Ctr Rpt* 2000;30:48.
9. Badgett RG. How to search for and evaluate medical evidence. *Semin Med Pract* 1999;2:8-14.
10. Hunt DL, Jaeschke R, McKibbon KA. Users' guides to the medical literature: XXI. Using electronic health information resources in evidence-based practice. The Evidence-Based Medicine Working Group. *JAMA* 2000; 283:1875-9.

11. Miller TE, Reents S. The Internet Strategies Group. The health care industry in transition: the online mandate to change. New York: Cyber Dialogue; 1998. Available at: www.cyberdialogue.com/pdfs/wp/wp-cch-1999-transition.pdf.
12. Kolata G. Web research transforms visit to the doctor. *New York Times* 2000 March 6:A1 (col. 3-6), A20 (col. 1-5).
13. Peters R, Sikorski R. Digital dialogue: sharing information and interests on the Internet. *JAMA* 1997;277:1258-60.
14. Hersh W. "A world of knowledge at your fingertips": the promise, reality, and future directions of on-line health information retrieval. *Acad Med* 1999;74:240-3.
15. Jadad AR, Haynes RB, Hunt D, Browman GP. The Internet and evidence-based decision-making: a needed synergy for efficient knowledge management in health care. *Can Med Assoc J* 2000;162:362-5.
16. Lindberg DA, Humphreys BL. Medicine and health on the Internet: the good, the bad, and the ugly. *JAMA* 1998;280:1303-4.
17. Muir Gray JA, de Lusignan S. National electronic Library for Health. *BMJ* 1999;319:1476-9.
18. Eysenbach G, Diepgen TL. Towards quality management of medical information on the Internet: evaluation, labeling, and filtering of information. *BMJ* 1998; 317:1496-1500.
19. Kim P, Eng TR, Deering MJ, Maxfield A. Published criteria for evaluating health related web sites: review. *BMJ* 1999; 318:647-9. Available at: www.bmj.com/cgi/content/full/318/7184/647. Accessed 13 Aug 2000.
20. eHealth Ethics Initiative. eHealth code of ethics. Available at: www.ihealthcoalition.org/ethics/ehcode.html. Accessed 25 May 2000.
21. Health on the Net Foundation. HON code of conduct (HONcode) for medical and health Web sites. Available at www.hon.ch/Conduct.html. Accessed: 10 Aug 2000.
22. Kane B, Sands DZ, for the AMIA Internet Working Group, Task Force on Guidelines for the Use of Clinic-Patient Electronic Mail. Guidelines for the clinical use of electronic mail with patients. *J Am Med Inform Assoc* 1998;5:104-11. Available at: www.amia.org/pubs/pospaper/positio2.htm. Accessed 10 Aug 2000.
23. International Society for Mental Health Online. ISMHO/PSI suggested principles for the online provision of mental health services, ver. 3.11. Available at: www.ismho.org/suggestions.html. Accessed 12 Jun 2000.
24. Health Internet Ethics. Ethical principles for offering Internet health services to consumers. Available at: www.ethics.org/Principles/index.asp. Accessed 23 May 2000.
25. Winker MA, Flanagan A, Chi-Lum B, White J, Andrews K, Kennett RL, et al. Guidelines for medical and health information sites on the Internet. American Medical Association Council on Ethical and Judicial Affairs. Available at: www.ama-assn.org/about/guidelines.htm. Accessed 23 May 2000.
26. Peters R, Sikorski R. Building your own: a physician's guide to creating a Web site. *JAMA* 1998;280:1365-6.
27. Kuszler P. Telemedicine and the changing face of the doctor-patient relationship. *Health Law News* 1999; 13:13-4.
28. Nielson J. How users read on the Web. Available at: www.useit.com/alertbox/9710a.html. Accessed 6 Apr 2000.
29. Cassell E. The principles of the Belmont Report revisited. *Hastings Ctr Rpt* 2000;30:12-21.
30. Goldman EL. Setting your sites on Web-marketing strategies. *Intern Med News* 2000;33:48.
31. Borowitz SM, Wyatt JG. The origin, content, and workload of e-mail consultations. *JAMA* 1998;280: 1321-4.
32. Widman LE, Tong DA. Requests for medical advice from patients and families to health care providers who publish on the World Wide Web. *Arch Intern Med* 1997; 157:209-12.
33. Eysenbach G, Diepgen TL. Responses to unsolicited patient e-mail requests for medical advice on the World Wide Web. *JAMA* 1998;280:1333-5.
34. Chin HL, Krall MA. Successful implementation of a comprehensive computer-based patient record system in Kaiser Permanente Northwest: strategy and experience. *Effective Clin Pract* 1998;1:51-60.
35. Churgin P, Strawn K. Population health management with computerized patient records. *Effective Clin Pract* 1998;1:61-5.
36. McDonald CJ, Overhage JM, Dexter PR, Blevins L, Meeks-Johnson J, Suico JG, et al. Canopy computing: using the Web in clinical practice. *JAMA* 1998;280: 1325-9.
37. Gottlieb S. Study explores Internet as a tool for care of diabetic patients. *BMJ* 2000;320:892. Available at: www.bmj.com/cgi/content/full/320/7239/892. Accessed 10 Aug 2000.
38. McAlearney AS. Viewpoint. Information technology for a Medicare risk population. *Drug Benefits Trends* 1999; 11:58-60. Available at: www.medscape.com/SCP/DBT/1999/v11.n08/d5734.mcal/d5734.mcal-01.html. Accessed 13 Aug 2000.

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