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e-Health: A New Approach in Healthcare Practice

Vinod K. Podichetty MD, MS
Robert S. Biscup, D.O., M.S.
Cleveland Clinic Florida Spine Institute
Weston, Florida
United States

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Abstract
The Internet offers an unprecedented opportunity for healthcare information to be disseminated instantaneously. Quality of information, both scientific and nonscientific, and the development of tools to disseminate information securely via the Internet are the two most important issues related to achieving effective and wider exchange of health information. For the first time ever, information can be exchanged simultaneously and interactively all around the world, with the potential of being equally available to healthcare professionals as well as to patients. The big difference between yesterday's knowledge-based patient care and that of tomorrow, is a fundamental premise that patients will explore the web world with a desire to learn more about their condition, including its treatment and prognosis. This has evolved into the concept of e-health (Electronic Health). Evaluation and examination of the information being conveyed via the Internet is important and necessary in order for the Internet to be an effective tool in healthcare.

Introduction
The Internet is a widely accessible source of medical information to patients.[1] The present electronic revolution through the Internet has proved to be dramatic but sometimes overwhelming and confusing. Massive amounts of information, both scientific and experimental, can now be exchanged in all directions causing concern about an overload of information that is easy to access but difficult to evaluate. Health professionals are increasingly being drawn into evaluating the Internet as a source of consumer information about health and medicine.[2] Early studies report an estimated 100,000 health-related web sites, and more than 35% of the people using the Internet utilize it for health and medical information.[3-5] This paper discusses the problems inherent in using the Internet for dissemination of healthcare and patient-related information and makes recommendations to overcome these problems.

Professionals and Patients Online
Healthcare professionals use the web to access databases, such as Medline, and electronic publications, but in many parts of the (developed) world they clearly lag behind other professions in their use of modern information technology. Instead, consumers have taken the lead in adopting the new media for retrieving and exchanging health information. Informed and Internet-savvy patients will play a crucial role in being a major driving force for clinicians to 'go online' to obtain evidence-based medicine. Patients accessing online information will inevitably increase the pressure on caregivers to use timely data, and will encourage them to acquaint themselves with information technology to deliver high quality healthcare. For the first time ever, patients have access to the knowledge bases of medicine. However much of what is available to patient's over the Internet is commercially tainted (i.e. infomercials) as opposed to the more objective information resources available to healthcare professionals. Also, even if the same information were available to consumers, they are not professionally trained to interpret it, which brings in the need for professional guidance. The number of Medline searches performed by directly accessing the database at the National Library of Medicine increased from 7 million in 1996 to 120 million in 1997, when free public access was opened.[6] E-health has the potential to promote the practice of evidence-based medicine by enabling health professionals and

consumers to access timely evidence from the very same knowledge base. Since clinicians cannot ignore the influence of the Internet on their patients, recommendations are needed to assure that websites provide information consistent with the best available evidence, and that these sites clearly disclose their sources of information with appropriate references.

Today, a large number of patients already use the Internet to retrieve health-related information, to interact with healthcare providers, and even to order pharmaceutical products. Patients should allow adequate time to search for information on their conditions and should be aware that a single site will probably not provide a comprehensive, complete picture of what they need to know about their medical condition. It is imperative that the information patients find on the Internet should be discussed with their relevant healthcare providers before using it to make treatment decisions. Credibility and reliability should be ensured by reviewing the editorial board of experts maintaining the website and to remember that health information quality on the Internet varies from site to site and may be tainted with the commercial interests of the host.

Healthcare professionals need to welcome the idea of patients being interested in their own health and should become thoroughly aware of what is available to them on the Internet. Since patient-specific options and risk-benefit scenarios are numerous, the need for guided education of patients is greater than ever. A patient who is well-educated about his or her disease, prognosis, and treatment choices is likely to work better with the medical system and have greater overall satisfaction with care than a patient without disease-specific knowledge. An educated patient finds fewer surprises during treatment and follow-up and understands the role of multidisciplinary treatments. Answering consumer questions, and correcting possible erroneous information found on the Internet provides an opportunity for practitioners to engage in productive dialogue with their patients. Referring patients to printed materials and the Internet for further information supports communication and lets the consumers know that their interest and research are important. Guiding the consumers to quality web sites is a good education and partnership role for the healthcare provider and encourages positive health consumer behavior.

Efficiency of Electronic Health Information

Though the Internet offers an unprecedented opportunity for healthcare information to be disseminated at the click of a mouse, it is usually not subject to peer review, regardless of the qualifications or motive of the host or the quality of information provided.[7] Scientific literature so far has dealt mostly with the evaluation of internal content, 7,8,9 but authors have tried to develop criteria for evaluating structure, content, design, and functionality.[10-12] Existing studies are incomplete or inaccurate in their evaluation of specific health information on the Internet.[5-13] For example, a study on urinary incontinence investigated interactive aspects of the Internet, such as Web doctors and news groups.[14] Although the results demonstrated that only a limited number of sites provide useful information, the author concluded that excellent information can be found on the Internet.[14]

In our opinion, (Figure 1) certain elements have an impact on the efficacy of electronic health information, such as education, regulation/legislation, ethics, evaluation and professional practice guidelines. These elements are necessary to ensure that information is provided to realize the full potential of the Internet for patient empowerment.

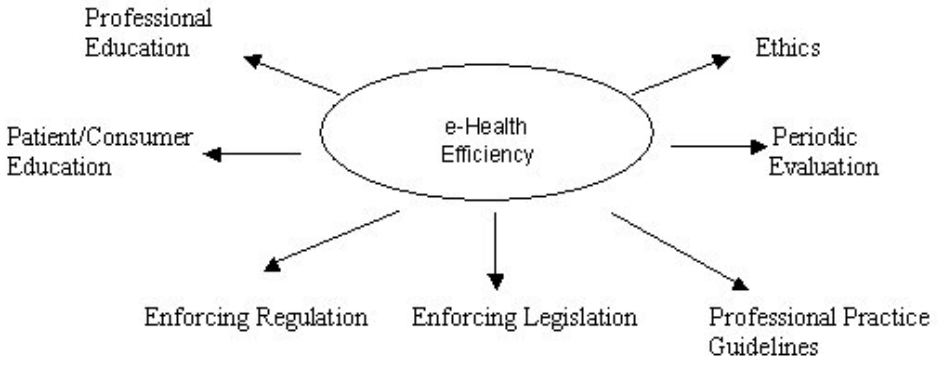

Figure 1. Efficacy of Electronic Health Information

Education
Professional and patient education is an integral part of e-health quality management. Internet sites should provide relevant information, and users must make their own judgments about the health information, services or products provided by the site. The educative process should enable individuals to judge the quality of the health information released on the Internet. Sites should describe accurately and clearly how content is developed for the site by disclosing to users the sources used, with references or links to such sources.

Enforcing Regulation / Legislation
Enthusiasm for introducing IT solutions in healthcare has sometimes led to bypassing traditional scrutiny and quality control.[15] A compliance strategy, such as the Health Insurance Portability and Accountability Act (HIPAA), will be necessary to optimize competitive advantage in the future regulatory e-health environment. Given the cost-efficiencies and advantages online resources and tools can provide, expectations to comply with e-health security regulations are expected from both the healthcare provider and the consumer. The e-health industry should develop technical measures to help systems become more secure in compliance with state and federal legislations. Common security measures include authentication, authorization, secure transfer and storage, accountability and key management strategies.

Ethics
Health information and services provided over the Internet have the potential to improve health as well as to do harm. Organizations and individuals that provide health information on the Internet have obligations to provide high quality content, protect users' privacy, and adhere to standards of best practices for online professional services in healthcare. The goal of the e-Health Code of Ethics as outlined by Rippen and Risk, should be to ensure that people worldwide can confidently, and with full understanding of known risks, realize the potential of the Internet in managing their own health and the health of those in their care.[16]

Evaluation and practice guidelines
To assure that the health information provided is accurate, individual health sites should evaluate information cautiously and fairly, providing information that is consistent with the best available evidence, including information used to describe services or products. It is also important to include the evaluation criteria and policies followed by the editorial board. Silberg et al, proposed disclosure of authorship, ownership, or currency of information as the three accountability standards for assessing, controlling, and assuring the quality of medical information on the Internet. Discussions in scientific publications so far have dealt mostly with the evaluation of content and some have tried to develop criteria for evaluating screen design, structure, and functionality.[17-22] Existing studies have tended not to discuss the basis for the evaluation criteria used.[23,24] Professional Internet practice guidelines should respect fundamental ethical obligations to patients. They should abide by ethical codes, such as protecting patient's confidentiality, and disclosing professional and financial interests of the provider.

Medical data privacy
Today, individual health and medical data can be collected, collated, stored, analyzed and distributed in unprecedented quantities over the Internet and put to diverse uses for the ease of medical practice. Medical records some of the most personal information about an individual. Confidentiality in recording patient information, and transferring this information is of utmost importance in protecting patient privacy. These should comply with the newly enacted Health Insurance Portability and Accountability Act of 1996 protocols protecting patient records. e-health involves new forms of patient-provider interaction, which pose new challenges and threats to privacy issues. If future healthcare practice is to be web-based, secure medical data systems must be developed and maintained by healthcare organizations, physicians and allied healthcare providers to assure patient privacy while allowing for interactive sharing of information electronically.

The costs of healthcare in the United States continue to spiral upward. Computerization within healthcare is often considered a cost saving measure since it offers considerable efficiencies but, as systems are linked, the privacy concerns also grow substantially.[25] Considerable costs (much of which will involve computers) will be incurred, at least initially, to assure privacy of information as required by HIPPA. Healthcare is experiencing unprecedented growth in the number and variety of e-health practices being adopted as computer technology and Internet network connectivity become increasingly affordable. Data holders operating autonomously, and with limited knowledge, are left with the difficulty of releasing information that does not compromise privacy and/or confidentiality.[26]

Connectivity
e-health opens up a new age of connectivity that will make many administrative functions much easier for both healthcare professionals and patients. Internet-based referrals are being implemented by a number of health plans to reduce or eliminate

traditional phone calls and cumbersome paperwork. Web-based claims processing is making medical practice more economically efficient by improving cash flow.

Patients and professionals can use e-mail for simple questions and other types of medical communication, avoiding the need for an office visit. Communication via e-mail directly between the healthcare provider and patient offers opportunity, but also presents problems if such communication occurs without thoughtful planning.[27] Issues of security and confidentiality, medical / legal liability, loss of the provider/patient bond, and inequitable access to technology must be addressed. Nevertheless, many physicians do respond to patient inquiries via e-mail. These may range from simple requests for appointments or tests to detailed discussions about treatment options and prognosis. A recent poll of physicians by Harris Interactive reported that 14% of physicians use e-mail to send patient-specific information.[28] More physicians (39% of respondents) would do so if the security of their communication were guaranteed; but even with such measures, 40% said they would not send clinical information by e-mail. As privacy becomes legally mandated by HIPAA regulations, the survey predicts that physicians will probably adapt. Most will welcome the end of 'phone tag' and clinic interruption when they can use e-mail for clinical discussion. Such non-visit care will have a profound impact on the economics of healthcare and especially the essence of healthcare, i.e. the healthcare professional-patient relationship.

Conclusion

In the late nineties a whole new industry emerged under the name `e-health' (electronic health). These early days in the evolution of e-knowledge health concepts will impact healthcare planning well into the future. There is much work to be done to better understand the power and limitations of this approach, There is a definitive need to initiate an advanced e-health research-working group to examine the implications of this emerging technology. Patients should be discouraged from using the Internet as the only source of information about their medical problems. Healthcare professionals and regulatory agencies should evaluate the existing information and play a major role in developing good-quality evidence-based web sites. They should also work together to ensure patient privacy as the applications of this new technology in clinical practice grow.

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