

CyberSurgeon

The Internet as a patient/medical education tool

by Karen Sandrick, Chicago, IL

A patient hungry for information to help him understand his coronary artery disease clicks on the *drkoop.com* Web site. When he selects his principal disease concern—heart disease—he taps directly into news stories about cholesterol-lowering drugs and the risk posed by high serum calcium levels as well as a library of information on prevention, detection, research, and treatment options. Searching the site for the keyword “surgery,” the man finds documents on robotic heart bypass in Canada and surgery for unstable angina.

- A surgeon interested in brushing up on anterior inguinal hernia repair visits *vesalius.com* and finds a clinical folio on the Kugel hernia repair. She can explore anatomic drawings that flag pertinent external and internal landmarks, take a step-by-step visual journey through the procedure, and test her knowledge of anatomy with a click of the mouse.

- A medical student at Penn State University spends part of his first three days in medical school working with a virtual reality anastomosis device to practice his approach to a defined target on the intestine or a blood vessel, his dexterity in passing a needle through the target, and his precision in connecting one anastomosis segment to another without inducing force tear.

These are just a few of the thousands of examples of medical education that are being delivered via Internet technology today.

A new way to teach and learn

It's hard to believe, but the Internet is only about four years old. This “youngster” not only is growing quickly, but it's changing the way physicians teach and learn. Of the more than a million Web sites in existence today, roughly one-third are devoted to health care, according to Robert L. Parry, MD, FACS, a pediatric surgeon at Children's Memorial Hospital, Los Angeles, CA, and member of

the Board of Regents' Committee on Informatics. Dr. Parry says that these sites fall into two broad categories: sites that allow patients to get health care information on their own and sites that allow physician peers to share their experience and expertise.

Sites for patients

Internet technology fills an important gap in patient education by giving patients the chance to absorb complicated information when they are ready to do so. Dr. Parry explains that it has been well recognized that even when physicians spend a considerable amount of time speaking directly with patients about their clinical condition and treatment plan, patients have difficulty digesting all the nuances. There simply is too much information for patients to assimilate in one sitting in the physician's office. Moreover, Dr. Parry says, patients also often have personal or family concerns, so they may not be completely engaged in the conversation with their physicians or able to think of the questions they need answered to manage their own care. But on the Internet, he says, patients can study health care information in small bits and follow a trail of investigation framed by their own inquiries.

Probably the best known patient education site on the Internet is *drkoop.com*, named after former U.S. Surgeon General C. Everett Koop, MD, FACS. The Web site's homepage is divided into sections for Top Stories, Latest News, and Today's Features, and it has links to 12 top disease centers: AIDS/HIV, allergies, Alzheimer's disease, arthritis, asthma, cancer, depression, diabetes, heart disease, hypertension, mental health, and migraine headache. The homepage offers visitors the opportunity to browse other health topics as well, including alcoholism and anorexia, and to participate in health-related chats on such topics as hepatitis, families in the new millennium, and

the “other side” of addiction.

WebMD.com, another regularly visited patient education site, features health topics from A to Z, a medical encyclopedia, a self-care advisor, drug reference, and archives. Visitors to the homepage can participate in online discussions with medical experts and post their experiences, as well as read those of other patients, on message boards. Patients can use *WebMD.com* to search the World Wide Web for news and articles about a specific health topic. The site categorizes the results of a search according to scientific information resources, patient education, general health information, and news and references. It also lists the most popular sites visited by individuals interested in the same topic, such as the American College of Surgeons, Surgery from *About.com*, Plastic Surgery Guide, and the International Museum of Surgical Science.

Sites for physicians

The Internet also shrinks the world of medical knowledge for practicing physicians, Dr. Parry says, by bringing continuing medical education conferences to the physician’s office PC. On the *Medscape.com* surgery site, for example, surgeons can receive daily summaries from the 10th European Cancer Conference, which was held in Vienna, Austria, in September 1999. Surgeons can then focus directly on one or more of the presentations, such as a discussion of what has been learned over a decade of treatment for ovarian cancer or what has been discovered in the fields of angiogenesis and cell biology.

The Internet’s ability to deliver information quickly creates an immediate and interactive forum for physicians to communicate and educate one another. Its increasing three-dimensional capabilities take anatomy out of two-dimensional textbooks and the gross laboratory and into a more “real” realm. However, according to W. William Haines, senior director of product development for *MDCConsult*, an online joint venture among three of the largest medical publishers, there are relatively few sites devoted principally or exclusively to surgery, and many of these sites have limited information.

VirtualOR, for example, has a handful of cardiac procedures online, and *Healthstream*, a major provider of CME content, only recently opened a surgery center on its site. *MDCConsult*, which was

launched in 1997, has more than 70,000 subscribers and has been licensed by nearly 50 percent of the country’s academic medical centers for use by the physicians on their staff. Although it is directed primarily to primary care physicians, *MDCConsult* has some surgical content. It features textbooks and journals on surgery, such as *Surgical Clinics of North America* and *Annals of Surgery*.

Medscape, another broad-based medical education site, offers information across a wide range of specialties. *Medscape* provides news articles involving surgical topics as well as links to journals, some of which are not in the *Index Medicus*. Some of its summaries of clinical conferences are accompanied by a multiple-choice test that surgeons may take to gain CME credit.

Vesalius.com, which concentrates on surgery, presents short educational narratives about anatomy and surgical technique. It has more than 1,000 illustrations in its image archive, including photos and radiographs. It provides 50 graphical narratives that serve as anatomical context for surgical procedures and another 50 images that can be sectioned layer by layer.

Medical education

Internet-based virtual technology also is revolutionizing the way surgical students, interns, and residents hone their skills, Dr. Parry says, and points to the work done by Thomas Krummel, MD, FACS, a professor of surgery at Stanford Medical School, Palo Alto, CA, as an example. While at Penn State University, Dr. Krummel helped create the First Three Days in Surgery program, during which incoming surgical interns and residents tackle the areas in which they feel most deficient, particularly operative skills. With a virtual reality phantom, students track their movements on a computer screen as they wield surgical instruments in a simulated anastomosis exercise. After spending 15 minutes a day on the virtual reality anastomosis device, students’ total performance scores rose from 39.8 on day one to 56.3 on day three, and their confidence level increased from 6.36 to 8.38, which was statistically significant, according to Dr. Krummel.

Another innovation has been introduced at the University of Southern California (USC), where interactive programs are being coupled with actual patient case histories to make medical stu-

dents' basic science years more clinically relevant. The programs track students' responses, make suggestions, and respond to students' comments, says Dixie L. Fisher, PhD, who heads the division of medical education at USC. Pediatric radiology cases, for example, begin with graphically rich, interactive tutorials, then ask students to build their case reports. Students complete their own patient histories and generate a tentative diagnosis. Students later compare their diagnosis with the diagnosis an attending physician actually considered.

Content conundrum

It nevertheless is difficult for patients and physicians to know whether they can trust the content, which includes both text and images, that is presented on individual Web sites. According to Dr. Parry, development of an educational Web site is costly and time-consuming. "You need a business engine to drive the delivery of the content, but the distinction between business driving clean content and business using content as fuel is blurry."

For example, some Web sites, Dr. Parry points out, are strictly commercial marketing vehicles; they exist to promote a particular product, program, or health care delivery site. Other sites are wholly altruistic and seek only to provide accurate content. There is no easy way of distinguishing between them, however, because the qualifications and background of the authors and the validity of the content are not clear. "The problem is that there is no way to know whether you have a legitimate source or whether the sources of the content are employed by a company that wants to sell something," he says.

In addition to uncertain quality of the content on health care Web sites, there is the question of relevance. "A patient can look for breast cancer topics on the Internet and get 2,000 articles, but 1,900 of those articles will be irrelevant because they discuss stage IV disease and the patient is only in stage I. But the patient doesn't know that; the site doesn't tell her that," Dr. Parry says.

Even if the content on a Web site is valid and relevant, it can quickly become outdated. Web sites need to be revised almost on a daily basis. Because of lack of financial support for adequate maintenance, many Web sites become orphans; they ei-

ther fail to come to full fruition or die on the vine from lack of attention.

New business approaches

"Some health care sites are trying to bring validity to the World Wide Web. They are trying to ensure that content is driven by a business engine and yet remains clean and trusted," Dr. Parry says. These sites are attempting to deliver current, relevant, and trustful content within a business model that compensates the medical professionals—the medical societies or individual practitioners—who generate the content. The premise behind this approach is to grant physicians the right to retain ownership of their intellectual property. Physician leaders, such as those in the ACS Commission on Cancer, the American College of Surgeons, and other specialty societies "have knowledge that they gained throughout their years of training and practicing medicine. They should be allowed to own the intellectual property that they have amassed," Dr. Parry explains.

Fifteen years ago physicians could afford to take the time to develop content for patient education or continuing medical education. The reimbursement structure today does not support this effort, however, and pressures to increase productivity and efficiency leave less free time for building case study reports or other teaching vehicles. "Altruistic development of pure content to educate patients or physicians in the global sense cannot happen in the way the medical world exists right now. The objective, therefore, is to bring to physicians the control they need to deliver trusted content through a compensation model," Dr. Parry adds.

Medem, created by the American Medical Association, is one of these endeavors. When formally launched in late winter 2000, *Medem* will be a single super-site through which patients may obtain high-quality and credible health care information. The site will offer comprehensive information that is consumer friendly and yet draws from the same clinical data and references used by medical professionals. *Medem* also will incorporate interactive technologies so patients can find the information that is most meaningful and relevant

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The *Journal* page

Message from the Editor

by Seymour I. Schwartz, MD, FACS, Rochester, NY

The tradition of annually publishing an issue of the *Journal of the American College of Surgeons* dedicated to the presentation of "What's New in Surgery" is manifest evidence of the commitment of the American College of Surgeons to serve as corporate body for all of the surgical disciplines. The Fellowship of the American College of Surgeons is made up of representatives of all surgical specialties. Approximately 45 percent of the 60,000-plus Fellows are categorized as general surgeons, and the remaining 55 percent come from each of the other surgical specialties.

The transformation of the *Journal of the American College of Surgeons* incorporates the dissemination of educational material to all of the College's constituencies as one of its major goals. "What's New in Surgery" evolves from the contributions of leaders in each of the fields of surgery. In each instance the author has been designated by the appropriate one of the College's Advisory Councils for the Surgical Specialties.

This update brings into focus the majors issues

that each specialty has considered over the past year. In a time of accelerated expansion of our base of knowledge, this issue of the *Journal* represents a time capsule, if you will. The material addressed in each of the contributions represents the assessment of a single, albeit highly respected, leader in the field. As is true of all historical critiques, the historian presents a personal evaluation; there are other assessments that might be just as historically useful, and any of these presentations might not necessarily be endorsed by all surgical specialists in the discipline or even by the majority of them. But within the binding of the February issue of the *Journal*, we have attempted to provide a kaleidoscopic view of what happened in the realm of surgery during the recent past.

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to their clinical problems and situations.

Medem, which takes its name from the concept of medical empowerment, is a product of three business entities: a for-profit Internet company, an independent editorial company, and a charitable foundation. It is being fashioned by seven leading medical professional associations. When in place, the Web site will provide patients with direct access to information that has been credentialed by these societies.

Yourdoctor.com, which is still in the conceptual stage, is the product of a cooperative venture that will give equity to the physician leaders who contribute to its content. When it is launched, 4,000 physicians will own stock in the venture. (*Yourdoctor.com* will be discussed in

more detail in an upcoming "CyberSurgeon" column.)

According to Dr. Parry, as new operating theaters are built with digital image-capturing devices, as higher speed modems improve the quality of online videos, and as surgeons grow more accustomed to computer-based technologies, the Internet will become even more critical to medical education—giving physicians a direct connection with their patients and their peers. □

This column was generated through the efforts of the ACS Regental Committee on Informatics. Members of the committee believe that this and other articles appearing in this column will be of special interest to surgeons and their practices.