The Internet has changed how patients with cancer learn about and cope with their disease. Newly diagnosed patients with cancer often have complex educational and informational needs related to diagnosis and treatment. Nurses frequently encounter time and work-related constraints that can interfere with the provision of patient education. They are challenged to educate patients in an environment of rapidly expanding and innovative computer technology. Barriers that hinder nurses in integrating educational Internet resources into patient care include lack of training, time constraints, and inadequate administrative support. Advantages of Internet use for patient education and support include wide-ranging and current information, a variety of teaching formats, patient empowerment, new communication options, and support 24 hours a day, seven days a week. Pitfalls associated with Internet use for patients with cancer include inaccurate information, lack of access, poor quality of online resources, and security and privacy issues. Nurses routinely use computer technology in the workplace and follow rigorous security and privacy standards to protect patient information. Those skills can provide the foundation for the use of online sources for patient teaching. Nurses play an important role in helping patients evaluate the veracity of online information and introducing them to reliable Internet resources.

At a Glance

- Patients with cancer are using the Internet as a resource for information about their disease and treatment.
- The Internet provides resources for nurses that can be used for individualized patient teaching.
- Instructing patients about effectively accessing information on the Internet is integral to oncology nurses’ roles as patient educators and advocates.

Nursing Challenges in Providing Quality Patient Education

Newly diagnosed patients with cancer often have complex educational and informational needs and may be expected...
to choose from a variety of diagnostic, treatment, and symptom management options that were not available previously (Stockdale & D’Ambrogio, 2003). Diagnostic procedures may include genetic testing, the use of tumor markers, or computer-enhanced imaging to help guide treatment decisions. Complex surgical techniques, novel chemotherapy regimens, targeted therapies, and genetic approaches to treatment are available to patients with cancer. New antiemics and biologic response modifiers allow for the administration of more concentrated (dose-dense) chemotherapy regimens. Patients may choose to participate in clinical trials or undergo complex treatment regimens that might require innovative nursing procedures to keep patients on track. Making informed treatment decisions becomes a high priority when so many choices are available (Dickerson, Boehmke, Ogle, & Brown, 2006).

Information related to treatment options that are provided to patients, family members, and caregivers may be extremely complex and confusing (Markman, Markman, Belland, & Petersen, 2006). In a busy clinic or hospital unit, nurses often have little time to teach patients (Agre, Bookbinder, Cirrincione, & Keating, 1990). Work-related constraints and inadequate reimbursement can interfere with setting time aside for patient education. The Oncology Nursing Society’s position statement on oncology services in the ambulatory practice setting acknowledged the challenges that oncology nurses face in providing complex cancer care in an environment of cost cutting and downsizing (Oncology Nursing Society, 2006).

Teaching often is less effective in patients who experience high anxiety levels secondary to a cancer diagnosis (Williams & Schreier, 2005). However, patient safety may depend on adequate understanding of the side effects of treatment and managing them at home. Optimal teaching plans ensure that the extent, content, and timing of information given to patients are tailored to meet their needs (Balmer, 2005). Patients who have difficulty using standard written materials or those who learn best from auditory or visual information may require innovative teaching methods. Given the demands inherent in teaching oncology patients, qualified personnel who use appropriate information technology may best meet educational needs.

Nurses may find it challenging to educate patients in an environment of rapidly expanding and innovative technology, particularly computer technology. Patients often turn to the Internet for health-related information prior to consulting a physician and may find a vast amount of material at their disposal (Ahmad, Hudak, Bercovitz, Hollenberg, & Levinson, 2006; Hesse et al., 2005). Although some patients may find ready access to information empowering (LaCoursiere, Knobf, & McCorkle, 2005), others experience increased anxiety and frustration (California Healthcare Foundation, 2005; Woolf, Krist, Johnson, & Stenborg, 2005). Patients may receive conflicting health-related information from family, friends, and the media. Part of nurses’ role as teachers is to help patients access and evaluate information so that they can make appropriate decisions and facilitate self-care (Loxton, 2003). Nurses should be aware that information from outside sources might conflict with oncologists’ recommendations.

Barriers to Integrating Internet Educational Resources

Nurses may feel uncomfortable using new computer technology and hesitant to adopt the Internet as a source of information for patient teaching. Many value interpersonal contact when communicating knowledge and desire satisfaction from providing hands-on care. Although these values are important, they may hinder the adoption of health information technology (HIT) that will move nursing forward as a profession (McBride, 2005).

Other barriers that impede using HIT to improve nursing practice include a lack of training, inadequate time, or lack of online access in the workplace (Lawrence, 2006; Sigma Theta Tau International Honor Society of Nursing, 2006). Administrative support is essential if nurses are to integrate online sources into patient education. Some employers may be concerned that employees will use Internet access inappropriately. Even so, adequate access to computer terminals should be provided, and the time needed to locate appropriate Internet information must be considered productive time (Dickerson et al., 2005). In addition, the teaching aspects of nursing practice should be valued as much as the physical ones by administrators, physicians, and nurses (Estabrooks, O’Leary, Ricker, & Humphrey, 2003).

Advantages of Internet Use in Patient Education and Support

Patients use the Internet to meet a wide range of informational and support needs that might otherwise be unmet.
Patients, family members, and caregivers may use online resources to seek opinions on health care, understand symptoms, and interpret information received from healthcare providers. In addition, online sources may be used to help patients understand their disease, formulate questions to ask during healthcare visits, or feel in control of their lives (Ziebland et al., 2004).

**Current and Comprehensive Information**

Traditional oncology teaching tools include written booklets and teaching sheets that may be expensive to print, require significant storage space, and need periodic updates. Because of those constraints, educational materials housed in healthcare facilities may be limited and information about rare cancers or unusual procedures may be difficult to find. Even so, patients need accurate and expert information to make informed decisions about their treatment plans, symptom management, and coping strategies (Schultz, 2002). The wealth of information available on the Internet may be an adjunctive teaching option when storage space for educational materials is restricted. Printed information sheets can be accessed from the Internet for those patients who prefer hard copies of educational material.

**Alternative Education Tools**

The Internet may offer patients more flexible and user-friendly formats than traditional written teaching materials. Online sources also may provide a variety of teaching tools that use audio and video formats and may be beneficial to people who have limited visual or language skills. For example, the National Institutes of Health (NIH) SeniorHealth Web site allows site visitors to change text size and use audio programs to accommodate those with visual defects (National Institute on Aging & National Library of Medicine [NLM], 2007). Programs offered online in a video-game format may appeal to younger people (e.g., the Cancer Game, Ben’s Game) (see Figure 1). Such venues often allow for more individualized and self-paced patient teaching and learning (Gomella et al., 2000; Lieberman, 2001).

**Feeling of Empowerment**

Patients often feel empowered when they have access to information and have been reported to cope better and experience less uncertainty when using the Internet as a resource for obtaining health-related material (LaCoursiere et al., 2005). Online information can reinforce teaching in clinics at a time of patients’ choosing. Internet resources may be beneficial to people in pain, those who experience side effects of treatment, and those who live in geographically remote locations. Family caregivers’ informational and support needs also may be met by Internet programs that can supplement caregiver training done by healthcare professionals (Lewis, 2003; Reis, McGinty, & Jones, 2003).

**Communication Options**

E-mail correspondence is ranked by users as the number one reason for going online and is an important support mechanism for patients and family members (Eysenbach, 2003). E-mail is used by patients with cancer to communicate with friends and family, create social networks, and contact healthcare providers. Patients with cancer may use e-mail to discuss information about treatment options, cope with side effects, and receive emotional support (Eysenbach; Rimer et al., 2005). E-mail communication between providers and patients can be useful in avoiding phone-tag situations when questions or concerns arise. However, healthcare practitioners have been reluctant to embrace e-mail communication with patients because of time constraints (including ability to respond in a timely fashion), lack of confidentiality, volume of e-mail, and lack of remuneration (Hesse et al., 2005; Kassirer, 2000; Moyer, Stern, Dobias, Cox, & Katz, 2002; Patt, Houston, Jenckes, Sands, & Ford, 2003; Penson et al., 2002). The American Medical Association (2004) has published guidelines to help avoid problems with that approach to patient and healthcare practitioner interactions. Secure Web-based provider-patient communication servers can address concerns about security and privacy when sensitive information is being communicated (Liederman & Morefield, 2003).

Patients with cancer have embraced personal Web pages as another means of communicating information to and receiving support from their social networks (Suzuki & Beale, 2006). Some organizations (e.g., CaringBridge®, Carepages) offer free, personalized, password-protected Web sites to patients that provide an easy, accessible, and private way to share information and receive support in a controlled manner (Chandler, 2006).

**Support**

Internet groups offer many benefits to patients, including social support, health information, shared experience, positive role models, empowerment, professional resources, and patient advocacy (Im, Chee, Tsai, Lin, & Cheng, 2005; Klemm et al., 2003; Nolan et al., 2006). Patients with cancer use online groups because they offer access 24 hours a day, at-home availability, anonymity, information, support, and convenience (Klemm & Hardie, 2002; Scale, Ziebland, & Charteris-Black, 2006). The likelihood of finding other patients with similar life circumstances who are facing the same cancer care issues is much higher on the Internet than in face-to-face support groups, especially for patients residing in less-populated areas or those with rare tumors. Online support groups also may be used by family members and caregivers, who often have stress equal to or greater than patients yet may not receive the support and services they need from healthcare providers (Penson et al., 2002). One of the largest and oldest online support services can be found at the Association of Cancer Online Resources (www.acor.org).

**Potential Pitfalls of Internet Use for Patients**

**Excessive Information**

Internet searches may not provide information that is personally relevant to patients. As one patient stated, “I view this initial experience with the Internet as mixed; what I learned in the end was useful, but there was a high aggravation factor and a feeling that I came upon the information by happenstance” (Penson et
al., 2002, p. 556). Excessive information can challenge patients emotionally and psychologically. People who encounter multiple choices for treatment online may expect too much (i.e., to find the perfect choice for them), discover that they are unable to act upon the information (indecision), or have difficulty discerning the differences among their choices (California Healthcare Foundation, 2005; Woolf et al., 2005).

**Limited Access**

The Internet is a potentially powerful tool for the education of patients, but its usefulness is limited by accessibility factors. Those who are most likely to have a computer from which to access the Internet generally have higher incomes and levels of education, whereas those lacking access are more likely to have low income, have less education, and be African American, Hispanic, or disabled (Gilmour, 2006). Although older adults in the United States are using technology in increasing numbers, they typically report more difficulty than younger people in learning to operate computers and use the Internet effectively (Czaja et al., 2006). Even younger adults may experience frustration using the Internet to obtain health information because many online sites require at least a high-school proficiency in reading (Birru et al., 2004; Birru & Steinman, 2004). Some individuals will not or cannot use the Internet to find health-related information. They may lack the technical knowledge, skills, or desire to use computers for educational purposes. Lack of interest is a primary barrier to Internet access (Abdollah et al., 2005; Lenhart et al., 2003).

**Complementary and Alternative Medicine**

Although patients may perceive products advertised as natural to be safe, they should exercise care when researching information on complementary and alternative medicine (CAM) online. Documented research on the efficacy of CAM products is limited, and some poor-quality CAM information found online can...
be dangerous to consumers. One group of researchers analyzed material posted on Web sites that provided information on CAM (Walji et al., 2004). The findings indicated that 97% of the CAM Web sites reviewed by the researchers omitted vital warnings, drug interactions, contraindications, or adverse reactions that could lead to physical harm. Another report described a strategy for screening Internet sites that provided information on CAM therapies (Mathews, Camacho, Mills, & Dimsdale, 2003). The researchers evaluated 194 CAM sites for what they termed “red flags” (i.e., online purchasing, patient testimonials, treatment described as a cure for cancer, and treatments having no side effects). They found that sites with at least one red flag provided a great deal of vague and inaccurate information, whereas sites with no red flags included at least some reliable information. The Office of Cancer Complementary and Alternative Medicine at the National Cancer Institute provides reliable information about CAM (www.cancer.gov/cam/index.html).

Inaccurate Information

Health information seekers frequently use the most convenient means available to obtain information online. Eighty-one percent of individuals seeking health-related information online use a search engine (e.g., Google, AltaVista, Dogpile, Yahoo, MSN) to begin their queries. Consumers often trust search engines to be fair and unbiased when posting search results. However, most individuals know little about the operation of search engines, how searches are conducted, or the criteria for presenting the results (Lorence & Greenberg, 2006). Provided an individual has Internet access and appropriate computer resources, few restrictions exist to posting information online. As a result, health-related information may be perceived as expert advice regardless of its validity (Patrick, Intille, & Zabinski, 2005).

Although the provision of inaccurate information to a potential audience is not a new phenomenon, the Internet is unique. Information posted online has the potential for reaching a very wide audience. Medical misinformation (e.g., incomplete, incorrect, outdated) is available online and coexists with reliable material posted by credible sources (Penson et al., 2002). The lay public may not have the skills necessary to discriminate between sites that provide unbiased, well-researched information and those that do not. Assessing the quality of information online does not apply only to educational sites. Just as information obtained from family and friends may not be accurate, online discussion groups that are not reviewed or facilitated by a healthcare professional also may disseminate incorrect information (Penson et al.).

Security and Privacy

Visitors to health-related Web sites often assume that they are using the Internet anonymously. However, information about them and their Internet use may be collected without their knowledge or consent. Few health-related sites hold third parties to the same standards that they use, and privacy protections may not follow visitors’ data once it leaves the original Web site (Goldman & Hudson, 2000). The hosts of many Internet sites employ the use of cookies (data stored locally on the browser that saves information and helps identify users to Web sites at subsequent visits) and banner ads (designed to encourage users to link to an advertiser’s Web site) (Winker et al., 2000). Click-streams provide a record of the sites that are accessed during an individual’s Internet activity and are used to return users to pages that they have already visited. However, click-streams also can be used by businesses to create a user profile, thus providing an advantage over competitors (Alves, Belo, Cavalcanti, & Ferreira, 2004). Businesses also can install software to track Internet activity conducted by employees.

Overcoming Pitfalls of Internet Use for Patients

Although the argument could be made that the dangers and pitfalls listed previously might discourage patients from using the Internet for health-related information and support, many patients with cancer would disagree. Although patients may be eager to obtain and offer cancer information and support online, they usually are skeptical of unknown sources (LaCoursiere et al., 2005). Patients generally trust established, reputable sources of information and feel comfortable with their ability to evaluate Internet information. Although misinformation may occur in online support groups, it usually is corrected quickly by participants in subsequent postings (Esquivel, Meric-Bernstam, & Bernstam, 2006). Patients can use computers for online access at public and medical center libraries, where professional staff are available to assist them. In addition, librarians in university hospital settings have collaborated with nurses to help patients access and evaluate electronic health information (Lindner & Sabbagh, 2004). Although some patients find the amount of information on the Internet overwhelming, they often have support networks to help them evaluate information and decide what is relevant to their situation (Dickerson et al., 2006).
Integrating Online Resources Into Patient Care

Nurses routinely use computer technology in the workplace (e.g., medicine administration, patient charting, and online procedure manuals) to ensure patient safety, coordinate care, review current research, and evaluate outcomes. In addition, healthcare facilities already demand that their employees adhere to rigorous security, ethical, and legal standards to ensure patient privacy (McBride, 2005). Those skills can provide the foundation for the use of online resources for patient teaching. The ability to access useful and relevant information quickly and easily would free nurses to spend more time with patients.

Nurses can guide patients in the safe and effective use of online resources for obtaining accurate health-related information and support. Preliminary steps in this process should include providing information about reputable cancer-related Web sites and how to evaluate the veracity of information obtained online. Nurses may use several approaches for patients who are able, but reluctant, to access online health-related resources. The Health on the Net (HON) Foundation was formed in 1995 to guide consumers and providers in finding accurate and reliable healthcare information online (HON, 2006b). HON espouses a code of conduct for all Web sites that post medical and health-related information. A MedHunt feature is offered that provides a search engine designed to check whether Web sites meet quality standards put forth by the foundation (HON, 2006a).

The American Medical Association has published guidelines for healthcare professionals who are teaching patients how to evaluate online sites (Winker et al., 2000). Readers should be attentive to content, site ownership, sponsors, quality of materials, peer review, updates, links to other sites, advertising, and privacy statements provided on Web pages (see Figure 2). Before any online financial transactions are conducted, users should review information on security software and encryption protocols posted on the site. The Medical Library Association (MLA, 2007) provides an online resource for finding and evaluating information on the Internet and lists top online sources for healthcare information. In addition, the Food and Drug Administration, the NIH, and the National Cancer Institute's Cancer Information Service provide consumer-friendly Web sites for finding health-related information (see Figure 3). Reputable cancer Web sites recommended by the MLA include the American Cancer Society, National Cancer Institute, Centers for Disease Control and Prevention, and Cancer Care, among others.

Several Web sites provide decision support programs, designed so that patients can input data pertinent to their situations (e.g., risk factors, age, disease stage) and receive customized information that is evidence based (Markman et al., 2006). A number of insurance companies provide decision tools to help subscribers determine which healthcare provider to use (Hundley, 2006). Physicians also may provide patients with access to decision-support tools to help determine whether an office visit is needed (California Healthcare Foundation, 2006). Oncology nurses may need to provide written teaching materials for people whose primary language is not English. The American Cancer Society and the National Cancer Institute Cancer Information Service offer quality medical information online in languages other than English. Using the language tool option of an online search engine may be helpful as well. In addition, the NLM's MEDLINE® provides access to articles published in 37 languages, dating from 1950 to the present (U.S. NLM, 2007).

The NIH have launched a pilot program in which physicians write “information prescriptions” for patients, referring them to MedLine Plus® (the NIH consumer health Web site) to supplement information given during clinical appointments (McMullan, 2006; U.S. NLM, 2005). Many nonprofit (e.g., American Cancer Society), professional (e.g., American Society of Clinical Oncology), and government (e.g., National Cancer Institute) agencies provide information to help educate and support patients with cancer via the Internet. Of note, those sites offer teaching materials, which are free of commercial bias.

Nurses can integrate Internet resources into practice first by reviewing reputable sites and then incorporating the information into teaching sessions with patients. Computers

Figure 2. Suggested Criteria for Evaluating Health-Related Resources Found Online

1. Author(s)
   - Authors are listed.
   - Credentials, educational background, and affiliations of the author(s) are provided.
   - Author contact information is available.

2. Information
   - The information is
     - Accurate
     - Comprehensive
     - Current
     - Easy to read.

3. References
   - References are
     - Listed
     - Appropriate
     - Recent.

4. Sponsor
   - Sponsor is identified and is a reliable source (i.e., government agencies [.gov], medical schools [.edu], and nonprofit groups focusing on disease research and education [.org]). Commercial sites (.com) may or may not be helpful depending on whether they are providing a consumer service or trying to sell a product.

5. Electronic Media
   - Links are appropriate.
   - Graphics are useful.
   - Web pages load quickly.
   - Web site is easy to navigate.

6. Privacy and Security
   - Privacy statement explains clearly what will do with any personal information it asks for. If joining a chat room or online discussion, the site states the terms of using the service.
   - Security software information is evident.
   - Encryption protocols are disclosed.

7. Evaluation
   - Visitors are able to contact the Web site administrator with problems, questions, or feedback.
with Internet access and appropriate links to patient-related material could be provided in clinic waiting rooms. If clinics provide their own Web sites for patient information, those Web sites should be user friendly and easy to navigate (Chernecky, Macklin, & Walter, 2006; Friedman, Hoffman-Goetz, & Arockia, 2006). Volunteers with technological savvy could assist patients who wish to access information on clinic computers. Patient education materials, offered on CDs and DVDs, may be alternatives to online resources. Handouts should be available for those who prefer hard copies of educational material or links to online resources. Audio tapes or videos could be offered to those who are unable or unwilling to use computer resources.

**Conclusion**

Nurses must understand how the Internet has influenced the ways in which patients learn about and cope with their disease. Nurses encounter a number of challenges in integrating online information into patient teaching. These challenges include time constraints, new diagnostic procedures, complex treatment protocols, lack of training, and insufficient access to hardware and software.

Advantages associated with the use of the Internet include access 24 hours a day, seven days a week to current information in a variety of patient-friendly formats. Although the Internet may be a source of empowerment for patients, it can overwhelm users because of the sheer amount of information that is available. Others may be unable to access Internet resources based on income, education, physical limitations, or ethnic background. Issues of trustworthiness and security are concerns in all cases where online sources are used for health-related information. Nurses are uniquely suited to use online resources to aid in patient education and support. Computer skills previously gained in other aspects of nursing practice can provide a basis for integrating online resources into patient care.

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**References**


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**Figure 3. Web Sites for Finding Health-Related Information**

- [Medical Library Association](http://www.mlanet.org/resources/userguide.html)
- [National Cancer Institute](http://www.cancerinfonet.org/english/consumers/gp_mod2.htm (English)
- [National Institutes of Health](http://www.niams.nih.gov/hi/topics/howto/howto.htm)
- [U.S. Food and Drug Administration](http://www.fda.gov/oc/opacom/evalhealthinfo.html)


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