



BY E. LOREN BUHLE, JR.

**T**he *Philadelphia Inquirer* recently reported that one in three people will be diagnosed with cancer sometime in their life. After the shock of diagnosis, most people's next reaction is to seek information. They are finding some of that information in Penn's award-winning online resource devoted to cancer—OncoLink. Since its launch last March, OncoLink has been accessed over 350,000 times from more than 75 countries; it currently averages 4,000 accesses a day. Last May, this popular cancer resource won the 1994 international award for "Best of World-Wide Web" in the professional service category.

# Link

## Extending access to cancer information

OncoLink provides 24-hour-a-day access to cancer information for patients, physicians, healthcare workers, and other interested parties. It addresses all levels of users, providing information from many cancer-related fields ranging from introductory materials to the latest in clinical and research findings. A Review Board ensures both the quality and the content balance. And once reviewed, a document usually appears within a few hours, a rate hardly matched by conventional print media.

Organizations throughout the world access OncoLink to find useful and timely information. See, for example, the letter from the Community Breast Health Project, a grassroots organization of approximately 600 members in Palo Alto, California, which discusses how OncoLink has changed the lives of its members. You'll find the letter in the "Letters to the Editor" section.

OncoLink is also used by the medical community. Of special interest is the pediatric oncology "Case of the Month" section. These cases are now regularly used in the Nagoya University School of Medicine for teaching medical students and residents. Unusual cases, often seen only in larger medical centers, such as the University of Pennsylvania Health System, can be shared with community health groups—this is especially beneficial in rural areas of the world where a physician may rarely encounter such cases. With the assistance of Penn physicians like Ivor Benjamin, MD (Gynecologic Oncology), and other cancer specialists, the medical portions of OncoLink reach out to people across the world.

One distinguishing feature of OncoLink is its focus on all aspects of the cancer experience. You'll find material about medical, psychosocial, environmental, insurance, and support issues. This material comes from a variety of sources. Some documents are solicited for original publication online, while other materials are republished with permission. You'll find postings from government agencies and major cancer organizations, lists of clinical trials, addresses of support groups, meeting announcements, and insightful contributions from patients and friends of patients. Leveraging the wealth of knowledge at Penn, contributions have come from the Nursing, Social Work, Medicine, and Veterinary Schools.

## Accessing OncoLink

You can access OncoLink with your World-Wide Web browser (e.g., Mosaic, Lynx, Cello, Winweb, etc.), your Gopher client, or via Telnet. Use the URL: <http://cancer.med.upenn.edu/> with your Web browser or point to [cancer.med.upenn.edu](http://cancer.med.upenn.edu) with your Gopher client. Alternatively, simply telnet to [www.upenn.edu](http://www.upenn.edu), Penn's central World-Wide Web service, and select "WWW servers" from the University Information Services section. OncoLink is also available from America OnLine in the "Health Section" of the Gopher list.

## Using OncoLink

OncoLink's top menus are divided into four general categories:

- disease sites (e.g., Breast Cancer, Ovarian Cancer, etc.)
- medical specialties (e.g., Medical Oncology, Radiation Oncology, etc.)
- news items (e.g., What's New, FDA/CDC Announcements, etc.)
- links to other cancer-related resources on the Internet

You can follow the nested menus to find information of interest, but the top menu also provides you with powerful search tools. These tools address the concern, "Where do I start?" By using the search tools, you'll find promising starting points that you can use to begin your journey. For instance, you can use the "WAIS Search" tool to specify specific searching criteria such as "breast and tamoxifen", where "and" is a logical operator rather than text to be queried. You'll get back a list of documents that match your search criteria.

Alternatively, extensive hypertext links within documents pull together the information in OncoLink to address an ever-changing variety of user questions. You can, for instance, select a document and then navigate to other documents by following hypertext links (e.g., prostate → suramin → support groups, etc.). A hypertext link is a word or phrase in a document which, when selected, results in an action, such as opening a document with more specific information about the original linked word.

Hypertext links are particularly useful when you are not sure exactly what you're looking for. You may start in a promising document and follow hypertext links to other documents, focusing your attention on seeking information and not concerning yourself with the logistics of accessing documents.

If you visit OncoLink, be sure to take a look at the children's art in the "Gallery of Pediatric Oncology Patient's Artwork" section.

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## Design, goals, and future

OncoLink demonstrates that World-Wide Web technology can be used to extend the University's educational mission throughout the world. The client/server design of World-Wide Web and Gopher, coupled with the simple point-and-click interface on a PC, Macintosh, X-Window terminal, or a plain terminal, offers tremendous potential for increasing access to knowledge and information (see "The Unchained Library," *Penn Printout*, Sept 1994).

One of the design criteria underlying OncoLink is to provide access to useful information as quickly and as unobtrusively as possible. OncoLink is intended to be as easy to use as your telephone, a critical communication tool that works with little effort and visibility. To further the goal of ease of use, the developers evaluate how the service is used and make modifications when needed.

To track use, a detailed log of all accesses to OncoLink is maintained. While the user remains anonymous, the log contains the Internet address, the resource requested, and the time of each request. This log is a very important and powerful aspect of information publishing on the Internet, providing passive feedback to OncoLink's authors and maintainers. In addition to furnishing statistics about OncoLink's most popular resources and the time interval and path between hypertext requests, the log provides insight into the kinds of information sought, what portions of a document were viewed, and how much time was spent on each section of a document.

While World-Wide Web clients are fantastic browsing tools, OncoLink users frequently read only about 10 percent of large documents (more than 10 printed pages), tightly focusing their attention on specific questions. They peruse the documents in a vertical fashion, moving by hypertext links from one document to another. This is very different from the more conventional mode of sequential reading from beginning to end found both in print media and through using Gopher software.

Recognizing the potential of learning through interconnected images, sound, and text in a hypermedia presentation, services like OncoLink are likely to expand into the arena of interactive television—furthering the University's educational mission and making it a front-runner on the information superhighway.