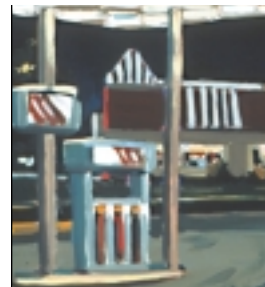


ONCOLOGY JOURNALS AND THE INTERNET: A SHARED RESOURCE

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Introduction

The Internet has many beneficial implications for electronic journals. Electronic dissemination via either e-mail or the World Wide Web allows for wider availability of the contents of specialized, limited-circulation publications such as oncology journals.¹ The ability to click from an abstract or citation to the full text of an article on the Internet is changing the way journals are used and perceived by readers. This new approach to sharing important and updated information appears in various electronic formats — as *print online journals* that reflect all or part of their print counterparts, as *e-journals* that are published solely on the Internet, and as *e-prints*, in which articles are posted without (or before) undergoing the traditional peer-review process. Each of these formats has advantages and disadvantages that are both unique and similar, as described below.

What Are Print Online Journals?

Print online journals are developed as alternatives, supplements, or replicas of their corresponding print journals. Electronic replicas of print journals have the same sections, issues, and page numbers, and each includes a picture of the cover.² The information can be downloaded or printed. The majority of electronic journals are in this form. In some instances, however, the electronic version may include only some of the sections found in the print version or may include

additional sections not found in the print version. Some publishers offer more than editorial articles on their Websites. Examples include *Nature's* International Grants Finder and *Science's* Next Wave (which offers GrantsNet with support from the Howard Hughes Medical Institute). *Science's* Enhanced Perspectives provides an overview of recent research and includes hyperlinks to Websites of other relevant information. Tables 1-4 present a selection of oncology-related electronic journals that are currently available.

Advantages of Print Online Journals

Print online journals can be remotely accessed through the World Wide Web. They are interactive, meaning they can be linked with other media such as sound and video, thus creating an interactive multimedia presentation. Journals on the Web can be easily and quickly searched via keywords, abstracts, authors, titles, and issue numbers. An online discussion among peers about an article that appears in a particular issue can be immediate. With print versions, readers must wait for the printed editorials and replies. When an error occurs, readers may remain unaware of the erratum until it appears in the next print version, whereas an error can be corrected quickly in an electronic version.

The reference section or other areas in an electronic article can link to the corresponding source on the Internet. This means that if another article or author is refer-

enced within an article, it is possible to link to the citation or even to the full text. In many cases, an electronic issue appears on the Internet before the printed version gets to its readers via the postal mail.

Electronic versions provide another advantage in relation to continuing medical education. Electronic journals that offer CME online offer the reader the option of completing the test without mailing or faxing — and often with instant notification of the score.

Disadvantages of Print Online Journals

Print online journals are a relatively new concept, and libraries, publishers, subscription vendors, and readers are still working on their intricacies. Electronic journals come in many formats such as PDF and RealPage; this means that users must have the correct corresponding software installed on their computers to view the article. Most of the additional software required to view full-text articles is

available on the Internet to download without charge. However, the user must know how to download and use the software. Although most publishers provide instructions or links to the instructions, the ability of the users to easily comprehend these instructions may vary considerably.

A print online journal can appear on more than one site on the Internet. Full-text journals may be found on the Websites of the publisher, database vendors, the sub-

Table 1. — Selected Listing of Free Full-Text Electronic Oncology Journals With Unlimited Access

Title	URL	Table of Contents Available Free	Publisher
CA-A Cancer Journal for Clinicians	http://www.ca-journal.org/	✓	Lippincott Williams & Wilkins
Cancer Control: Journal of the Moffitt Cancer Center	http://www.moffitt.usf.edu/ccjournal/index.html	✓	H. Lee Moffitt Cancer Center & Research Institute
Cancer Treatment Reviews ^a	http://journals.harcourt-international.com/wbs/ctr/	✓	WB Saunders
European Journal of Cancer	http://oxford.elsevier.com/cgi-bin/JAO/C-/pass?EJCA/		Elsevier (free trial in 1999 but requires registration for password)
Journal of Clinical Oncology ^b	http://www.jco.org/	✓	Lippincott Williams & Wilkins
Managed Care & Cancer ^d	http://www.cancernetwork.com/		PRR Inc - Huntington
Neoplasia	http://www.neoplasia.org/index.html	✓	Stockton Press
Nutrition and Cancer ^c	http://oncology.medscape.com/LEA/NutritionCancer/public/NC-journal.html	✓	Lawrence Erlbaum
Oncology ^{a,d}	http://www.cancernetwork.com/		PRR Inc - Huntington
Oncology Issues ^c	http://oncology.medscape.com/ACCC/OncIssues/public/journal.OncIssues.html	✓	Association of Community Cancer Centers
Primary Care & Cancer ^d	http://www.cancernetwork.com/		PRR Inc - Huntington

^aOnly back issues are free full text.
^bBecame full text online July 1999 and will remain free until November 1999, when only print subscribers will have access to the online version.
^cAvailable free through Medscape, but users must register first.
^dAvailable free through the Cancer Information Network Website; registration is required from oncology professionals.

Table 2. — Selected Listing of Full-Text Electronic Oncology Journals That Are Free With a Print Institutional Subscription

Title	URL	Table of Contents Available Free	Publisher
Acta Oncologica	http://www.scup.no/journals/en/j-457.html	✓	Scandinavian University Press
Anti-Cancer Drug Design	http://www3.oup.co.uk/antcan/	✓	Oxford University Press
Cancer	http://www.canceronline.wiley.com/	✓	John Wiley & Sons
Carcinogenesis	http://www.carcin.oupjournals.org/	✓	Oxford University Press
Clinical Oncology	http://link.springer.de/link/service/journals/00174/index.htm	✓	Springer-Verlag
Genes, Chromosomes and Cancer	http://www.interscience.wiley.com/jpages/1045-2257/	✓	Wiley-Liss
Gynecologic Cancer	http://www.academicpress.com/gyn/	✓	Academic Press
Hematological Oncology	http://www.interscience.wiley.com/jpages/0278-0232/	✓	John Wiley & Sons
International Journal of Cancer ^a	http://www.interscience.wiley.com/jpages/0020-7136/	✓	John Wiley & Sons
International Journal of Radiation Biology	http://www.tandf.co.uk/journals/TF/09553002.htm		Taylor & Francis
Japanese Journal of Clinical Oncology	http://www3.oup.co.uk/jjco/	✓	Oxford University Press
Journal of the National Cancer Institute	http://jnci.oupjournals.org/	✓	Oxford University Press
Journal of Surgical Oncology	http://www.interscience.wiley.com/jpages/0022-4790/	✓	John Wiley & Sons
Medical and Pediatric Oncology	http://www.interscience.wiley.com/jpages/0098-1532/	✓	John Wiley & Sons
Molecular Carcinogenesis	http://www.interscience.wiley.com/jpages/0899-1987/	✓	John Wiley & Sons
Pediatric Hematology and Oncology	http://pinkerton.bham.ac.uk/titles/08880018.htm	✓	Taylor & Francis Inc
Psycho-Oncology	http://www.interscience.wiley.com/jpages/1057-9249/	✓	John Wiley & Sons
Radiation Oncology Investigations	http://www.interscience.wiley.com/jpages/1065-7541/		John Wiley & Sons
Sarcoma	http://www.carfax.co.uk/sar-ad.htm	✓	Carfax Publishing
Seminars in Cancer Biology	http://www.academicpress.com/semcancer/	✓	Academic Press
Seminars in Surgical Oncology	http://www.interscience.wiley.com/jpages/8756-0437/	✓	John Wiley & Sons
Teratogenesis, Carcinogenesis and Mutagenesis & Sons	http://www.interscience.wiley.com/jpages/0270-3211/	✓	John Wiley

^aIncludes International Journal of Cancer, Predictive Oncology.

Table 3. — Selected Listing of Electronic Full-Text Oncology Journals Available for Extra Charge With Print Subscription, Online Subscription Only, or Pay-Per-Article

Title	URL	Table of Contents Available Free	Publisher
American Journal of Clinical Oncology	http://amjclinicaloncology.com		Lippincott Williams & Wilkins (available online via OVID)
Annals of Oncology	http://www.wkap.nl/journalhome.htm/0923-7534	✓	Kluwer Academic Publishers
Angiogenesis	http://www.wkap.nl/journalhome.htm/0969-6970	✓	Kluwer Academic Publishers
Antimicrobial Agents and Chemotherapy	http://aac.asm.org/	✓	American Society for Microbiology
BBA-Reviews on Cancer	http://www1.elsevier.com/journals/roco/Menu.html		Elsevier Science
Bone Marrow Transplantation	http://www.stockton-press.co.uk/bmt/	✓	Stockton Press
Breast Cancer Research and Treatment	http://www.wkap.nl/journalhome.htm/0167-6806	✓	Kluwer Academic Publishers
Bulletin du Cancer	http://www.john-libbey-eurotext.fr/en/revues/bdc/revue.htm		John Libbey Eurotext
Cancer Biotherapy and Radiopharmaceuticals	http://www.liebertpub.com/cdd/	✓	MaryAnn Liebert
Cancer Chemotherapy and Pharmacology	http://link.springer.de/link/service/journals/00280/index.htm	✓	Springer-Verlag
Cancer Detection and Prevention	http://www.blackwell-science.com/products/journals/xcdp.htm	✓	Blackwell Science (available online via OVID)
Cancer Gene Therapy	http://www.stockton-press.co.uk/cgt/		Stockton Press
Cancer Genetics and Cytogenetics	http://www.elsevier.com/locate/cancergene	✓	Elsevier Science
Cancer Immunology Immunotherapy	http://link.springer.de/link/service/journals/00262/index.htm	✓	Springer-Verlag
Cancer Journal from Scientific American	http://www.scientificamerican.com/marketplace/mrkt_medical/sacancer.html		Scientific American (available online via MD Consult)
Cancer Letters	http://www.elsevier.com/locate/canlet	✓	Elsevier Science
Cancer and Metastasis Reviews	http://www.wkap.nl/journalhome.htm/0167-7659	✓	Kluwer Academic Publishers
Cancer Nursing (available online via OVID)	http://www.nursingcenter.com/journals/	✓	Lippincott Williams & Wilkins
Cancer Practice	http://www.cancer.org/bookstore/cancerprac.html	✓	Blackwell Science
Cancer Strategy	http://www.stockton-press.co.uk/cs/	✓	Stockton Press
Chemotherapy	http://www.karger.ch/journals/che/che_jh.htm	✓	S. Karger AG
Current Opinion in Oncology	http://www.com/store/products?1040-8746	✓	Lippincott Williams & Wilkins (available online via OVID and BioMedNet)

Table 3. — Selected Listing of Electronic Full-Text Oncology Journals Available for Extra Charge With Print Subscription, Online Subscription Only, or Pay-Per-Article (*continued*)

Title	URL	Table of Contents Available Free	Publisher
European Journal of Cancer Care	http://www.blackwell-science.com/products/journals/ejcc.htm	✓	Blackwell Science (available online via Synergy)
European Journal of Surgical Oncology	http://journals.harcourt-international.com/wbs/jso/	✓	WB Saunders (available online via Ideal)
GI Cancer	http://www.gbhap.com/journals/396/396-top.htm		Gordon & Breach (available online via BioMedNet)
Hematology/Oncology Clinics	http://www.wbsaunders.com/catalog/wbs-prod.pl?0889-8588	✓	WB Saunders (available online via MD Consult)
International Journal of Gynecological Cancer	http://www.blackwell-science.com/products/journals/xijgc.htm	✓	Blackwell Science (available online via Synergy)
International Journal of Oncology, Biology, Physics	http://www.elsevier.com/locate/ijrobp	✓	Elsevier Science Radiation
Invasion and Metastasis	http://www.karger.ch/journals/iam/iam_jh.htm	✓	S. Karger AG
Investigational New Drugs	http://www.wkap.nl/journalhome.htm/0167-6997	✓	Kluwer Academic Publishers
Japanese Journal of Cancer Research	http://www.elsevier.com/locate/japjcanres	✓	Elsevier Science
Journal of Neuro-Oncology	http://www.wkap.nl/journalhome.htm/0167-594X	✓	Kluwer Academic Publishers
Journal of Oncology Pharmacy Practice	http://www.stockton-press.co.uk/jopp/		Stockton Press
Journal Pediatric/Hematology Oncology	http://www.aspho.org/journal/journals/308/308-top.htm	✓	Lippincott Williams & Wilkins (available online via OVID)
Leukemia and Lymphoma	http://www.gbhap.com/	✓	Harwood Academic (available online via Ingenta)
Lung Cancer	http://www.elsevier.com/locate/lungcan	✓	Elsevier Science
Medical Oncology	http://www.stockton-press.co.uk/mo/	✓	Stockton Press
Oncogene	http://www.stockton-press.co.uk/onc/	✓	Stockton Press
Oncology (Karger)	http://www.karger.ch/journals/ocl/ocl_jh.htm	✓	S. Karger AG
Pathology and Oncology Research	http://journals.harcourt-international.com/wbs/por.htm	✓	WB Saunders (available online via Ideal)
Radiotherapy & Oncology	http://www.elsevier.com/locate/radonc	✓	Elsevier Science
Supportive Care in Cancer	http://link.springer.de/link/service/journals/00520/index.htm	✓	Springer-Verlag
Tumor Biology	http://www.karger.ch/journals/tbi/tbi_jh.htm	✓	S. Karger AG
Tumor Targeting	http://www.stockton-press.co.uk/tt/	✓	Stockton Press

Table 4. — Selected Listing of Electronic Oncology Journals Without Full Text on the Internet

Title	URL	Table of Contents Available Free	Publisher
Annals of Surgical Oncology	http://www.annalssurgicaloncology.com/	✓	Lippincott Williams & Wilkins
Anti-Cancer Drugs	http://lww.com/store/products?0959-4973		Lippincott Williams & Wilkins
British Journal of Cancer	http://www.churchillmed.com/journals/BJC/jhome.html	✓	Churchill Livingstone
Cancer Biochemistry Biophysics	http://www.gbhap.com/journals/190/190-top.htm		Gordon & Breach
Cancer Epidemiology, Biomarkers and Prevention	http://www.aacr.org/2000/2100/2130/2130.html	✓	American Association for Cancer Research
Cancer Investigation	http://www.dekker.com/e/p.pl/0735-7907?frame=main	✓	Marcel Dekker Inc
Cancer Research	http://www.aacr.org/2000/2100/2110/2110.html	✓	American Association for Cancer Research
Cancer Research, Therapy and Control	http://www.gbhap.com/journals/371/371-top.htm		Gordon & Breach
Cell Growth & Differentiation	http://www.aacr.org/2000/2100/2120/2120.html	✓	American Association for Cancer Research
Clinical Cancer Research	http://www.aacr.org/2000/2100/2140/2140.html	✓	American Association for Cancer Research
Clinical Journal of Oncology Nursing	http://www.allenpress.com/catalogue/index/clin_j_of_onc_nursing/index.html		Allen Press Inc
Critical Reviews in Oncogenesis	http://www.begellhouse.com/cron/cron.html	✓	Begell House Inc
Current Problems in Cancer ^a	http://www1.mosby.com/periodicals	✓	Mosby
European Journal of Cancer Prevention	http://lww.com/store/products?0959-8278		Lippincott Williams & Wilkins
Journal of Environmental Pathology, Toxicology and Oncology	http://www.begellhouse.com/jepto/jepto.html	✓	Begell House Inc
Journal of Immunotherapy	http://lww.com/store/products?1053-8550		Lippincott Williams & Wilkins
Leukemia Research	http://www.elsevier.com/locate/leukres	✓	Elsevier Science
Melanoma Research	http://lww.com/store/products?0960-8931		Lippincott Williams & Wilkins
Oncology Times	http://lww.com/store/products?0276-2234		Lippincott Williams & Wilkins
Seminars in Oncology	http://www.wbsaunders.com/catalog/wbs-prod.pl?0093-7754	✓	WB Saunders
Seminars in Radiation Oncology	http://www.wbsaunders.com/catalog/web-prod.pl?1053-4296	✓	WB Saunders
Seminars in Urologic Oncology	http://www.wbsaunders.com/catalog/wbs-prod.pl?1081-0943	✓	WB Saunders
Surgical Oncology ^b	http://www.elsevier.com/locate/suronc	✓	Elsevier Science
Surgical Oncology Clinics of North America	http://www.wbsaunders.com/catalog/wbs-prod.pl?1055-3207	✓	WB Saunders
Urologic Oncology	http://www.elsevier.com/locate/urolonco	✓	Elsevier Science

^aURL is too long to list; navigate to journal site from the publisher's homepage.

^bTable of Contents via email only at this time, not on the Web.

scription vendors, and/or an aggregator (eg, Ideal, BioMedNet, Ingenta). A URL (Universal Resource Locator) is basically an address used to locate a site on the Internet. However, locating a journal's URL can be confusing or frustrating.

Password requirements also present some frustration to users. Each electronic publisher has its unique way of allowing subscribers access to its journals. Some use passwords, and others provide access via IP addresses (ie, access is available only to computers within an institution that has paid a fee for online availability). Recalling numerous different passwords for electronic journals can be frustrating the reader. However, an institution's medical library Web pages and/or the library's online catalog could avoid the need for passwords by providing a direct link to various journal URLs along with brief instructions for

using the Website of a particular journal or that of a database vendor's journal.

What Are E-Journals?

E-journals do not have a corresponding print version. They exist solely in digital format on the Internet and are not always published by traditional publishers. However, full-text journals on the Internet are often referred to as *online*, *electronic*, and *e-journals* almost interchangeably. The clarifying difference between print online journals and e-journals is that the e-journal's format is available only as an electronic version from submission to publication. E-journals have evolved in part as a result of a "serials crisis" (ie, subscription prices continue to rise beyond library budgets).³ Generally, e-journals are free to the reader, with the only requirement being accessibility to the Internet (Table 5). Fees

for e-journals generally are low because their reproduction and distribution costs are greatly reduced. However, upfront costs can be the same or even higher than costs associated with print publishing.

Some e-journals have editorial boards and undergo the peer-review process. However, the peer-review format may differ from the traditional process.

Advantages of E-Journals

E-journals are user-friendly either by e-mail or by the Web, and they are easily searchable with the search engines in place today. E-journals also allow for more publishing by authors, whereas traditional journals have limited space and capacity. More articles can be published in e-journals, and those articles can be longer because e-journals are not limited by the physical constraints of print jour-

Table 5. — Selected Listing of E-Journals^a

Title	URL
Columbia Earthscape	Coming autumn 1999
Electronic Journal of Oncology	http://ejo.univ-lyon1.fr/
Medscape General Medicine ^b	http://hiv.medscape.com/Medscape/GeneralMedicine/journal/public/mgm.journal.html
Medscape HIV/AIDS ^b	http://hiv.medscape.com/Medscape/HIV/journal/public/HIV-journal.html
Medscape Mental Health ^b	http://psychiatry.medscape.com/Medscape/psychiatry/journal/public/mh.journal.html
Medscape Oncology ^b	http://oncology.medscape.com/Medscape/oncology/journal/public/onc.journal.html
Medscape Orthopaedics and Sports Medicine ^b	http://orthopedics.medscape.com/Medscape/OrthoSportsMed/journal/public/mos.journal.html
Medscape Respiratory Care ^b	http://respiratorycare.medscape.com/Medscape/RespiratoryCare/journal/public/mrc.journal.html
Medscape Women's Health ^b	http://womenshealth.medscape.com/medscape/WomensHealth/journal/public/wh.journal.html
PhysChemComm	http://www.rsc.org/is/journals/current/PhysChemComm/pccpub.htm
Psycoloquy	http://www.cogsci.soton.ac.uk/cgi/psyc/newpsy

^aNot all are oncology related.
^bMedscape Editor in Chief is George D. Lundberg, MD, former editor of *JAMA*.

nals. Traditional journals are slow to publish, and articles may be outdated by the time they appear. E-journals speed up the publication process and thus provide an advantage in publishing time-sensitive material.

Some e-journals are also indexed in MEDLINE, a free database provided by the National Library of Medicine (NLM) and composed of abstracts from medical journals used mostly by doctors and researchers. According to the NLM, the number of searches conducted annually on MEDLINE has increased from 7 million to 180 million since 1997 (*USA Today*, July 14, 1999:5D). Examples of electronic-only journals (e-journals) indexed by the NLM are *Women's Health* and the *Online Journal of Current Clinical Trials*. With more than 190 citations, the *Online Journal of Current Clinical Trials* has a

significant impact on the medical field,⁴ especially since it has been published only since 1992 and has no corresponding print version. The journal *Pediatrics* includes original, peer-reviewed research articles in its electronic pages that are not included in the print version of the journal.

Disadvantages of E-Journals

Archiving is a major issue that needs to be resolved with both electronic journals and e-journals. With electronic journals, libraries can subscribe to both print and electronic versions and can archive the printed issue. However, due to cost constraints, some libraries are now subscribing only to online access. Hypertext links (hypertext is an electronic system of cross-referencing) is another issue for both electronic journals and e-journals. Who will maintain

them when URLs change or disappear altogether?⁵

Copyright is yet another issue. The electronic information age has made copyright infringement a concern. However, it is interesting to note that when photocopiers became available, the same was said of print journals. Because an electronic copy is easily duplicated and distributed, it is more important for publishers to restrict access. Currently, publishers and readers enter into a license agreement to regulate how the online journal is used and who can access its content.

Finally, the issues of credibility and prestige affect online publishing: will oncologists and other medical professionals be enticed to publish in e-journals that may lack the prestige associated with print journals that have existed for 300 years?⁶

Table 6. — Selected Listing of E-Prints^a

Title	URL	Notes	Subject Areas
Cognitive Sciences EPrints Archive	http://cogprints.soton.ac.uk/	Modeled and associated with NSF and DOE-supported Los Alamos Eprint Archive.	Biology, computer science, linguistics, neuroscience, philosophy, and psychology
E-Biomed	http://www.nih.gov/welcome/director/ebiomed/ebiomed.htm	In proposal stage by Harold Varmus (director of the US NIH) for free electronic access to biomedical literature.	Biomedical literature
ERA (<i>The Lancet's</i> electronic research archive)	http://www.thelancet.com/newlancet/eprint/index_body.html	Commentary on this new electronic publishing from <i>The Lancet</i> first published 7/3/99. Also launched an e-print server July 1999.	International health
Los Alamos e-print archives	http://www.lanl.gov/	Started in 1991 by Paul Ginsparg.	Physics, astrophysics, quantum physics, condensed matter theory, mathematics, and computer science
Scholar's Forum	http://library.caltech.edu/publications/ScholarsForum/	The CalTech initiative; includes top US universities and is similar to the NIH proposal.	All disciplines

^aNot all are oncology related.

E-Prints

E-prints (electronic preprints and reprints) are versions of articles that have been circulated via the Internet before publication in a peer-reviewed journal.⁷ E-print servers allow these to be available through the Web. In 1991, an e-print server for high-energy physics was established.⁸ This e-print server has been effective for high-energy physics; the server receives approximately 25,000 submissions per month and has 35,000 users per day. It has not led to the downfall of peer review, and peer-reviewed journals are next in line for most e-prints after review and revision. The question is which traditional peer-reviewed journals will publish e-prints? The delay time for agreeing on a publishable version of an article is greatly reduced with e-prints. It remains to be seen if an e-print server in biomedicine or clinical medicine is helpful. Some currently available e-prints are listed in Table 6.

Conclusions

Electronic access is a relatively new trend in this age of information delivery. In 1995, 3% of US physicians were accessing the Internet, 15% in 1996, 32% in 1997, 60% in 1998, and 80% in 1999.⁹ The advantages of this new educational medium — especially faster access to newly generated discoveries and more widespread dissemination of relevant information — make the future of online publications a virtual certainty. In 1992, the *Online Journal of Current Clinical Trials* was considered the first electronic peer-reviewed science journal with graphics and a completely search-

able text.¹⁰ The list has grown since then, and the number of journals becoming available online is continually increasing.

Many health care professionals value the timesaving feature of instant retrieval of articles at their desktops. As a result, electronic publishing will evolve and flourish despite its current academic, legal, and business issues. Librarians, publishers, and subscription vendors will need to recognize and address the issues associated with the complexities of electronic journals.

The number of oncology journals that offer full-text online versions in addition to their print versions will increase. Accessing electronic journals can sometimes be a technical challenge for the reader but can be worth the effort to overcome the individual idiosyncrasies associated with accessing these journals. Electronic communication is becoming more important in oncology and other health-related fields, and it would be advantageous to the health care professional to become familiar with the Internet as an information resource.

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The URLs included in this article do not imply endorsement by Cancer Control or Moffitt Cancer Center. The listings are not exhaustive, and some of the URLs may have been changed. The journals cited in this article were selected randomly from searches

conducted on MEDLINE, Embase, AltaVista, and Ulrich's International Periodicals Directory 1999. Journals that were free full text at the time this article was written may now have a charge, and those that previously did not offer full-text online articles may now offer this service.

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