The value of PubMed and HighWire Press for the busy general practitioner

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Summary

Medical information on the internet is of variable quality. However, busy doctors can keep up to date with reliable information from readily accessible web sites such as PubMed and HighWire Press. PubMed is part of the National Library of Medicine in the USA. It is a useful system for retrieving clinically relevant search results. HighWire Press has a less sophisticated search engine, but is an excellent source for obtaining the full text of journal articles.

Key words: evidence-based medicine, information services, internet.

Introduction

Much has been written about the proliferation of medical information on the internet, and the dubious quality of a high percentage of it. However, many sites have been developed to help people searching for quality, peer-reviewed literature. These include the Cochrane Library and the US National Library of Medicine's PubMed, as well as sites offering full-text access to medical journals, such as Stanford University's HighWire Press and freemedicaljournals.com (http://www.freemedicaljournals.com).

PubMed

Two features of PubMed are of special significance to busy practitioners. *Clinical Queries* allows you to perform a complex search on a topic, without having to devise a complex search strategy. The system automatically applies a filter (a pre-formulated search string) to your search, ensuring that you only retrieve the most clinically relevant results.

LinkOut provides links from your search results to the full text of articles on the internet. While some of these may be available at no cost, most are available at a pay-per-view price from the publisher. Supplying credit card details usually allows immediate on-line access at a cost of US$8–35.

How to use PubMed

The following example demonstrates the use of:

- *Clinical Queries* to find citations of articles discussing the effectiveness of clopidogrel in the treatment of heart attack

- *LinkOut* to obtain the text of some of these articles.

Step 1

Go to PubMed at http://www.ncbi.nlm.nih.gov/PubMed/medline.html

Click on *Clinical Queries* under the heading *PubMed Services*, in the blue panel on the left, to get to the following screen. Enter your subject search on this screen.

Step 2

At this point, it is worth noticing the default selections on the screen, and being aware that you may change these to suit your own search requirements.

There are two filters which may be applied to your query:

- *Clinical Queries using Research Methodology Filters* is the default selection. If you use this one, you will also need to select a category (therapy, diagnosis, aetiology or prognosis), as well as an emphasis (sensitivity or specificity).

- *Systematic Reviews*. Select this option if you wish to limit your retrieval to only systematic reviews and meta-analyses for your search topic.

Step 3

Enter your search topic, and click *Go*.

Behind the scenes a pre-formulated complex search string[†], based on those developed by Haynes[1], is now applied to the topic you have entered. A summary list of your search results will be displayed, showing authors, title and citation for each article, as well as a link to the article abstract.

[†] (clopidogrel AND heart attack) AND (randomised controlled trial [PTYP] OR drug therapy [SH] OR therapeutic use [SH:NOEXP] OR random* [WORD])
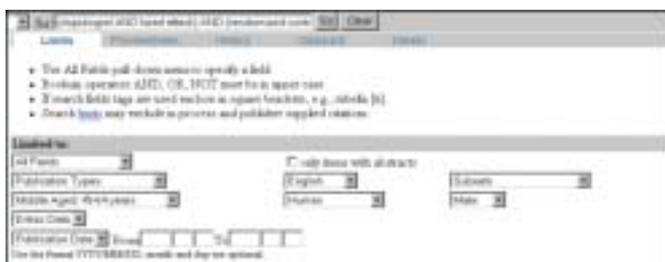
This particular search retrieves just over 100 articles (this number will change as new articles are constantly being added to the database). If this is more than you have time to sift through, consider:

■ changing your selection on the search page to *specificity*, instead of *sensitivity*

■ changing your selection on the search page to *Systematic Reviews* instead of *Clinical Queries using Research Methodology Filters*

■ making use of the *Limits* option.

Using the *Limits* option

This allows you to narrow down your results even further, according to factors such as age group, gender, publication type and language.

It is not necessary to repeat your search. Simply click on *Limits*, select those you wish to apply, and click *Go*.
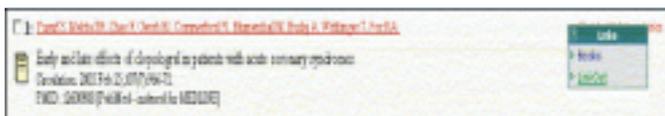
Applying the limits of male, middle aged, human, and English language, narrows down the search results to 17 articles.

Using *LinkOut* to obtain the full text of articles

A click on the author's name, or on the abstract icon, will display the abstract of the article. To access the *LinkOut* feature, click on *Links* (either from the summary display, or the abstract display), then click on *LinkOut*.

You will notice that links are provided under the headings *Education, Literature* and *Medical*, with links to articles coming under the *Literature* heading. Some of these may be freely available. Most will be available on a pay-per-view basis. Click on the link, and follow the instructions if you wish to pay by credit card.

LinkOut also provides links to other useful resources, such as on-line tutorials, and consumer health information from reliable sources such as the National Institutes of Health, the American Heart Association, and MEDLINEplus (the patient information site of the National Library of Medicine).

Related Articles provides a link from any one article, to others in the database which have words from the title, abstract, and MeSH terms in common with that article. These are listed in order of relevance, with the given article listed at the top.

If time permits, it is worth doing the online PubMed Tutorial (at http://www.nlm.nih.gov/bsd/pubmed_tutorial/m1001.html) and/or reading an article on searching the medical literature.[2]

HighWire Press

HighWire Press began in early 1995 with the development of the on-line version of the Journal of Biological Chemistry. The journals Science and Proceedings of the National Academy of Sciences soon joined the site. HighWire currently hosts 335 journals, offering varying degrees of full text access. Articles may be available:

■ free of charge (British Medical Journal)

■ free after a certain time period (Family Practice is free after two years)

■ on a pay-per-view basis (you pay to access one article on-line, for a stipulated time period)

■ with a site pass (you pay to access any articles from a particular journal, for a stipulated time period).

HighWire's search engine does not match the sophistication offered by PubMed. However, HighWire's search capabilities, coupled with the fact that so much of its content is accessible in one way or another, make it a worthwhile tool for the general practitioner who does not have easy access to a medical library.
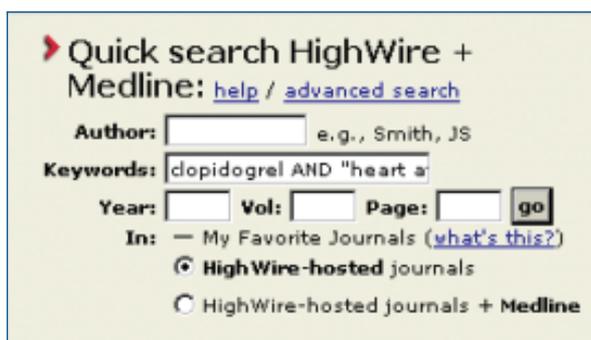
How to use HighWire Press

The following example demonstrates the use of *Quick search* to find citations for articles in which the words clopidogrel and heart attack appear as keywords, and how to obtain the text of some of these articles. There is also an *advanced search* option, and detailed instructions on the use of both search options (on the use of wildcards, stemming, Boolean logic, phrase searching) are available on the screen under *Help* (http://highwire.stanford.edu/help/search_help.dtl#intro).

Step 1

Go to HighWire Press at http://highwire.stanford.edu/

Type clopidogrel AND 'heart attack' in the *Keywords* search field, and click *go*.

This search retrieved 54 results, of which 37 were available free of charge (as with the PubMed search, these numbers will vary as new articles are added to the database). The difference between these results, and those obtained from the PubMed search, is that they do not necessarily have the clinical focus of those obtained from PubMed's *Clinical Queries* filter. Nevertheless, a quick browse through the results is likely to reveal some useful findings.

Step 2

For those results which show that the article is free, you simply click on either the *Full text* or *PDF* link to obtain the article.

For journals which charge for access, click on either the *Full text* or *PDF* link, and follow the instructions to purchase access to the article.

Access to this particular article may be purchased for US$8. If you decide to supply your credit card details, you will be able to view and print the article immediately from your computer.

Conclusion

PubMed and HighWire Press are both excellent examples of the richness of the internet for the medical profession. As PubMed makes it easy to limit search results to those with a clinical focus and HighWire provides ready on-line access to quality peer-reviewed publications from the convenience of your desktop, these two resources complement each other very well. One should not be used in isolation of the other, but rather as part of a suite of tools which help you to retrieve quality information in this era of evidence-based medicine.

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References

1. Haynes RB, Wilczynski N, McKibbon KA, Walker CJ, Sinclair JC. Developing optimal search strategies for detecting clinically sound studies in MEDLINE. J Am Med Inform Assoc 1994;1:447-58.
2. Ebbert JO, Dupras DM, Erwin PJ. Searching the medical literature using PubMed: a tutorial. Mayo Clin Proc 2003;78:87-91.

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