

## KnowledgeShare

# Web alert: searching for journal articles online

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## Introduction

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For this month's web alert column I plan to go back to basics and look at how to find references to healthcare articles and reports online. Many healthcare staff remain confused about this admittedly murky area, due to the wide variety of databases, the various ways of accessing those databases, and the passwords that may or may not be necessary for access.

Staff can save themselves considerable time when searching for clinical information if they begin with the pre-appraised, pre-digested sources. These evidence-based resources include the Cochrane Library, Clinical Evidence, guidelines and journals such as *Evidence-based Medicine*, *Evidence-based Nursing*, and so on. More details about these sites will be found in previous KnowledgeShare columns. If an answer to your clinical question can be found within these collections then you often need look no further, as the work of searching and critical appraisal will have been done. However, the number of questions that can be found here is still relatively small, and for more obscure issues or very recent technologies it will be necessary to investigate the primary research, the original journal articles and reports.

## Essential online databases

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References to journal articles, reports and certain other grey literature (meaning conference proceedings, academic dissertations, and so forth) are collected together in large online resources known as bibliographic databases. Bibliographic databases contain details of the authors, titles, publishers, and dates of publication of these documents, and often include additional information such as an abstract or brief description, the language of publication, and index terms describing the content.

Once a resource has been identified in a bibliographic database, an additional step is always required in order to retrieve the text in full. Sometimes this will be as simple as clicking on a link to an electronic version of the document. However, this is provided firstly that the publisher has made the material available electronically (often, but not always, the case with journal articles), and secondly that you or the organisation you belong to has subscribed to this electronic content. It is still often necessary to get hold of a print copy of the material you have tracked down, by visiting your nearest healthcare library. The practice of only reading material that you can access in full from your desktop is tempting, but far from evidence based, and should be resisted wherever possible.

There are only a handful of key bibliographic databases for healthcare staff to be aware of, but it is important to be aware of them all as their content differs and effective searches will usually require using more than one.

- *British Nursing Index* (BNI): a relatively small database, the BNI contains references to articles from around 250 nursing and midwifery journals, the majority of which are published in the UK.
- *CINAHL*: CINAHL is a much larger database with references dating back to 1982. It too concentrates on nursing and professions allied to medicine, but with an international scope. Around 1000 journals are indexed, and are supplemented by references to pamphlets, books, book chapters, dissertations, audiovisual materials and more.
- *DH-DATA* and the *King's Fund*: these collections of references are produced by the Information and Library Services of the Department of Health and the King's Fund (an independent UK health charity) respectively. Many useful citations of journal articles on health management topics can be found here, but both databases also act as unique repositories of

more ephemeral healthcare publications, such as circulars, reports, pamphlets and local statistics.

- **EMBASE:** Embase, which can be searched from 1974 or 1996 onwards, is a massive and massively undervalued bibliographic database focusing on medicine. There is a particular emphasis on pharmaceutical information, and a bias towards European sources, but with abstracts from around 5000 journals included in the collection, information on most clinical questions can be found here.
- **MEDLINE:** produced by the National Library of Medicine in the United States, Medline naturally concentrates more on American sources, but it is perhaps the most widely used of all healthcare databases. As with Embase, articles from approximately 5000 journals covering the full range of medical specialties are cited, but in this case references go back as far as 1950.
- **PsycINFO:** this database concentrates on psychology and psychiatry, with an emphasis on original research, although some case studies and literature reviews are also included.

## Accessing the databases

All NHS staff in England have access to these databases of published literature through a provider called Dialog (<http://nhs.dialog.com>). Healthcare staff in other locations may find that their access is through a different route, often via a service called Ovid, but the coverage and search functions should be essentially the same. I will concentrate on Dialog for the remainder of this article.

The Dialog website requires an Athens username and password to gain access. Athens is a password system that recognises which organisation you belong to and gives access to the resources that your library service has purchased on your behalf. This is why, if you are used to using an Athens password provided as part of a university course, it is worth obtaining an NHS Athens as well, as the content available will be different. It is simple to register for an NHS Athens password; go to the website [www.athens.nhs.uk](http://www.athens.nhs.uk), click on 'Self-registration' and complete the online form. It is best to do this from an NHS-linked computer (if possible) as you will then receive the password immediately.

At the Dialog site, choose 'Search databases', and after logging in you will be presented with a screen showing the various databases listed above. For simple, quick searching, check the boxes next to the databases you are interested in and select the 'Easy search' button. This allows you to search across multiple databases on up to three terms at a time, and you can specify which field(s) you want to search

in, for example, author, title, abstract, journal name, or for words found anywhere in the reference. Searching in this way can be relatively speedy, but for more accurate (i.e. evidence-based) searching, it is worth spending a little more time and using the advanced search facilities.

## Advanced searching on Dialog

To take advantage of the full range of search tools on Dialog, click on the 'advanced search' button next to your preferred database (you can only search one database at a time with this method, but there is the opportunity to combine your searches at the end). It is best to search on individual concepts in turn, so if, for example, your question was: 'How effective is behaviour therapy in aggressive adults with autism?', you may want to search separately for: 'autism', 'behaviour therapy', 'aggression' and perhaps 'adult' as well.

The advantage of giving each of these concepts its own search step is that you can then search for synonyms (such as 'violence' for 'aggression') and Americanisms (e.g. 'behavior' for 'behaviour'), and then combine everything in various ways until you are happy with the results. This method allows your searching to be more flexible and makes it easier to add or remove terms as you go. It is also worth being aware of a concept called *truncation*, which allows you to search for similar words together; in Dialog the truncation symbol is '\$' so by searching on the term 'autis\$' you will automatically include articles with the word 'autism' as well as those with the word 'autistic'. Do use truncation with caution though as searching for 'aut\$' will include 'autism' and 'autistic' but also 'author', 'automatic' and 'automobile'!

Terms can then be combined using the logical operators 'AND' and 'OR'. Our example might look something like this:

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autis$ AND (behaviour therapy OR behavior therapy)
AND (violence OR aggression)
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As a general rule, use 'OR' and bracketing to combine similar terms or synonyms (thus broadening your search), and use 'AND' to combine the various key concepts (to achieve a narrower, more specific set of results).

More accurate searches can be achieved through the use of *subject headings* also known as descriptors or index terms. These are used to solve two opposing problems. The first is that sometimes the citation of a document will include a word which is rather tangential to the main thrust of the article, which leads to irrelevant search results. For example, the above search in Medline on Dialog retrieves 23 articles, four

of which concentrate on pharmacotherapy, rather than behaviour therapy, for aggression in autism. These four are picked up because the citations include the phrase 'behaviour therapy' somewhere within them, even though they are not primarily about this intervention. The second problem is that important articles will be missed if the author used a synonym, acronym, Americanisation, or alternative terminology that you haven't thought of. Using the same example, we would have missed any articles that referred to 'behaviour modification' rather than 'behaviour therapy'.

In order to improve sensitivity (the proportion of useful articles that are retrieved) and specificity (the proportion of irrelevant articles that are correctly ignored) each document is assigned subject headings that describe its content. In Medline, the subject heading of 'Behavior-therapy' will only be added to those articles that are primarily about behaviour therapy, and it will be added whether the authors have used the English spelling, the American spelling, or other similar terms, such as behaviour modification. In this way, searching for articles that have been assigned this subject heading can radically improve the accuracy of a search. To do this in practice, check the 'Thesaurus mapping' box when you search, and you will be presented with a list of relevant subject headings. Select the one that seems appropriate and search again.

There is a little more that can be said about subject headings. When selecting a subject heading you will see the option to 'explode' it; this is a way of automatically including all narrower terms in your search. 'Exploding' the term 'Behavior-therapy' will retrieve additional articles that are described by the terms 'Aversive-therapy', 'Relaxation-techniques', and other terms that are considered to fall under the heading of behaviour therapy. Other options include narrowing the search to only those articles that have the term as a 'major descriptor' (where the term is the main focus of the article), or narrowing by a subheading, e.g. drug therapy, diet therapy, nursing, etc.

Although searching using subject headings can seem complex at first, searchers who become familiar with the technique will begin to find themselves much happier with their results and more confident that they haven't missed anything important. It is often best to combine subject headings with free-text searching (as seen above) if you have time. Finally, you may want to limit your results, either by age group, year of publication, language of publication, or document type. Many of the databases in Dialog allow you to limit the search to only retrieve guidelines, systematic reviews, or clinical trials, which can be a useful way to focus your results if the number retrieved is too great.

Once you have completed the search in one database, switch to another from the list by clicking on the 'databases' button. All your steps will be retained, and once you have searched again on the new database you can automatically combine the results and remove any duplicates that have been found in both collections. Do this using the 'remove duplicates' button. You may want to search Medline and Embase, or CINAHL and BNI, or some other combination.

## PubMed [www.ncbi.nlm.nih.gov/entrez](http://www.ncbi.nlm.nih.gov/entrez)

PubMed is another site that allows access to the Medline database. It is currently more popular than Dialog, mostly due to the fact that it is freely accessible without the need for a password. There are also a number of additional search features that I will cover in a moment. As with Dialog, searches can be built up concept by concept, and the same limits and subject headings are available (although using them can seem more complicated). In fact PubMed is designed so that a simple search will have these subject headings appended automatically, 'behind the scenes', presumably in order to improve the search results. Unfortunately this can lead to some confusing results and irritation, especially if you need to build up a careful search strategy.

A useful function of PubMed is the set of 'Clinical queries' search filters, which can be selected from the menu bar on the left. These allow you to enter search terms as usual, but narrow the results down by study design so that only the higher-quality articles are retrieved. Essentially this works by looking for randomised controlled trials to answer a question about therapy, cohort studies to answer questions about risk, and so on. Using these is a quick way of homing in on the best studies to solve your particular problem. Once you have found a useful article, there is also the option to search again for 'Related articles', although again it's not clear how these are found. Useful if you just need one or two articles but no good if you want to feel confident about the sensitivity and specificity of results.

The major drawback of PubMed is that it is restricted to the Medline database and ignores the many thousands of references collected elsewhere. In addition, the links to full-text articles can be confusing. Often when following a link from PubMed you will be asked to pay for access to the full journal articles, even when it may be that your local NHS library service already subscribes.

## Full-text journal articles

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As mentioned earlier, not all journals are available electronically, and of those that are, not all have been purchased by the NHS. However, there is online access to around 1500 journal titles that has been purchased by the NHS nationally, and individual trust libraries may have supplemented these with their own subscriptions. In some cases PubMed may be aware of these subscriptions (the links to NHS content from PubMed are still a relatively new feature), and direct links from within Dialog should also work fairly well. The only foolproof way at the moment to find out whether you should or should not have access to a particular article online is to contact your local NHS library service, or check their online catalogue, if one is available.

## Conclusion

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A lot of emphasis is placed on being able to search the literature rapidly and find answers to patients' questions on the spot. Unfortunately, this seems to be an almost unachievable task. The evidence-based sources

listed in my introduction are incredibly useful up to a point, but searching beyond these, while retaining an evidence-based approach, takes time. Hopefully the techniques listed here will help to speed up your searching of the primary literature, and to improve the accuracy of your results. Of course, if you do feel unsure about getting the best out of Medline, Cinahl, and the rest, there will almost certainly be local hands-on courses available from your library, which should be able to increase your confidence further.

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