

Original Articles: Reviews & Experimental

Searching for the Evidence: A Practical Guide to Some Online Databases in Chiropractic and Osteopathy

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Abstract

Background:

Chiropractic and Osteopathy are categorised within the family of Complementary and Alternative Medicine (CAM) by most indexers and database managers. CAM therapies can be difficult to search because relevant resources are spread over a number of databases.

Objective:

This paper aims to introduce basic searching skills for six databases which offer CAM literature.

Methods:

Six readily available databases which can be used by a busy clinician to remain informed about best practice were chosen. The databases were searched and compared using two clinical scenarios as sample searches.

Discussion:

Evidence-based practice demands that practitioners maintain their information gathering skills, but no one source provides all the answers. We are lured by the thought that everything is available on the web easily and speedily, but may sacrifice quality for ease and speed of retrieval.

Key Indexing Terms

Databases, Bibliographic; Complementary Therapies; Information Storage and Retrieval.

Spot Check

- Knowing how to search for and find clinical evidence is critical to good clinical practice.
- Generic search skills described in this paper can be transferred to new and/or different databases.
- Practice with these easily accessible databases will help make your database searches more productive and useful.

Introduction

A recent model for evidence based clinical practice¹ overlays clinical expertise on the three considerations of clinical state and circumstances, research evidence, and patient preferences and actions. It serves to reinforce the importance of the chiropractor or osteopath being responsible for their clinical decisions. Basic to their clinical decision-making is the assumption that the practitioner possesses skills in framing questions, in finding evidence and in being able to critically appraise the literature in order to decide whether it should influence their practice.

As knowledge grows in an exponential way in these areas, practitioners need to maintain and apply information gathering skills for evidence-based practice (EBP). The

sources of evidence are many. They include books, journal articles, databases, reports and articles published as web files (grey literature), colleagues, continuing education and post-graduate courses. This paper focuses only on the literature (mainly journal articles) available in six online web databases which are readily available and can, with a little practice, be used to support your work.

We are lured by the thought that everything is available on the web easily and speedily, but can easily sacrifice the quality of information for speed of full text retrieval unless we know how to find and evaluate what we need. Also, some health fields and disciplines are covered more comprehensively than others.

Chiropractic and osteopathy now are more comprehensively indexed in databases, but this indexing is not always complete or consistent. Opinions can differ with regard to the place of chiropractic and osteopathy in the family of Complementary and Alternative Medicine (CAM)², but for the purposes of this paper and in the view of most indexers and database managers they are considered as part of the CAM group of therapies. Even information specialists accept that conducting a comprehensive search of CAM literature can be challenging³, as no one source provides all the answers or can be searched in the same way as any other.

Five of the online databases were chosen for this paper because they are easy to access and open for public use on

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the Internet. They are the Cochrane Library, Medline, Index to Chiropractic Literature (ICL), Ostmed and PEDro. The paper also describes one fee-paying database (MANTIS) which has the potential to provide a comprehensive coverage of the manipulative therapies and was included because it retrieved many useful articles in a recent review³. Detailed help files are available from each database's website and explain each database's strengths more thoroughly than this paper can. Their web addresses and useful contact emails for help are listed at the end of this paper in Box 7.

First Things First

There are a number of simple things to remember which will make your searching more successful and productive.

- Know why you're searching and what you're searching for:
In EBP, this step is called "Asking an answerable question" and involves being clear about the reasons for your search and specifying what it is that you need from your search. This step is made easier by structuring the search strategy to use the Patients, Intervention, Comparator and Outcome (PICO) model.

In this paper we will take two questions which may be asked of a chiropractor or osteopath and demonstrate how you could search for evidence to support your clinical decisions.

Scenario 1

As an osteopath, you have treated a woman for some years who now has approached you for advice about one of her children. The girl has been diagnosed each winter for the last four years with otitis media and each time the condition has been treated with an antibiotic drug. The mother is concerned about the ongoing use of these pharmaceutical preparations and has heard from a friend that osteopathy worked for her child with a similar condition. She asks you to tell her about using osteopathy to treat otitis media and why she should change her child's treatment.

At first glance, it can seem difficult to develop a search strategy from a conversation, but if we break the talk down into the PICO four parts it becomes more manageable.

Patients (Population): Patients with Otitis Media
Intervention: Osteopathic therapy
Comparison: Drug therapy
Outcome: Reduced incidence of infection or reduced period of infection

The **Clinical question** looks like: For patients with Otitis Media (P), is osteopathic therapy (I) or drug therapy (C), more effective in reducing the incidence or period of infection (O)? We will use this question for the Cochrane Library, PubMed and Ostmed searches.

Scenario 2

As a chiropractor you see a number of patients who seek your help to reduce pain in their lumbar spine. You have been approached by a person who is new to your practice for advice about their lumbar spine pain. They ask you to advise them of the benefits of chiropractic over painkillers for their pain.

In this case, you are not only wanting to answer the person but also to develop a search strategy which you can reapply regularly to ensure you remain up to date with the evidence for chiropractic in the treatment of back pain.

Patients (Population): Patients with Lumbar spine pain
Intervention: Chiropractic
Comparison: Drug therapy
Outcome: Reduced pain

The **Clinical question** looks like: For patients with lumbar spine pain (P), is chiropractic (I) or drug therapy (C), more effective in reducing pain (O)? We will use this question for the ICL, PEDro and MANTIS searches.

- Decide which references you will look for depending on the type of question you are asking:
Once you have clarified what you want to know, you can also think about the sort of studies that will best answer your question. The most appropriate evidence will vary depending on the type of question you are asking.

For example, the clinical question can be of the following types⁴;

1. In the case of questions about intervention or therapy, the best clinical evidence would be found in randomised controlled trials.
2. For a diagnosis / screening question; either look for a cohort study or cross-sectional study where all subjects receive both the study test and the gold standard reference test to assess the accuracy of the test; or look for a randomised controlled trial to assess the effect of the test on health outcomes.
3. For an aetiology/risk factors question; either look for a randomised controlled trial, cohort for a common outcome or a case-control study for a rare outcome with common exposure.

4. For a prognosis question; look for a longitudinal cohort.

These four types of questions are often reflected in the way the health databases are organised. For example, they are found in the types of searches that can be done in the clinical queries on PubMed described below. A workbook available from the Centre for Clinical Effectiveness homepage⁴ helps with explaining this process. Also, a recent article on EBP as applied to chiropractic, is useful reading to supplement this paper's introduction to searching for evidence in EBP⁵.

- Make your search terms as specific as possible and try using a thesaurus:

The on-line databases are large and there may be many articles that will discuss any of the concepts that you are interested in. Once you have decided what it is you want to search with your PICO question and the types of studies that you will be looking for, you can prepare your search by thinking of specific terms to describe exactly what you are after and combining these terms in the database.

There are a number of databases which index and describe their records or references in diverse ways⁶. One way of forcing some consistency in indexing and searching is by the use of a controlled vocabulary or thesaurus. With its use, all database references that contain information about a particular topic are indexed or "catalogued" using the same term or subject heading. Then when you search using the subject heading, you can retrieve all the records that contain information about the topic.

Some consistency is achieved in the databases that are covered in this paper, as they all use the Medical Subject Headings (MeSH) vocabulary to varying degrees. MeSH is published and maintained by the US National Library of Medicine and covers all aspects relating to medicine and health care in general. If you search using both keyword/text word terms and MeSH headings you will maximise your chances of retrieving all the relevant records in the databases.

Because the PubMed databases are also published by the US National Library of Medicine, you can find information about MeSH on the PubMed site. (The database demonstrated in Box 2). A number of the other databases described in this paper supplement the MeSH terms with thesaurus terms specific to their discipline. (For example, OSTMED includes an additional list of osteopathy-specific terms).

- Combining search terms:
Database operators (also known as "Boolean" operators) are the main ways of combining the search terms. These allow the search to be broadened or narrowed. The main operators are **OR**, **AND**, and **NOT**.

Use the **OR** operator to combine terms where any of the selected terms may be used to answer your search question. You can join words or phrases using the operator "**OR**" between words or phrases. For example, to find articles that are indexed using either low back pain or sciatica, you could type "low back pain **OR** sciatica" and the database would retrieve articles that included either of the two search terms.

Use the **AND** if you want both terms to be present in the search result. For example, if you enter "headache" in the search field followed by "**AND** manipulation, spinal" the search results will contain only articles including or indexed with, both of those terms.

Using **NOT** excludes articles containing that term or indexed with that heading. For example, if you want to find articles that deal with treatment of low back pain, but not articles that are about surgical methods, you could enter the heading "low back pain **NOT** surgery" in the search field. **NOT** should only be used when you can be sure that relevant articles will not be discarded also.

Most databases also support proximity operators (for example, **NEAR** or **WITH**) which can retrieve records with the specified search terms beside or close to one another. This was found particularly useful for the database OSTMED.

- Truncation or wild card searching:
Adding a wildcard symbol at the end (or sometimes the beginning) of a word will retrieve all terms in the database with the stem of that word. For example, osteopath* will retrieve records with the words *osteopathy*, *osteopath* and *osteopathic* because all the words start with the stem *osteopath*. The symbol may vary between databases, but the databases in this paper all use the * character.
- Find out about the databases' strengths and take them into account when searching:
Each database has been prepared or developed with a different audience in mind and you can get best results by taking this into account. For example, when searching the OSTMED database described below, you do not need to specify osteopathy as a search term because that profession is already the focus of the database.

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- Practise, practise, practise...
The good thing about all but one of the following databases is that there are no additional fees to access them once you are on the web, so you can take time to experiment with the results of your searches. Don't be discouraged if your first attempts don't retrieve what you need. It helps to rethink the terms that you are using, refresh your knowledge of the database by reading its help files and talk about alternative strategies with your colleagues.

The Six Databases

Searching online databases is a practical skill and lends itself to hands-on learning, so the descriptions of the six databases are arranged beside a simple search strategy which you can practise on your own computer. The searches are based on the two clinical questions discussed in the introduction to this paper.


1. The Cochrane Library Issue 1, 2004
(www.cochrane.org.au)

The Cochrane library is a suite of databases which aim to consolidate reliable evidence on different clinical topics in a single source. All residents of Australia with access to the Internet can access The Cochrane Library for free, thanks to funding provided by the Commonwealth Government of Australia and administered by the National Institute of Clinical Studies.

Box 1 - Cochrane Library Search

Web address: <http://www.cochrane.org.au>

Clinical question: For Patients with Otitis Media (P), is osteopathic therapy (O) or drug therapy (C), more effective in reducing infection (O)?



The search will be conducted in all Cochrane databases:

Search	Hits	Full	Abstract
#1 Otitis media in All Fields	1,000	600	600
#2 Otitis media in All Fields AND Otitis media in All Fields	24,000	600	600
#3 Otitis media in All Fields	1,000	600	600
#4 Otitis media in All Fields	0	600	600
#5 Otitis media in All Fields	1	600	600

The search will be conducted in all Cochrane databases:

Search	Hits	Full	Abstract
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#3 Otitis media in All Fields	1,000	600	600
#4 Otitis media in All Fields	0	600	600
#5 Otitis media in All Fields	1	600	600

The use of osteopathic manipulative treatment as adjuvant therapy in children with recurrent acute otitis media. [comment].
Mills MV, Henley CE, Barnes LL, Carreiro JE, Degenhardt BF Year: 2003

It is published on a quarterly basis and is updated with new reviews and further comments on older reviews. Its focus is on intervention or therapy questions.

As the Cochrane library is relatively new and each review is a large undertaking by a number of people, the coverage of all possible health areas is not complete. It does, however, include many CAM topics and is not restricted to medical interests only.

It is worthwhile starting your database searching in the Cochrane library as it comprehensively searches across most other relevant sources for information on clinical evidence. At the top of the hierarchy of databases in the library is the Cochrane Database of Systematic Reviews which provides high quality evidence across a number of topics. If you find a relevant and current systematic review in the Library you can be assured of a good introduction to evidence on that topic.

Box 1 (Cochrane library search) demonstrates the search for Clinical evidence using osteopathy for Otitis Media compared with conventional drug therapies. The Cochrane search interface has changed recently (from Update to Wiley publishers) but two aspects of searching Cochrane are still relevant.

First, consider making control of the search easier by building the search up one term at a time and then combining them by using the search history page as demonstrated in Box 1. That way you can easily include or exclude terms built up in a number of search steps. Second, the search screen displays results separately for all the regularly updated Cochrane databases in the Library and these are detailed at the base of the search screen. By looking at the display you can see that no systematic review was retrieved for this clinical question in Cochrane, but a clinical trial was identified.


2. Medline on PubMed
(www.pubmed.gov)

PubMed, a service of the National Library of Medicine NLM), indexes records back to the 1950's. These citations are largely from MEDLINE - the NLM's premier medical database. PubMed includes links to many sites providing full text articles and other related resources and is often the single search source for clinicians. It contains bibliographic citations and author abstracts from more than 4,600 biomedical journals and is strong in English language journals. It is easily accessed from the web and contains a wealth of health

Box 2 - PubMed Search

Web address: <http://www.pubmed.gov>

Clinical question: For Patients with Otitis Media (P), is osteopathic therapy (O) or drug therapy (C), more effective in reducing infection (O)?



- Limiting the search:** From the top search screen, choose the Limits link and then the subset called Complementary Medicine. This reduces a simple search for "otitis media" from an unworkable number of records across Pubmed (182,87) to those indexed only in the CAM subset (234).
- Clinical queries:** Selecting the clinical queries option on the lefthand bar filters all the Pubmed records for clinical relevance and reduces the number of records in the search to a more clinically relevant 74. "Osteopathy" was added to the search here because the search was across all the health care professions indexed in Pubmed.

The top two records (two most recently added to the database) from the clinical queries search are the Mills article already identified in the Cochrane search and another record by ME Pichichero, Osteopathic manipulation to prevent otitis media--does it work? Arch Pediatr Adolesc Med. 2003 Sep;157(9):852-3.

- Related articles :**

information as well as access to the MeSH vocabulary discussed above.

Box 2 (PubMed search) demonstrates another search for evidence using osteopathy for Otitis Media. PubMed strengths are in the whole field of healthcare so it is important to refine your search results to those most relevant to your clinical questions.

First, you can refine your topic search to an osteopathy focus by using the limits function from the search screen. This will reduce the records to only those from the PubMed CAM subset of references called "Complementary Medicine".

Second, you can refine all the Medline records for Otitis media through a "hedge" or "filter". This filter is an additional search saved in the PubMed database which, when added to your subject search, will increase the clinical relevance of the search results. Apply this filter by clicking on the Clinical queries option which is located in left hand bar on the home page. At the following screen you can choose the type of saved search filter that you want to use with the results in your topic search. In the Box 2 example, you can see that the number of references

to check was made more appropriate to the type of study and to CAM by using the limits and clinical queries options.

Third, once you are able to identify a relevant record (for example, the Mills article), the Related articles feature can expand your search results to match other records covering similar themes which may not have been retrieved in the original search. You use this by clicking on the "related articles" link at the right of the screen displaying your search results. However, remember that choosing this feature will remove the "evidence filter" from your search results.


3. Index to Chiropractic Literature (ICL)

(www.chiroindex.org/index.cfm)

ICL was founded in 1979 and is published as a free service on the web. It indexes all chiropractic peer-reviewed journals, and others based on relevance of the topic. As well as MeSH terms, it indexes the literature using a controlled vocabulary called CHIROSH (Chiropractic Subject Headings). Librarians from chiropractic libraries donate their time to index the journals chosen for inclusion and they are planning to improve its search functions and coverage of clinical literature when time and resources permit.

Box 3 - ICL Search

Web address: <http://www.pubmed.gov>



Clinical question: For Patients with lumbar spine pain (P), is chiropractic (I) or drug therapy (C), more effective in reducing pain (O)?

This search was undertaken on the ICL subjects – the thesaurus/controlled vocabulary in ICL, so at the entry screen Subject (rather than Title word or Author last name) was chosen as the type of search.

1. Subject: BACK PAIN	(773)
2. Subject: CLINICAL TRIALS	(17)
3. Subject: REVIEW LITERATURE	(13)
4. Subject: EVIDENCE BASED CHIROPRACTIC	(13)
5. Subject: EVIDENCE BASED MEDICINE	(13)

Set #1 was combined with sets #2-#5.

6. Set 2 OR Set 3 OR Set 4 OR Set 5	(52)
7. Set 1 AND Set 6	(6)

Related Citations

Journal	Article Title	Authors
CHIROPRACTIC
CHIROPRACTIC
CHIROPRACTIC
CHIROPRACTIC
CHIROPRACTIC
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Box 3 (ICL search) demonstrates a search for the evidence about manipulative therapy for low back pain. The sample search is built up in simple steps. As an index, ICL displays citations details but not abstracts, and it is not yet possible to search by type of publication such as a “Clinical trial”.

ICL advise using simple search strategies and that, as yet, few records indexed for EBP exist in ICL. They advise the use of ICL to complement searches on other databases - both the ones reviewed in this paper and subscription databases such as Alt-Health Watch (which provides coverage of 200 therapies, modalities and perspectives addressed by integrated medicine) and CINAHL (the Cumulative Index to Nursing and Allied Health Literature). Another suggestion from the ICL helpdesk was for clinicians to review the ICL list of peer-reviewed journals and use that as a criterion for relevance.

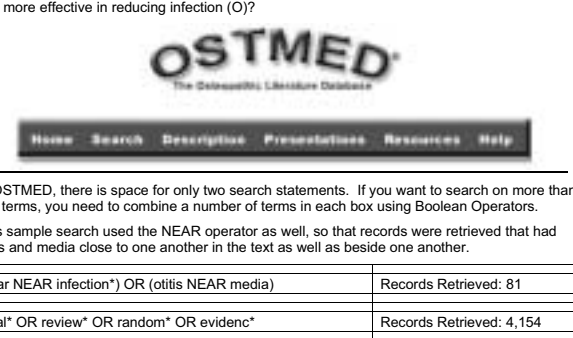
- OSTMED
(ostmed.hsc.unt.edu/ostmed/home.htm)
OSTMED indexes osteopathic literature stretching back 100 years. It also supplements the MeSH thesaurus with a thesaurus of unique osteopathic terms which enhances searching.

Box 4 (OSTMED search) demonstrates another search for evidence using osteopathy for Otitis Media. Like

Box 4 - OSTMED Search

Web address: <http://ostmed.hsc.unt.edu/ostmed/search.htm>

Clinical question: For Patients with Otitis Media (P), is osteopathic therapy (O) or drug therapy (C), more effective in reducing infection (O)?



In OSTMED, there is space for only two search statements. If you want to search on more than two terms, you need to combine a number of terms in each box using Boolean Operators.

This sample search used the NEAR operator as well, so that records were retrieved that had otitis and media close to one another in the text as well as beside one another.

(ear NEAR infection*) OR (otitis NEAR media)	Records Retrieved: 81
trial* OR review* OR random* OR evidenc*	Records Retrieved: 4,154

When the two search sets were combined with AND 17 records were retrieved.

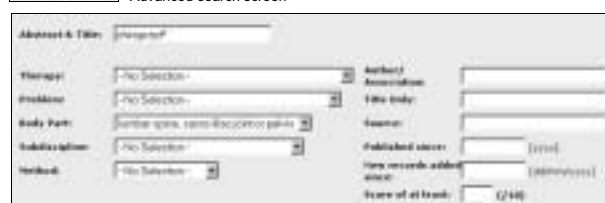
Rank	Title	Source	Full Text
1*	1991-1999 Otitis Media Case of recurrent left paranasal sinusitis, otitis media with effusion, and otitis externa (Review)	Am J Clin Ther. The Journal of the American Osteopathic Association 2002 Aug;13(5):457-460. you:459-460	Full
2*	1991-1999 Mikell, Robert G., James L.G., Gentry, D., Swanson, D.J. and Worley, E. Effect of chiropractic manipulation of the cervical spine on otitis media with effusion (Review)	Am J Clin Ther. The Journal of the American Osteopathic Association 2002 Aug;13(5):448	Full
3*	1991-1999 Otitis Media and Otitis Externa The role of parasympathetic innervation in otitis media with effusion and otitis externa (Review)	Am J Clin Ther. The Journal of the American Osteopathic Association 2002 Aug;13(5):457	Full

Box 5 - PEDro Search

Web address: www.pedro.fhs.usyd.edu.au

Clinical question: For Patients with lumbar spine pain (P), is chiropractic (I) or drug therapy (C), more effective in reducing pain (O)?

SEARCH
Advanced search screen



A total of 37 records were found; 2 practice guidelines 30 clinical trials and the following 5 systematic reviews.

Comparison between modalities for specific low back syndromes: characteristics of the literature.	systematic review
The effectiveness of chiropractic for treatment of low back pain: An update and abstract of statistical analysis.	systematic review
A meta-analysis of clinical trials of spinal manipulation.	systematic review
The efficacy of chiropractic manipulation for back pain: A critical review of relevant randomized clinical trials.	systematic review
Spinal manipulation for low back pain.	systematic review

For example, there is also a clinical trial which fits to the Clinical question.

Chiropractic spinal manipulation, a placebo-controlled trial of acupuncture, paracetamol, ibuprofen, anti-inflammatory drugs, and spinal manipulation	items of trial	4/18
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ICL, OSTMED complements PubMed and the Cochrane library by adding materials from other sources specific to its subject focus. Mills, for example, the author who was identified in a PubMed search for the same topic is covered in the meeting abstracts reported in the The Journal of the American Osteopathic Association (JAOA).

Again like ICL, it is not easy to extract evidence from particular studies in the search, but as it is a smaller database the records can be all viewed if you have made the search a specific one. Unlike ICL, OSTMED makes abstracts to the references available as well as the bibliographic information.

- PEDro
(www.pedro.fhs.usyd.edu.au)
The PEDro (Physiotherapy Evidence Database) database is an Australian initiative from the Centre for Evidence-Based Physiotherapy (CEBP) with records back to 1929. Like the Cochrane library, its purpose is to give rapid access to randomised controlled trials, systematic reviews and clinical practice guidelines. Its records have a focus in physiotherapy and some more general manipulative therapy records, so it can be a useful evidence source for chiropractic and osteopathy.

Box 5 (PEDro search) demonstrates another search about manipulative therapy for low back pain. An important strength of the PEDro site is that it identifies clinical

trials, reviews and guidelines so no further search terms need to be used to limit to clinical records. The advanced search follows a guided format which means that “body parts” terms, for example can be searched without needing to identify the relevant headings. Although its major focus is in physiotherapy, the chiropractic manual therapy search identified 37 records that could be reviewed.

Clinical trials are rated with a checklist called the PEDro scale which rates two aspects of trial quality; believability of the trial and whether the trial can be interpreted from the statistical information it provides.

6. Manual Alternative and Natural Therapy Index System (MANTIS)
(<http://www.healthindex.com>)

MANTIS is a subscription database which is available on four different systems; OVID, DIALOG, Datastar and Health Index - the service used in this paper. MANTIS includes citations and abstracts from all alternative medicine disciplines from 1990 onwards. Approximately 70% of the references include abstracts. In addition to the standard MeSH, a supplemental thesaurus with terms specific to CAM therapies has been developed that permits more precise indexing of alternative medical material.

The search example in Box 6 (MANTIS search), uses the advanced search screen. Like PEDro, the advanced search screen enables a guided search which gives more search options on a single screen. For example, the advanced screen allows searching by a specific author, a specific journal, in only one therapy, for high clinical

Box 7 - Database Help File WEb andEmail Addresses

Cochrane Library
Web: <http://www.nicsl.com.au/cochrane/guide.asp>
Email: help@update.co.uk

Medline
Web: http://www.nlm.nih.gov/bsd/pubmed_tutorial/m1001.html
Email: pubmednew@ncbi.nlm.nih.gov

ICL
Web: <http://www.chiroindex.org/resources.htm>
Email: HARVEY_P@palmer.edu

OSTMED
Web: http://ostmed.hsc.unt.edu/ostmed/help_search_tips.htm
Email: ostmed@hsc.unt.edu

PEDro
Web: <http://www.pedro.fhs.usyd.edu.au/tutorial.html>
Email: pedro@fhs.usyd.edu.au

MANTIS
Web: <http://www.healthindex.com/MANTISTutorial1.html>
Email: DClater@HealthIndex.com

relevancy, refereed journals only and the language of the journal. The search described in Box 6, however, did not retrieve different or reduced results when the clinical relevance box was ticked.

A disadvantage of the advanced search screen is that you need to enter all your terms into a single search box if you have chosen more than one search term.


If you email MANTIS they are able to provide a price for a personal or organisational subscription to their database.

Box 6 - MANTIS Discussion

Web address: www.healthindex.com

Clinical question: For Patients with lumbar spine pain (P), is chiropractic (I) or drug therapy (C), more effective in reducing pain (O)?

Advanced search screen



The screenshot shows a search interface with a search box containing 'lumbar spine AND pain'. Below the search box, there are several checkboxes for search filters: 'All', 'Title & Abstract', and 'Fulltext/Keywords'. The search results are displayed in a table below the search box.

Lumbar spine	Total Record Count: 910
Lumbar spine AND pain	Total Record Count: 336
Narrowed to Chiropractic restriction	Total Record Count: 29

Summary

For a practitioner to undertake evidence based practice, there are demands for regular updates of knowledge. Evidence from the literature available on databases is but one part of the whole picture of EBP - a process which overlays clinical expertise on the three considerations of clinical state and circumstances, research evidence, and patient preferences and actions.

The six databases described in this paper are a small, but critical, collection of sources which you can use to search for the evidence needed in your chiropractic or osteopathic practice.

Once you have mastered the basics of searching you can apply your learning to other information sources. In searching and applying findings remember that, as in all professional practices, it takes time and practice to consolidate these skills.

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