Strategies for Searching the Internet for Orthopedic Surgeons: Tips and Tricks

257

Fatih Küçükdurmaz, Terry L. Whipple, Murat Bozkurt, and Daniel G. Kipnis

Contents

F. Küçükdurmaz (✉)
Department of Orthopaedics and Traumatology, Bezmialem Vakif University, Istanbul, Turkey
e-mail: fatihmfk@hotmail.com

T.L. Whipple
American Self, Plastic Surgery and Orthopaedics, PLC, and Orthopaedic Research of Virginia, Richmond, VA, USA
e-mail: whipple@americanself.com

M. Bozkurt
Department of Orthopaedics and Traumatology, Yildirium Beyazit University, Faculty of Medicine, Ankara, Turkey

Department of Orthopedics and Traumatology, Ankara Atatürk Training and Research Hospital, Ankara, Turkey
e-mail: nmbozkurt@yahoo.com; nmbozkurt@gmail.com

D.G. Kipnis
Center for Teaching and Learning and Scott Memorial Library, Thomas Jefferson University, Philadelphia, PA, USA
e-mail: daniel.kipnis@jefferson.edu

M.N. Doral, J. Karlsson (eds.), *Sports Injuries*,
DOI 10.1007/978-3-642-36569-0_248

Abstract

The Internet provides access to large amounts of information quickly, provides a flexible learning platform, and is easily accessible from anywhere, especially with new technologies.

Web-based search engines and bibliographic databases have already become part of a doctor's everyday life.

However, even well-published researchers often fail to appreciate the background knowledge required to conduct a good literature search on the Internet.

Using the right techniques can improve the ability to search for relevant information.

This chapter briefly outlines the Internet as an information resource such as Google, Google Scholar, PubMed, and Cochrane for orthopedic surgeons. Also the subsequent sections of the chapter offers combining search engine tips and tricks for a best search that orthopedic surgeons can use to improve their use of web-based information and learning resources.

Introduction

The impact of the Internet on orthopedics and traumatology has been revolutionary. Compared with traditional education instruments, the Internet offers numerous advantages. It provides access to large amounts of information quickly, provides a flexible learning platform, and is easily accessible from anywhere, especially with new technologies. Furthermore, instruction is enhanced with audiovisual material and easily updated and modified to suit changing learning needs.

Web-based search engines and bibliographic databases, such as Google, Google Scholar, and PubMed, have already become part of a doctor's everyday life. However, many doctors do not know the best ways to maximize their efficacy, and some doctors are still not using them at all. Sinkov et al. reported that a majority of orthopedic surgeons (79 %) use the Internet for at least some of their continuing learning (Sinkov et al. 2004), but the study also reported that attending orthopedic surgeons do not use the Internet as often as orthopedic residents do, suggesting a learning gap.

Surprisingly even well-published researchers often fail to appreciate the background knowledge required to conduct a good literature search on the Internet. Using the right techniques can improve the ability to search for relevant information; without them, however, Internet literature searches can become time consuming and even misleading. A study examined how using PubMed and Google contributed to physicians' diagnostic skill showed that some physicians actually made the correct diagnosis earlier in the investigation and then incorrectly changed their diagnoses after conducting an Internet search about their decision (Falagas et al. 2009) (Fig. 1).

This chapter briefly outlines the Internet as an information resource for orthopedic surgeons and offers some simple techniques that orthopedic surgeons can use to improve their use of web-based information and learning resources.

Databases and Search Engines

Electronic databases provide an index of multiple journals and include citations, abstracts, and sometimes a link to the full text. They are updated with newly published articles. Many are useful in the practice of orthopedic surgery. For instance, they can help surgeons keep track of new findings in the field or search for specific information on specific techniques or outcomes.

The databases can be classified based on their field (medicine, nursing, etc.) and can be searched via specialized search engines (Table 1).

PubMed (National Library of Medicine Database)

The National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) developed PubMed as part of the Entrez retrieval system (National Center for Biotechnology Information). At time of publication, PubMed provides access to approximately 23 million citations. This includes the content in the NLM's database of biomedical journals listed in MEDLINE, life science journals, and relevant online books.

Fig. 1 Reliability of Google is a concern for patients and medical professionals

Table 1 Most commonly used search engines of databases based on their field

Medicine	Pubmed , Embase , Cochrane
Multidisciplinary	Web of science, Scopus
Nursing and allied health	Cinahl
Grey literature	Proquest

Most material includes indexed citations and abstracts, with some full text available. PubMed is updated Tuesday through Saturday and is freely available to anyone with an Internet connection. Academic institutions can link their electronic subscriptions to PubMed offering their users enhanced access to full-text articles.

PubMed provides a free NCBI account, "My NCBI," which allows users to store keyword and MeSH searches. When new results match the keyword and/or MeSH search specifications, users are emailed automatically. Researchers can specify how often they wish to receive search alerts (Fig. 2).

"My NCBI" also allows storing and managing bibliographies, creating customized collections of PubMed citations, activating search filters, creating a CV, and viewing recent searches.

Articles can be searched in two ways: by search terms including words in the title, abstract, authors' names, and institution or by controlled subject headings, known as medical subject headings (MeSH) (U.S. National Library of Medicine 2012). The best searches in PubMed combine both techniques, keywords and MeSH, when building search strategies. For example, researchers can view programmed searches created by RB Haynes in PubMed (Fig. 3). Under PubMed Tools, from the homepage, click on "Clinical Queries" and then click on filter information to view clinical queries using research methodology filters.

Note how the searches combine the use of search tags (i.e., title, abstract) and MeSH terms when available. Using both search techniques results in more comprehensive search results. In addition, the truncation symbol is used. The truncation symbol is used to look for variants of a root word so "random*" will retrieve random, randomizing, randomization, etc.

Another method to search PubMed is to create a set of only orthopedic journals and then combine search terms. From the PubMed homepage, click on "Journals in NCBI Databases" and enter ortho*

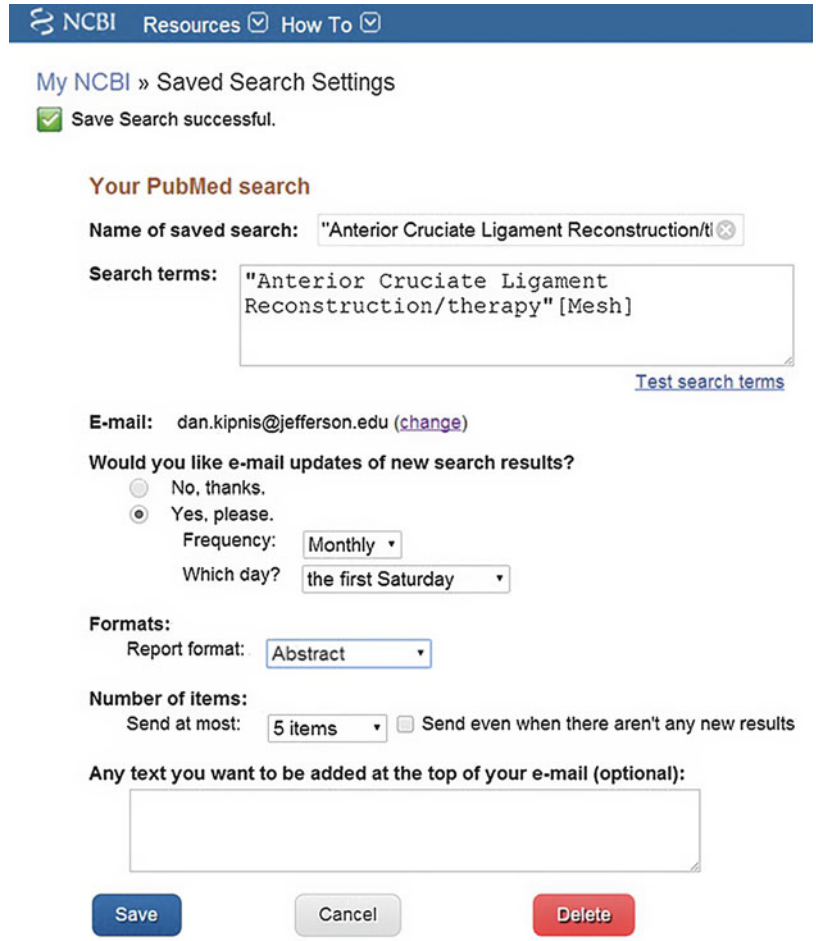


Fig. 2 Saving search strategies in PubMed

to retrieve all journals with variations of orthopedics in the title indexed by PubMed (Fig. 4).

In addition, PubMed also allows search results to be narrowed using several limiters including: article type, text availability, publication dates, journal categories, ages, etc.

EMBASE

Excerpta Medica database (EMBASE) is the electronic database of biomedical journals published by Elsevier. It contains about 25 million records with a coverage of over 7,600 journals from 90 countries from 1974 to the present with Ovid Technologies (2014). Think of EMBASE as the European version of MEDLINE. There is about a 40 % overlap in coverage between EMBASE and MEDLINE (Barratt 2009). EMBASE contains many European publications that are not included in MEDLINE, and it is more comprehensive in the areas of pharmacology, psychiatry, and biomedical engineering. EMBASE features deep drug indexing that allows for unique tracking and precise retrieval of drug adverse events in the published literature.

EMBASE requires a subscription (Elsevier Life Science Solutions). EMBASE pricing is based on the number of biomedical users and currently offers only institutional access. At the time of publication, there is no individual access (Embase FAQs 2014). It should be noted that EMBASE records are indexed in Scopus, although in Scopus you cannot search with EMTREE subject headings, which are the proprietary subject headings used by EMBASE (Fig. 5).

Category	Optimized For	Sensitive/ Specific	PubMed Equivalent
therapy	sensitive/broad	99%/70%	((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials[MeSH Terms] OR clinical trial[Publication Type] OR random*[Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading])
	specific/narrow	93%/97%	(randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract]))
diagnosis	sensitive/broad	98%/74%	(sensitiv*[Title/Abstract] OR sensitivity and specificity[MeSH Terms] OR diagnose[Title/Abstract] OR diagnosed[Title/Abstract] OR diagnoses[Title/Abstract] OR diagnosing[Title/Abstract] OR diagnosis[Title/Abstract] OR diagnostic[Title/Abstract] OR diagnosis[MeSH:noexp] OR diagnostic * [MeSH:noexp] OR diagnosis,differential[MeSH:noexp] OR diagnosis[Subheading:noexp])
	specific/narrow	64%/98%	(specificity[Title/Abstract])
etiology	sensitive/broad	93%/63%	(risk*[Title/Abstract] OR risk*[MeSH:noexp] OR risk *[MeSH:noexp] OR cohort studies[MeSH Terms] OR group[Text Word] OR groups[Text Word] OR grouped [Text Word])
	specific/narrow	51%/95%	((relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word]) OR risks[Text Word] OR cohort studies[MeSH:noexp] OR (cohort[Title/Abstract] AND study[Title/Abstract]) OR (cohort[Title/Abstract] AND studies[Title/Abstract]))

Fig. 3 Clinical queries using research methodology filters built by RB Haynes

Cochrane Library

The Cochrane Library is a collection of six databases that contain different types of high-quality, independent evidence to inform health-care decision making and a seventh database that provides information about groups in The Cochrane Collaboration (The Cochrane Library):

- Cochrane Database of Systematic Review
- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cochrane Methodology Register
- Database of Abstracts of Reviews of Effects (DARE)
- Health Technology Assessment Database
- NHS Economic Evaluation Database
- About The Cochrane Collaboration

As of January Issue 1, 2014, Cochrane Database of Systematic Reviews included around 6,000 reviews and 2,500 protocols.

CENTRAL includes details of published articles taken from bibliographic databases (notably MEDLINE and EMBASE) and other published and unpublished sources. CENTRAL records include the title of the article, information on where it was published (bibliographic details), and a summary of the article, in many cases, but no full-text articles. CENTRAL merges records from MEDLINE and with relevant records from EMBASE (The Cochrane Collaboration).

DARE covers abstracts of reviews in fields of diagnostic tests, public health, health promotion, pharmacology, surgery, psychology, and the organization and delivery of health care. It is a helpful resource for health-care decision makers who are seeking answers to questions about the effects of specific interventions.

As of publication, there are 397 orthopedic and trauma Cochrane groups. For example, one group has reviews on "overuse injuries" and one topic investigates the use of foot orthoses for patellofemoral pain in adults. Each Cochrane

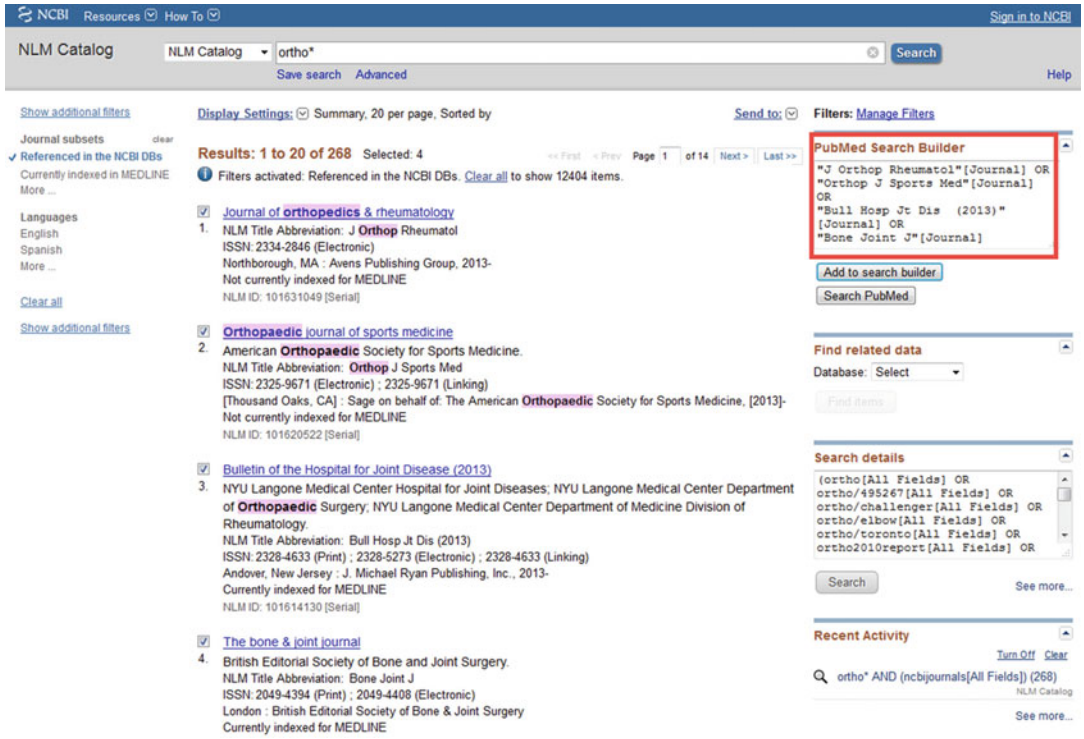


Fig. 4 Creating a search where variations of the word orthopedic appear in the journal title

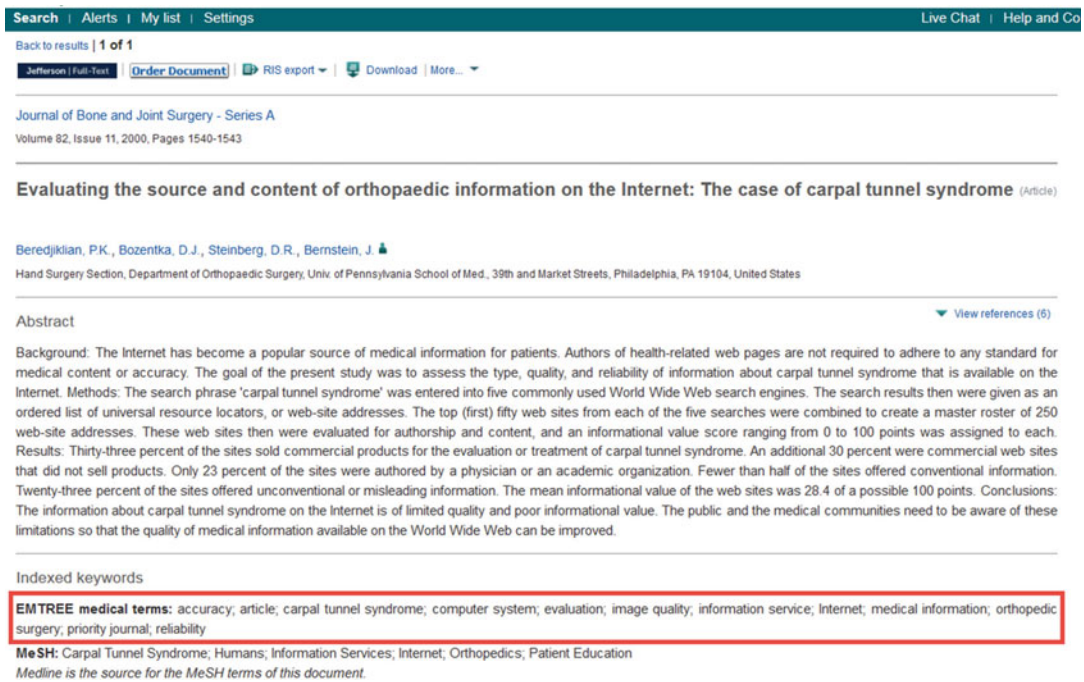


Fig. 5 EMTREE medical terms indexed in Scopus

systematic review is comprehensive. Each review includes background, objectives, methods used, all results, data and analyses, history, declaration of interest, sources of support, and index terms. In vernacular terms, each review will show their work. In addition, each review includes a plain language summary to help answer a clinical question. In summary, researchers should start their research in Cochrane to see if they have examined and answered a clinical question being investigated. It should be noted that Cochrane systematic reviews take time to write and are rare.

CINAHL

Cumulative Index to Nursing and Allied Health Literature (CINAHL) is a research tool for nursing and allied health professionals. It provides full-text access to more than 1,300 journals and indexing for more than 4,000 journals. The database contains more than 1,000,000 records back to 1982. Offering complete coverage of English-language nursing journals and publications from the National League for Nursing and the American Nurses Association, CINAHL covers nursing, biomedicine, health science librarianship, alternative/complementary medicine, consumer health, and 17 allied health disciplines. CINAHL offers access to health-care books, nursing dissertations, selected conference proceedings, standards of practice, educational software, audiovisuals, and book chapters. It also provides additional nursing and allied health research material including health-care books, select conference proceedings, an evidence-based care sheet, and quick lesson disease overviews (EBSCOhost). The index was first published in 1961 and went online in 1984. CINAHL has been published by EBSCO Publishing since 2003 and available exclusively on the EBSCOhost platform since 2006 (Wikipedia).

Web of Science (WoS)

Web of Science (WoS) provides access to three multidisciplinary databases of bibliographic information. It is indexed so that specific articles can be searched by subject, author, journal, and/or author address. Each WoS database includes the article's cited reference list (often called its bibliography). This unique feature allows searching for articles that cite a known author or work (Thomson Reuters).

Scopus

Scopus is an abstract database covering articles from peer-reviewed titles, including international publishers. It is a cross-disciplinary database indexing subjects including chemistry, physics, mathematics and engineering, life and health sciences, social sciences, psychology and economics, biological, agricultural, and environmental sciences, and general sciences (Elsevier Life Science Solutions). It should be noted that MEDLINE citations are indexed in Scopus, so many of the citations that are indexed in PubMed will be indexed in Scopus. So the question becomes why search Scopus if MEDLINE citations found in PubMed are indexed in Scopus?

There are several reasons to search a bibliographic database such as Scopus.

First, it indexes 21,915 journal titles from over 5,000 publishers and over 52 million records. Compared to PubMed, Scopus is larger in scope, with 21,915 versus 5,096 journals (Number of Titles Currently Indexed for Index Medicus® and MEDLINE® on PubMed® 2014). And at time of publication, 23 million citations indexed in PubMed versus 52 million records indexed in Scopus.

Second, Scopus provides cited by analysis to help determine how often works have been cited in the scientific literature. Cited by analysis has its critics, but when pressed for time, cited by analysis helps to filter out which journal articles are being read and cited by other authors (Sarli 2010).

Third, most of the citations from the mid-1990s include complete bibliographies within the record without accessing full text, which allows researchers to work backwards to locate related and relevant research.

Fourth, the ability to search for conference and meeting abstracts and patents as a secondary source.

Google and Google Scholar

Google is the most widely used search engine in the world, and it is often used for health-related information by patients as well as medical professionals. Many studies have assessed the information reliability on Google searches not only in English but also in many other languages (Küçükdurmaz et al. 2013). Almost all of them demonstrated that the quality of information provided by Google was low and that there was no correlation between the search engine rating and the reliability of the provided information. This poses an important problem, especially for patients who may retrieve inaccurate medical information using Google. The low reliability of highly ranked webpages is considered to have a high impact on public health, but it goes beyond the scope of this chapter.

However, Google Scholar, which Google launched in November 2004 to provide a simple way to broadly search for scholarly literature, appears to be a valuable resource. In particular, studies have demonstrated that Google Scholar has value for initial literature searches, although for more comprehensive searches, bibliographic databases are more effective (Dapra 2012).

Google Scholar indexes the following:

- Scholarly journal articles
- Article preprints, postprints
- Working papers
- Dissertations
- Theses
- Technical Reports
- Scholarly books
- Abstract collections
- US legal opinions

Google Scholar does not index:

- News articles
- Magazine articles
- Press releases and announcements
- Images
- Editorials
- Book reviews
- Trip reports

Shariff et al. compared PubMed with Google Scholar and found that Google Scholar retrieved twice as many relevant articles (PubMed: 11 %; Google Scholar: 22 %; $P < 0.001$) and with a similar precision. According to the study, Google Scholar also provided significantly greater access to free full-text publications (PubMed: 5 %; Google Scholar: 14 %; $P < 0.001$) (Shariff et al. 2013). Furthermore, Nourbakhsh et al. found that PubMed searches and Google Scholar searches often identify different articles. In their study, Google Scholar articles were more likely to be classified as relevant, had higher numbers of citations, and were published in higher impact factor journals (Nourbakhsh et al. 2012).

Search techniques can be combined for specific searches. For example, in Google:

("anterior cruciate ligament reconstruction" OR "ACL reconstruction") site:edu filetype:ppt

It will retrieve web results that mention "ACL reconstruction" from education domains and are PowerPoint slides.

To further reduce search results, researchers can add intitle: prior to keywords to search for terms in the title of the web page.

(intitle:"anterior cruciate ligament reconstruction" OR intitle:"ACL reconstruction") site:edu filetype:ppt

Another technique is adjacency, where search terms can be searched near each other.

("anterior cruciate ligament AROUND(4) reconstruction" OR "ACL AROUND(4) reconstruction") site:edu filetype:ppt

This search strategy will look for the terms "ACL" and "reconstruction" within four words or less of each other.

Gray Literature and Its Impact on Evidence

Gray literature is defined as the literature produced by government, academics, business, and industry that is available in print and electronic formats but that is not controlled by commercial publishers (Grey Literature 1999). Examples of

gray literature would include white papers, preprints, technical reports, etc. In short, gray literature is defined as literature that is not formally published in sources such as books or journal articles (Higgins and Green 2008).

Evidence suggests that gray literature may differ in important ways from the more easily retrieved studies (Conn et al. 2003). Well-documented differences have fueled a debate about whether gray literature should be included in literature searches or not (Conn et al. 2003). For example, conference abstracts and other gray literature have been shown to be sources of approximately 10 % of the studies referenced in Cochrane reviews (Mallett et al. 2002).

The most noteworthy difference between published and unpublished research is that published research is more likely to report findings that are statistically significant, commonly referred to as bias against the null hypothesis (Easterbrook et al. 1991; Dickersin et al. 1992; Rosenbaum et al. 1995). Research reports with statistically significant findings are more likely to be published in English and in widely distributed journals that are indexed in computerized databases and have high citation impact factors (Begg and Berlin 1989).

Conn et al. found that the meta-analyses that exclude gray literature likely (a) overrepresent studies with statistically significant findings, (b) inflate effect-size estimates, and (c) provide less precise effect-size estimates than meta-analyses including gray literature (Conn et al. 2003). In this sense, Dickersin et al. found that failure to include unpublished studies compromises the validity and reliability of meta-analysis when unpublished findings differ in some systematic way from published findings (Dickersin et al. 1992).

Combining Search Engines

Some databases, such as PubMed and EMBASE, are more likely to contain literature that is relevant to the practice of orthopedic surgery. Furthermore, differences in programming and algorithms between search engines often results in the delivery of different results in response to the same keyword search. For the most complete results, searching at least two databases is recommended when performing a comprehensive review of the literature.

Table 2 Limitations of databases

Search results from bibliographic databases depend on the search strategy used
Obtaining a comprehensive selection of references can involve searching several databases because their coverage varies
Not surprisingly, the results of our study suggest limitations of MEDLINE and EMBASE in locating relevant conference and journal supplement abstracts
Most databases only include published articles; it is necessary to search separately for gray literature

The combined use of PubMed, EMBASE, and Cochrane identifies a very high percentage of primary research included in orthopedic surgery meta-analyses. There are certain limitations of databases (Table 2), but Slobogean et al. found that a combined search of MEDLINE and EMBASE retrieved 91 % of the primary studies. The addition of Cochrane improved retrieval to 97 %. The additional use of the Cochrane databases is important because it increases the search yield of conference proceedings and abstracts.

Additional searches of databases such as WoS, Scopus, and CINAHL did not increase the recall rate; however, conference proceedings and journal supplements should still be searched to ensure that relevant remaining reports are identified (Slobogean et al. 2009).

A tip when searching Google: Google search results are different based on where the searches are conducted. So a search you run in your office will differ from a search you run at work, unless of course you work from home. Google attempts to automatically detect a user's location and provide customized results. Results are based on IP address. Obviously, this become important when searching for local dining establishments, but your results will change if you search US Google versus UK Google (www.google.co.uk) versus Google Turkey (www.google.tr) To improve results, try changing your location setting and turn off search history personalization. Also, keep a record of your search strategy including time, date, and relevant search results found, since recreating the search is not consistent.

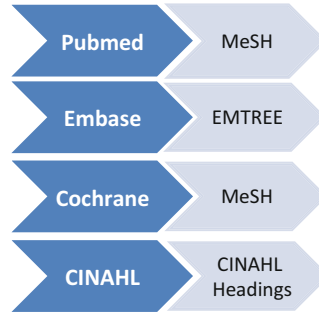
Tips and Tricks for a Best Search in a Bibliographic Database

A reproducible, efficient, time-saving search is not a talent but rather a learnable skill. And if time is not a luxury, make sure to seek out a librarian who can help to find relevant terminology, help structure a search strategy, recommend databases, and manage bibliographic citations (Sollenberger and Holloway 2013). The key to successful and time-efficient information identification is to use easily accessible, complete, and up-to-date information. The search should aim to exclude the irrelevant evidence while catching the necessary evidence.

Basic suggestions for a literature search:

1. Define the scope the search.
   (a) Design the question. Use PICO (T) template to help structure your question (Riva et al. 2012).
   (b) Select valid inclusion and exclusion criteria.
2. Choose the right search engines or bibliographic database(s) for the type of evidence you want to retrieve.
3. Choose the right search terms. This is particularly important. Using medical subject heading (MeSH) terms helps retrieve more accurate results and is particularly useful if different terminology was used for the same concepts. MeSH uses a hierarchical terminology categorization system (Table 3) that is based on subject analysis of biomedical literature at NLM. This feature can be accessed via PubMed main webpage (Fig. 6). Multiple terms can be added (AND), excluded (NOT), or searched together (OR) at the same time with using search

Table 3 Hierarchical terminology categories in different search engines



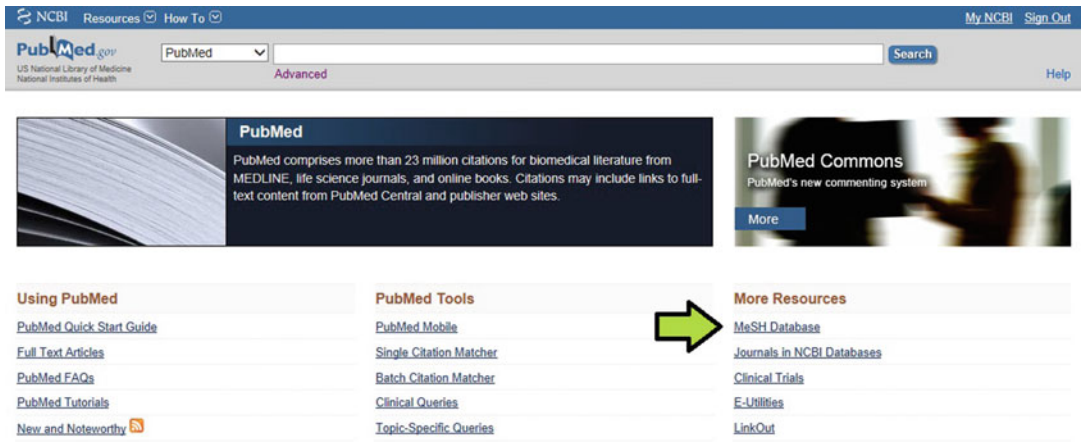


Fig. 6 MeSH can be accessed from the main page of PubMed

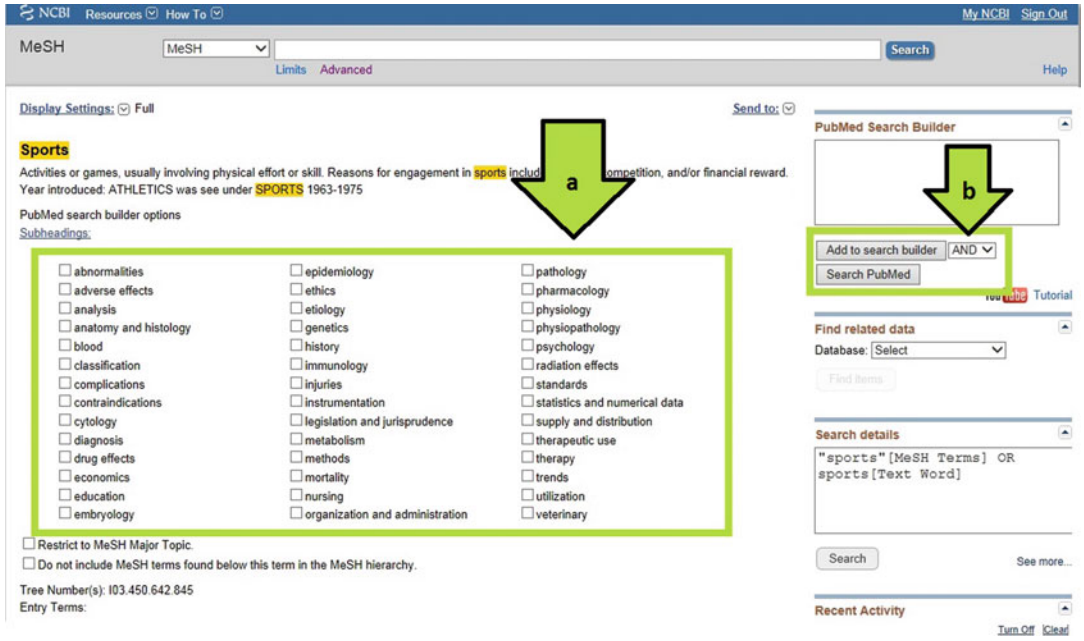


Fig. 7 MeSH database allows to specify your search subtopic (**a**) and to build a search with using Boolean operators at the same time (**b**)

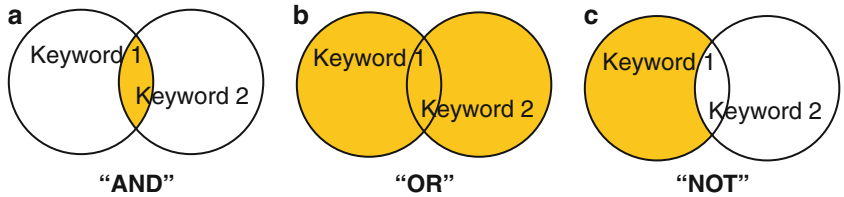


Fig. 8 "Keyword 1" AND "Keyword 2" : include "Keyword 1" and "Keyword 2" together (**a**) "Keyword 1" OR "Keyword 2": include either "Keyword 1" or "Keyword 2" (**b**), "Keyword 1" NOT "Keyword 2" : include "Keyword 1" exclude "Keyword 2" (**c**)

builder function for a specific field in a particular topic (Fig. 7a, b).

4. Use Boolean logic to include, exclude, or combine the keywords and queries (Fig. 8a–c).
5. Use truncation when searching keywords to look for variations of the root word.
6. Almost all search engines of bibliographic databases have an "advanced search" option. This offers many ways to prefilter the search queries (Fig. 9a, b). A search can include the name of an author, journal, publishing date, and language MeSH terms (see below), among many other options. Also the advanced search makes it possible to combine more than one search. These searches can then be merged or excluded after making them separately by using Boolean logic (Fig. 10).

These brief but basic principles are valid for every search engine or bibliographic

Fig. 9 The advanced search buttons are seen for Cochrane (**a**) and PubMed (**b**). It is possible to build a search with using functions appeared under drop-down menus

database. For additional information on searching techniques, all search engines have links to tutorials explaining the most effective way to carry out a search using that particular search engine. Use of these free tutorials is strongly suggested prior to use. Other guides can be found online at YouTube. And do not forget to consult with a librarian.

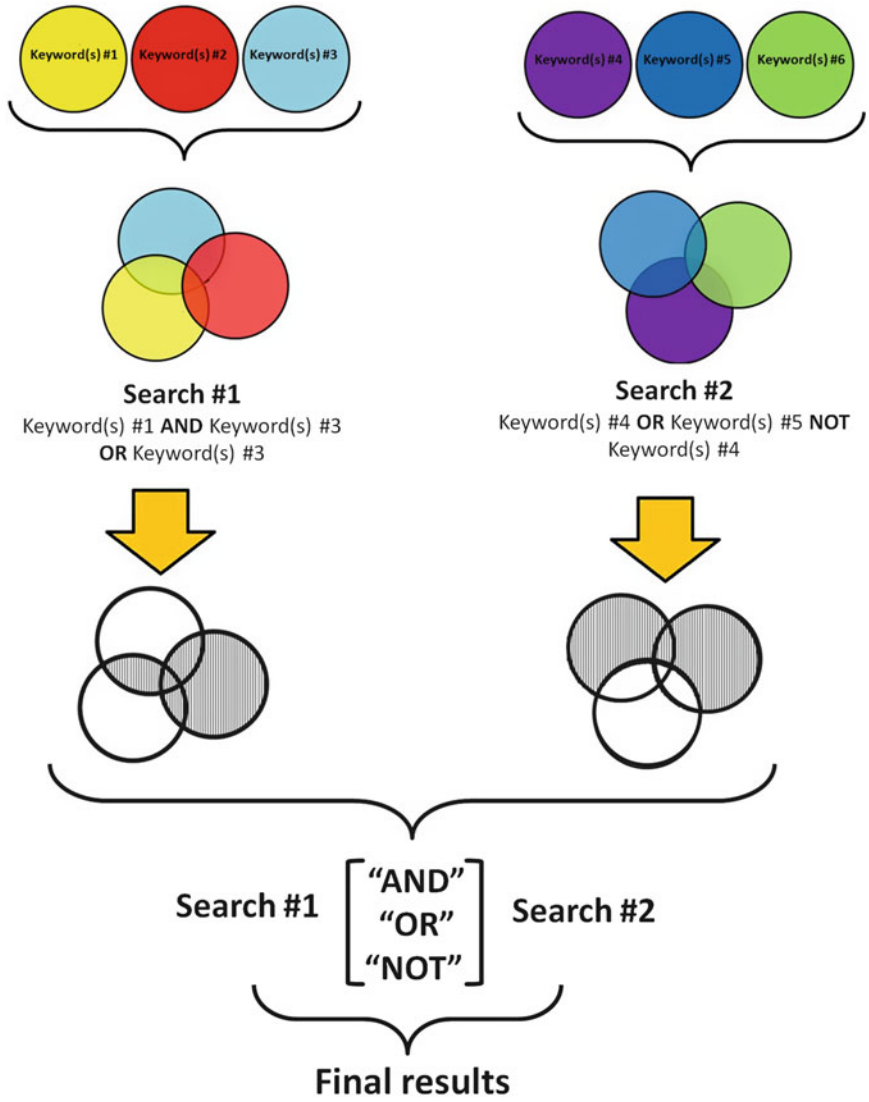


Fig. 10 Different search results can be composed to yield the final results

Conclusion

In summary, researchers should be trained in running efficient and effective search strategies since databases and search engines all have unique features. In order to make a comprehensive search, it is recommended that searching multiple bibliographic databases and search engines is optimal for finding relevant citations. There will be overlap in results, but it behooves researchers to search multiple resources to be sure that the best available research is used to answer clinical questions.

References

Barratt H (2009) Electronic bibliographical databases and their limitations HealthKnowledge http://www.healthknowledge.org.uk/public-health-textbook/research-methods/1a-epidemiology/electronic-bibliographies

Begg CB, Berlin JA (1989) Publication bias and dissemination of clinical research. J Natl Cancer Inst 81:107–115. doi:10.1093/jnci/81.2.107

Conn VS, Valentine JC, Cooper HM, Rantz MJ (2003) Grey literature in meta-analyses. Nurs Res 52 (4):256–261

Dapra D (2012) Indexing repository content in Google Scholar. Digit Commons http://digitalcommons.bepress.com/webinars/24/

Dickersin K, Min YI, Meinert CL (1992) Factors influencing publication of research results. Follow-up of applications submitted to two institutional review boards. JAMA J Am Med Assoc 267:374–378. doi:10.1001/jama.267.3.374

Easterbrook PJ, Berlin JA, Gopalan R, Matthews DR (1991) Publication bias in clinical research. Lancet 337:867–876. doi:10.1016/0140-6736(91)90201-Y

EBSCOhost. CINAHL Complete. http://www.ebscohost.com/nursing/products/cinahl-databases/cinahl-complete

Elsevier Life Science Solutions. EMBASE. http://www.elsevier.com/online-tools/embase

Elsevier Life Science Solutions. Scopus. http://www.elsevier.com/online-tools/scopus

Embase FAQs (2014). http://www.elsevier.com/online-tools/embase/training-and-support

Falagas ME, Ntziora F, Makris GC, Malietzis GA, Rafailidis PI (2009) Do PubMed and Google searches help medical students and young doctors reach the correct diagnosis? A pilot study. Eur J Intern Med 20(8):788–790. doi:10.1016/j.ejim.2009.07.014, Elsevier B.V

Grey Literature (1999) In: The fourth international conference on grey literature, Washington, DC

Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from http://www.cochrane-handbook.org

Küçükdurmaz F, Aytekin MN, Tuncay I, Şen C (2013) A pilot study about quality of knowledge in Turkish web sites on health: meniscus tear. Nobel Med 9(2):114–117

Mallett S, Hopewell S, Clarke M (2002) Grey literature in systematic reviews: the first 1000 Cochrane systematic reviews. Fourth symposium on systematic reviews: pushing the boundaries. Oxford, UK

National Center for Biotechnology Information. National Library of Medicine. http://www.nlm.nih.gov/services/pubmed.html

Nourbakhsh E, Nugent R, Wang H, Cevik C, Nugent K (2012) Medical literature searches: a comparison of PubMed and Google Scholar. Health Inf Libr J 29:214–222. doi:10.1111/j.1471-1842.2012.00992.x

Number of Titles Currently Indexed for Index Medicus® and MEDLINE® on PubMed® (2014). http://www.nlm.nih.gov/bsd/num_titles.html

Ovid Technologies (2014) "Embase" http://www.ovid.com/site/catalog/databases/903.jsp

Riva JJ, Malik KMP, Burnie SJ, Endicott AR, Busse JW (2012) What is your research question? An introduction to the PICOT format for clinicians. J Can Chiropr Assoc 56(3):167–172

Rosenbaum WL, Sterling TD, Weinkam JJ (1995) Correcting standardized rate ratios for imprecise classification of a polychotomous exposure variable with limited data. Am J Epidemiol 142:442–445

Sarli CC (2010) Beyond citation analysis: a model for assessment of research impact. J Med Libr Assoc 98(1):17–23

Shariff SZ, Bejaimal SAD, Sontrop JM, Iansavichus AV, Haynes RB, Weir MA, Garg AX (2013) Retrieving clinical evidence: a comparison of PubMed and Google Scholar for quick clinical searches. J Med Internet Res 15:e164. doi:10.2196/jmir.2624

Sinkov VA, Andres BM, Wheeless CR, Frassica FJ (2004) Internet-based learning. Clin Orthop Relat Res 421 (421):99–106. doi:10.1097/01.blo.0000126944.23557.5c

Slobogean GP, Verma A, Giustini D, Slobogean BL, Mulpuri K (2009) MEDLINE, EMBASE, and Cochrane index most primary studies but not abstracts included in orthopedic meta-analyses. J Clin Epidemiol 62 (12):1261–1267. doi:10.1016/j.jclinepi.2009.01.013, Elsevier

Sollenberger JF, Holloway RG (2013) The evolving role and value of libraries and librarians in health care. JAMA J Am Med Assoc 310(12):1231–1232. doi:10.1001/jama.2013.277050

Thomson Reuters. Web of Science. http://thomsonreuters.com/thomson-reuters-web-of-science/

U.S. National Library of Medicine (2012) Branching out: the MeSH® Vocabulary (viedo) http://www.nlm.nih.gov/bsd/disted/video/

Wikipedia. CINAHL. http://en.wikipedia.org/wiki/CINAHL