

Searching Skills Toolkit

FINDING THE EVIDENCE

SECOND EDITION

by Caroline De Brún and Nicola Pearce-Smith

Edited by Carl Heneghan, Rafael Perera and Douglas Badenoch



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Table of Contents

[Dedication](#)

[Title page](#)

[Copyright page](#)

[CHAPTER 1: Introduction](#)

[Evidence-based medicine](#)

[Why search?](#)

[How do you keep up to date](#)

[CHAPTER 2: Where to start](#)

[The hierarchy of evidence](#)

[The hierarchy of searching](#)

[1. How much time do I have?](#)

[2. What type of publication am I looking for?](#)

[3. Is my query about a specific topic?](#)

[CHAPTER 3: Clinical information: sources](#)

[Medical libraries](#)

[The Internet](#)

[CHAPTER 4: Searching the Internet](#)

[Search engines and directories](#)

[Evaluating material found on the World Wide Web](#)

[Saving useful websites](#)

CHAPTER 5: Formulating searchable questions

Types of question

Breaking down the clinical scenario

Identifying keywords

CHAPTER 6: Building a search strategy

Identifying synonyms

Synonym sources

Truncation and wildcards

Combining terms (using Boolean operators)

Construction of the final search strategy

Refining search strategies (also known as limiting)

CHAPTER 7: Free text and thesaurus searching

Free text searching

Thesaurus searching

CHAPTER 8: Searching healthcare databases

Finding the evidence: key steps

Medline

PubMed

Ovid Medline

CINAHL

Cochrane Library

CHAPTER 9: Refining search results

Limits

Methodological filters

Clinical Queries

Sensitivity versus specificity

Systematic reviews

CHAPTER 10: Saving citations

Logbooks

Reference management software

CHAPTER 11: Citation pearl searching

Related items

Author search

Keywords

Journals

Snowballing

Alerts

RSS feeds

CHAPTER 12: Quality improvement and value: sources

Examples of quality improvement and value questions

Current awareness

Searching for evidence on quality improvement and value

Other useful sources of information

Networks

CHAPTER 13: Patient information: sources

Shared decision-making

Poor quality health information

Good quality health information

Appraising online consumer health information

Trusted information sources

Rarer conditions

Third-party assistance

Patient decision aids

Writing patient information

Keeping up to date with patient information

CHAPTER 14: Critical appraisal

Definition

Critical appraisal checklists

CHAPTER 15: Glossary of terms

APPENDIX 1: Ten tips for effective searching

APPENDIX 2: Teaching resources

Record your favourite resources

Index

Without the belief of my family and, in particular, my husband, none of this would have been possible.

Caroline De Brún (née Papi).

Searching Skills Toolkit

Finding the Evidence

Second Edition

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CHAPTER 1

Introduction

This new edition of the *Searching Skills Toolkit* contains updated instructions and examples for searching a range of healthcare databases, highlighting new features which have evolved as a consequence of technological advances. The sections within some chapters have been reorganised in order to emphasise the steps of the search process and the hierarchy of evidence. There were many web sources included in the first edition, and these have been updated and added to. The chapter on reference management software now includes open source software, such as Mendeley and Zotero, and Appendix 2 on teaching resources contains a new training exercise, for trainers to use in their search skills sessions.

The details in this toolkit are correct at the time of going to press, but please be aware that the Internet is constantly evolving, and the features and appearance of some resources may change slightly as technology progresses. However, the principles and resources underpinning this toolkit are transferable and adaptable to any changes that might arise.

Additionally, this edition contains two new chapters. The first – [Chapter 12](#): Quality improvement and value: sources – focuses on sources of information for health management, quality improvement and cost-effectiveness, to support evidence-based (EB) management decision-making. This chapter is particularly aimed at commissioners, policymakers and health managers. The second new chapter – [Chapter 13](#): Patient information: sources – has

been written to help health professionals find good quality health information for patients and their carers. Involvement in the treatment decision-making process is beneficial to the patient and the health service, and is high on government agendas, so it is important that patients have the right information to help them make informed choices that suit them.



Evidence-based medicine

The concept 'evidence-based medicine' was first used by David Sackett and colleagues at McMaster in Ontario, Canada in the early 1990s. It means

*"... the integration of best research evidence with clinical expertise and patient values."*¹

Thus the aim of evidence-based practice (EBP) is to improve the quality of information on which decisions are made.

EBP provides resources to help health professionals find the best quality information to answer their clinical questions. Without these resources, health professionals become overloaded with information, and don't have the time to appraise all the current material published.

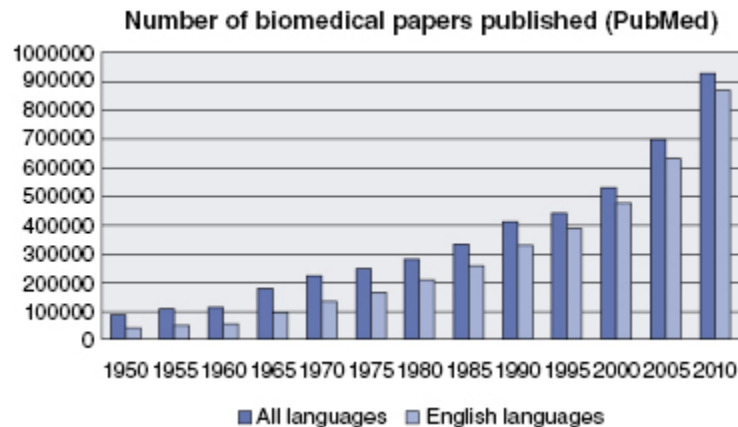
In 1972, Archie Cochrane, a British epidemiologist, became concerned that most decisions about interventions were based on an unstructured selection of information, of varying quality.

When making choices at home, such as what car to buy, we usually do some background research, for example, ask friends, look at car magazines, television programmes about cars, etc. We don't have all the answers, not as professionals and not as human beings. We may have gut instincts to guide us, and these can be useful. But you cannot base your choice on gut instinct. Intuition based on professional expertise is part of the evidence-based practice concept, and can be applied to patient care, as long as it is supported by the best available research evidence.

Why search?

Searching skills are a necessity for all health professionals who want to stay up to date with best practice, particularly with the vast increase in research publication and the improved access to research via open access journals. Health professionals need to know how to find and appraise all this research. In 1865, the US National Library of Medicine began indexing medical literature, starting with 1600 references, and reaching 10 million by 2006.² In 1999 there was an estimated 32 000 medical journals around the world;³ the medical literature expands at a rate of 7% per year, doubling approximately every 10–15 years.⁴ Currently 400 000 articles are added to the biomedical literature each year.⁵

Figure 1.1 Of note, 50 years ago, a greater proportion of the research was published in languages other than English. At the present time, almost 90% of articles are published in English. Data from PubMed, figure created by authors.



Open access resources, such as Biomed Central (www.biomedcentral.com), provide access to 256 peer-reviewed journals covering a range of health-related specialities.

Reading and reviewing all the literature is not feasible for anyone, let alone busy health professionals. There are a range of resources available to help health professionals find the relevant information they require, but some sources contain better quality information and should be targeted first.

Evidence-based practice requires time and a resource investment, as there is so much research to read to inform practice. The aim of this *Searching Skills Toolkit* is to provide you with tools to find the best available evidence faster and more efficiently.

The toolkit has been divided up into chapters covering the basic skills and information you need to know to be an effective searcher. You may wish to work through the chapters in order, but for a quick overview we recommend starting with [Chapter 2](#). This chapter outlines where to go to conduct a health information search depending on how much time you have, what type of publication you require or the specific topic area. A flow chart is included that directs you to search the higher quality evidence first. Where appropriate, references are given pointing you to the

essential chapters you need to read, when you see this symbol:



Chapter 9: Refining search results

How do you keep up to date

You can meet your current information needs by a variety of strategies:

- Toss a coin! – May be useful if there are only two options and you already know both.
- Guess – fine if you have the confidence, but what if you're asked to justify your decision?
- 'Do no harm' – don't try anything dangerously innovative!
- Training – remember what you learned during your professional training, which was considered optimum treatment 10 years ago.
- Ask colleagues – but if you ask three people, you may well get three opinions, so who is correct?
- Textbooks – how old are your textbooks and how decayed was the material in them when you bought them?
- Browse journals ... getting better, but which ones do you choose?
- Literature searching – do you have access to, and the skills to search, bibliographic databases?

Apparently doctors use some 2 million pieces of information to manage patients⁶. Textbooks, journals and other existing information tools are not adequate for answering the questions that arise: textbooks are out of date, and 'the signal-to-noise' ratio of journals is too low for them to be useful in daily practice. When you see a patient, you usually generate at least one question; more questions

arise than a doctor seems to recognise. Most questions concern treatment, some are highly complex. Many questions go unanswered, the main reason being lack of time. Some doctors rarely consider the merits of doing a formal electronic search (or of asking a librarian to do a search for them!).

- Write down one healthcare-related problem you recently encountered.
- What was the critical question?
- Did you answer it? If so, how?

Reflect on how you learn and keep up to date. How much time do you spend on each process? Activities usually identified include: attending lectures, conferences or tutorials, reading journals, textbooks or guidelines, clinical practice, small group learning, study groups, searching electronic resources, and speaking to colleagues and specialists. There is no right or wrong way to learn, but it is impossible to keep up to date with all the latest advances. One way to overcome the information overload is to use a push and pull strategy.



The 'push' method is the information we gather from the variety of sources that we receive across a wide spectrum of topics. This could be lectures, seminars, reading journals or magazines. To improve on this technique you should consider reading some pre-appraised source material. An example is the *EBM journal* or *Clinical Evidence*; this will cut down the time you spend reading.



The second method is the 'pull' technique, whereby you keep a record of the questions you formulate using the PICO principle (described in [Chapter 5](#)) and then 'pull' information as you need it. *Clinical Evidence* can be used for this sort of information gathering, but the use of a formal literature search would be more useful in obtaining an answer.

Notes

1 Sackett, D.L., Strauss, S.E., Richardson, W.S., Rosengerg, W. & Haynes, R.B. 2000. *Evidence-based Medicine: How to Practice and Teach EBM*, Churchill Livingstone, Edinburgh.

2 Bastian, H., Glasziou, P. & Chalmers, I. 2010. Seventy-Five Trials and Eleven Systematic Reviews a Day: How Will We Ever Keep Up? *PLoS Medicine*, 7(9), e1000326. doi:10.1371/journal.pmed.1000326.

3 Library and Information Statistics Unit. 1999 *Library and Information Statistics Tables, 1998*, University of Loughborough, Loughborough.

4 Price, D.S. 1981. The development and structure of the biomedical literature. In Warren, K.S. Ed. *Coping with the Biomedical Literature: a Primer for the Scientist and Clinicians*. Praeger, Westport, CT, USA.

5 Davis, D.A., Ciurea, I., Flanagan, T.M. & Perrier, L. 2004. Solving the information overload problem: a letter from Canada. *Medical Journal of Australia*, 180(6 Suppl), S68-S71.

6 Smith, R. 1996. What clinical information do doctors need? *BMJ*, 313, 1062.

Further reading

Akobeng, A.K. 2005. Principles of evidence based medicine. *Arch Dis Child*, 90(8), 837-840 available from: PM:16040884

✓

Full

text:

www.adc.bmj.com/content/90/8/837.full.pdf+html

Dawes, M., Summerskill, W., Glasziou, P., Cartabellotta, A., Martin, J., Hopayian, K., Porzsolt, F., Burls, A. & Osborne, J. 2005. Sicily statement on evidence-based practice. *BMC Med Educ*, 5(1), 1 available from: PM:15634359

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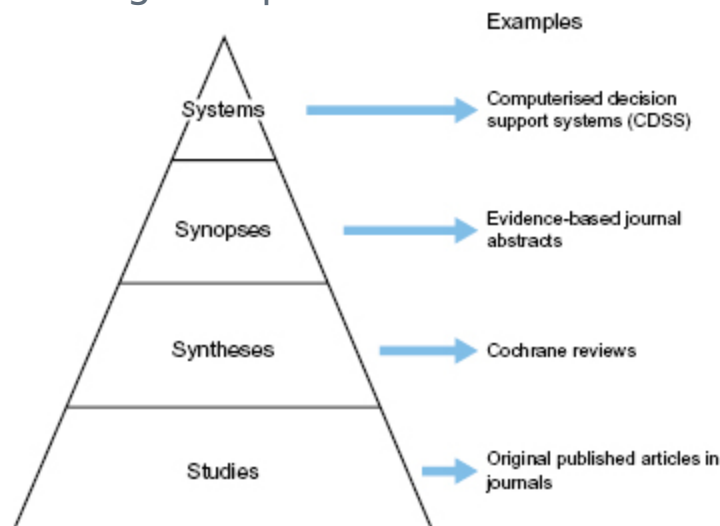
CHAPTER 2

Where to start

The hierarchy of evidence

Not all evidence is equal. One way of making sure you find the best quality evidence is to use a 'hierarchy', such as the 4S structure shown in [Figure 2.1](#).

Figure 2.1 The 4S Levels of organisation of evidence from research. Reproduced from Haynes RB,⁷ with permission from BMJ Publishing Group Ltd.



Computerised support systems (that integrate and summarise relevant evidence about a patient problem) are developing, and may be more widely available in the future. However, realistically a user will need to look for evidence in the following order:

- Synopses – journals containing summaries of evidence with associated commentaries such as *Evidence-Based*

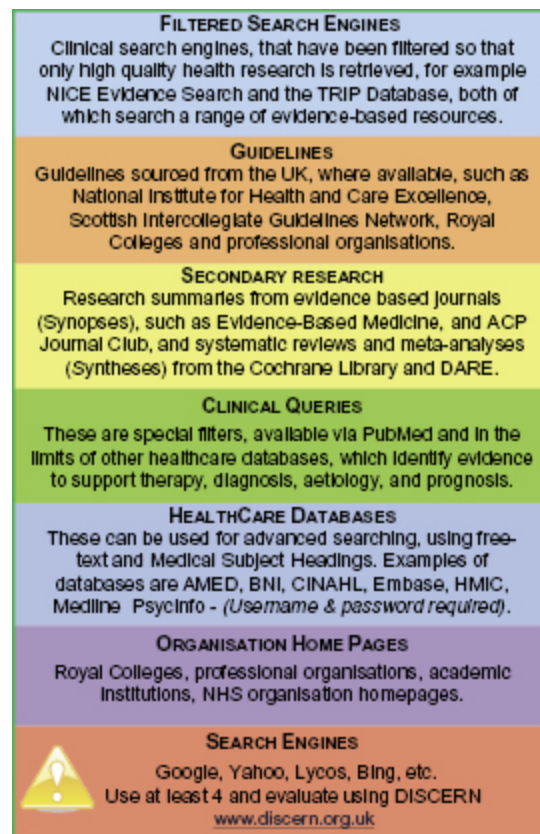
Medicine, ACP Journal Club, Clinical Evidence.

- Syntheses – systematic reviews from the Cochrane Collaboration and the Database of Abstracts of Reviews of Effectiveness (DARE).
- Studies – primary research from journals (randomised controlled trials, cohort studies, case control etc.).

The hierarchy of searching

Use this next chart to help you decide where to start searching. Move through the levels until you have found the evidence you need.

Remember that the quality of evidence is lower the further down the chart you go.



Ask yourself: