

Evidence-based Dentistry: Part 2. Finding the Research

CDA's Resource Centre offers a full range of services to meet members' clinical, practice management and oral health research needs. This article is part of an occasional series to help better inform readers on topics of interest by providing answers to actual questions posed to the Resource Centre. If you have a topic you would like the CDA Resource Centre to address, email your question to library@cda-adc.ca.

In the last installment of “You Ask, We Answer,” we provided a brief overview of evidence-based dentistry (EBD).¹ This month we will focus on ways to formulate a search question, various search tips and other EBD resources.

How to formulate a searchable question

The first step in practising EBD is to recognize a need for information. The second step is to formulate your question, which is sometimes easier said than done. However, good literature searches start with good questions. A carefully thought-out clinical question will ensure that all elements of your case are covered and broken down into important concepts, which makes your search for evidence easier. A helpful search method is the PICO model. Each letter of PICO corresponds to an element of your clinical question (**Box 1**).

Search tips

Most online databases employ universal search basics. The following tips can be used no matter which database you are using.

Controlled vocabulary

If you are using MEDLINE or PubMed to search for clinical scientific information, it is useful to familiarize yourself with their terminology. In MEDLINE and PubMed, all articles are tagged with subject headings. Knowing these subject headings will help you retrieve relevant search results.

The National Library of Medicine uses a controlled vocabulary to index articles, called MeSH (Medical Subject Headings). For example, “oral cancer” is indexed as “Mouth Neoplasms.” Using the term

“Mouth Neoplasms” will retrieve more relevant results than using “oral cancer.” There is no need to memorize all the terms, as most databases have a thesaurus or a search feature that will automatically direct you to the subject heading if you enter a common term. PubMed offers free online tutorials about MeSH. See www.PubMed.gov, under the heading “PubMed Services” (on the left-hand side of the screen), select “MeSH Database.”

Boolean logic

Once you have established your terms, how you combine them is important. MEDLINE and PubMed employ Boolean logic. This is a search technique that allows you to combine search terms using AND, OR and NOT. The structure of your PICO question will determine whether you use AND or OR. When using AND, you are narrowing down your search to articles that include both search terms (for example, you AND me). When using OR, your search is broadened and will include one or the other search term (for example, you OR me).

Sometimes, despite your best efforts, you'll get negative hits. Negative hits are articles that have nothing to do with your question, but still appear in your results. Before using NOT to eliminate those results, carefully review your search string and the results. Will you eliminate any relevant articles if you employ NOT? Sometimes it is better to put up with the negative hits rather than lose relevant articles.

Other characters and tricks of the trade

- Bring order to your search by using **parenthesis** to **nest your concepts**.

Box 1 PICO search model

Each letter of PICO corresponds to an element or category of your clinical question.

P – Patient, problem and/or population

Example case: **Patient:** male, 50 years old, smoker, overweight.

Problem: Patient has exhibited symptoms of obstructive sleep apnea.

- Describe the characteristics of the patient or population.
- What is the condition or disease? Be as descriptive as possible. Think of how you would describe the patient, problem or population to a colleague.

I – Intervention

Intervention: Prescribe an oral appliance.

- What is your proposed course of treatment? What would you like to do with this patient?
- How would you like to treat the patient? With medication, surgery, observation, provide a diagnosis, etc.?

C – Comparison (optional)

Alternative treatment: Continuous positive airway pressure (CPAP) device.

- Is there an alternative to your proposed intervention?
- Would you like to compare one treatment to another?
- This element allows you to explore the alternative methods of treatment for your particular problem. This part of PICO is optional and might not be required for your patient, problem or population.

O – Outcome

Outcome: Provide relief for obstructive sleep apnea.

- What are the relevant outcomes?
- What do you hope to accomplish, improve or affect?
- An outcome could be to eliminate or relieve specific symptoms, improve function or enhance esthetics.

Possible EBD question: For a 50-year-old male who smokes and is overweight, how effective is an oral appliance compared to a CPAP device in relieving symptoms of obstructive sleep apnea?

Key terms: obstructive sleep apnea, oral appliances, CPAP device

For example, (infection control OR sterilization OR asepsis) AND (dental office OR dental clinics).

- Use an **asterisk (*)** to **truncate a word** (e.g., ident* = identification, identify, identity).
- Use a **question mark (?)** to **search for spelling variations** (e.g., wom?n, for singular and plural, or p?ediatric for the British/Canadian or American spelling).
- Use **quotation marks** to **capture a phrase** (e.g., “burning mouth syndrome”). This will force the search engine to look for words in a phrase together and in that order.

Gathering the evidence

Clinical articles are available through a few different sources. You can order articles through the journal’s publisher, although this can be costly. If an article is from an open access journal, you can get it for free from the journal’s website. In addition, CDA members can request articles through the CDA Resource Centre for a nominal fee of \$9 per article.

How to evaluate the evidence

Once you’ve completed your search and retrieved your articles, your next step is to critically appraise the evidence you have gathered. Essentially, you want to ask questions to test the reliability, validity, results and relevance of the study.

Within each article, **examine the basics:** the aim of the study, the sample size, the outcome assessment and the statistics. Are there any gaps in the research? Any biases, chance outcomes, confounding outside influences on the trial groups and flawed interpretations are all red flags about the reliability and validity of the study. You can then check for any other studies that can back up these claims.

The Centre for Evidence-based Medicine provides free worksheets to help critically appraise systematic reviews, diagnostic studies and randomized control trials. See www.cebm.net, under the heading “EBM Tools,” and select “Critical Appraisal.”

Bottom line: Do not assume that because a study is based on a randomised control trial or features a systematic review that quality evidence is being presented — a critical appraisal of the evidence is essential when practising EBD.

Resources on CDA's Members' Website

Journal of the Canadian Dental Association (JCDA) Series on EBD (2000–2001):

The Building Blocks of Evidence-based Dentistry
by Susan E. Sutherland

- Part I. Getting Started
- Part II. Searching for Answers to Clinical Questions: How to Use MEDLINE
- Part III. Searching for Answers to Clinical Questions: Finding E-evidence on the Internet (by Susan E. Sutherland and Stephanie Walker)
- Part IV. Research Design and Levels of Evidence
- Part V. Critical Appraisal of the Dental Literature: Papers About Therapy
- Part VI. Critical Appraisal of the Dental Literature: Papers About Diagnosis, Etiology and Prognosis

The articles in this series, along with other helpful resources on EBD, can be found under Web Resources (Evidence-based Dentistry section) on the CDA Resource Centre section of the CDA members' website (www.cda-adc.ca/en/members/resource/resources/index.asp#10).

Other resources on EBD

Hackshaw A, Paul E, Davenport E. Evidence-based dentistry: an introduction. Oxford: Blackwell Munksgaard; 2006.

Clarkson J, Harrison JE, Ismail AI, Needleman I, Worthington H, editors. Evidence based dentistry for effective practice. London: Martin Dunitz; 2003. ✦

If you would like more information on locating research articles, search strategies or help with how to use online resources, please contact the CDA Resource Centre at library@cda-adc.ca.

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Reference

1. Rabb-Waytowich D. Evidence-based dentistry: Part 1. An overview. *J Can Dent Assoc* 2009; 75(1):27–8.