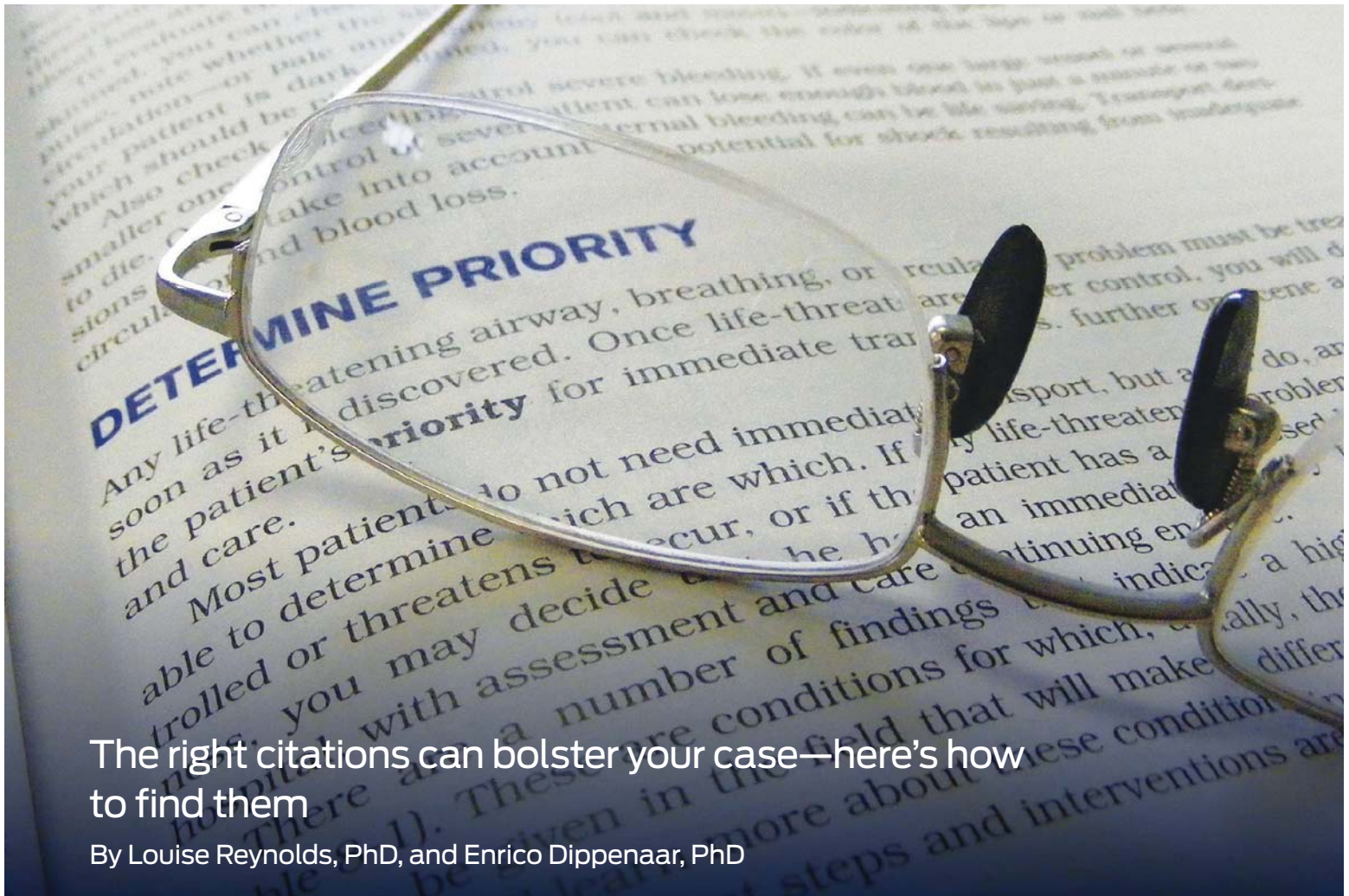# HOW TO SEARCH
THE SCIENTIFIC LITERATURE

The right citations can bolster your case—here's how to find them

By Louise Reynolds, PhD, and Enrico Dippenaar, PhD

The technology age has brought us electronic "superhighways" that allow humans to share vast amounts of information at the drop of a hat. Sharing knowledge and experience cultivates our wisdom and understanding of the world and helps us solve complex problems, but today we must negotiate a daily information overload, which can be a daunting task. Being able to quickly and easily access quality information is essential to the performance of EMS and countless other jobs.

The wonderful thing about technology is that anyone can search for scientific literature at any time. The days of sifting through dust-filled library racks have

long passed—today, assuming Internet access, you can search from the comfort of home.

You might recall from your studies when a literature search was required for completing an assignment, drafting a research proposal, or merely to gather information to improve your clinical practice. We are constantly on the lookout for new information. A common misconception is that a literature search equates to undertaking research.

Although literature searches form part of a research process, the purpose of a search is to gather the information you want for a specific purpose. The first consideration is to establish what type

of literature you want and what you need it for, as this will determine where and how you commence your search.

Literature Types

Literature is a broad term used to describe written text. There are two main types of literature, research and nonresearch. Research literature usually takes the form of academic publications, such as articles published in peer-reviewed journals following research studies.

Grey literature usually refers to pieces of research completed within organizations that have not undergone similar rigor or peer review. Other varieties, such as books, reports, news articles,

Figure 1: The CINAHL database displays a combination of keyword concepts. Limits can be applied to searches around parameters like language and time frame.

Figure 2: Search inputs among databases vary. This screenshot from Google Scholar uses keywords and Boolean terms.

websites, and many more, are all forms of nonresearch literature. Your specific needs will determine what types of literature you search for.

Search Where?

Although search techniques are also commonly applied to nonresearch, this article focuses on the searching of traditional research literature. Once you've determined what literature you'd like to search for, the next step is to identify an appropriate search platform.

There is a wide variety of search platforms and databases available for public access. Depending on the publisher, some literature pieces are open-access, so you can view and download the original articles without a subscription. With others you will only be able to view the abstracts or portions thereof, and you must pay a subscription or library fee for access to the full text.

Most academic institutions and some private research organizations will have paid for subscriptions that can be accessed through internal links, e.g., uni-

versity libraries. Below are 10 commonly used search platforms and databases:

- CINAHL, https://health.ebsco.com/ products/the-cinahl-database
- Cochrane Library, www.cochranelibrary.com
- Google Scholar, http://scholar.google.com.au
- MEDLINE, https://health.ebsco.com/ products/medline-complete
- Ovid EmCare, www.ovid.com/site/catalog/databases/14007.jsp
- PubMed, https://www.ncbi.nlm.nih.gov/pubmed/
- ScienceDirect, https://www.sciencedirect.com
- Scopus, https://www.elsevier.com/ solutions/scopus
- UpToDate, https://www.uptodate.com/home
- Web of Science, https://clarivate.com/products/web-of-science/

How to Search

After you've identified and gained access to the literature platforms or databases,

it's useful to take a structured and planned approach to searching. There are a couple of things to consider when you start typing in words to search.

Search keywords are the words, terms, or concepts you input to match similar words or terms in the literature. Choosing keywords is crucial, as the words you use will determine the outputs you get back. Keep in mind synonyms or related terms, acronyms, variations in spelling, plurals, medical and common names, and country-specific terminology.

Use words that are unique to the literature you are searching for and avoid using sentences. Focusing on these key concepts will reduce the amount of search time you will waste finding irrelevant articles.

Boolean operators are the words a*nd, or,* and *not.* They are used to connect your search keywords and match the specific literature you're searching for into a "search string." Examples: The use of *child AND mother* will return literature with both words in its text. The use of

child OR mother will return literature with at least one and in some cases both words in its text. The use of *child NOT mother* will return hits containing the word *child* but exclude all those containing *mother* even if the words *child* and *mother* appear in the same literature piece. The search string, when typed into the search engine, will drastically reduce your time and improve relevance by refining your results.

Truncation is the use of root words to find variations. With the use of an asterisk, you can use a root word like *child** to find *child, children, childhood,* etc. Just be aware that using truncation may lead to finding literature that may not be relevant to your search.

Phrase searching is useful when there is a specific phrase common within your field. Using speech marks (quotation marks) will combine the words and return literature containing the entire phrase in its text.

Advanced searches and limits can be used to either include or exclude parameters such as the language of the literature, year published, country, author, literature type, category, etc. Advanced searches are easy to set up and enable more precise searching of the literature you want.

Search documenting is one of the most important aspects of any literature search. You should be able to reasonably reproduce the same outputs from the same search inputs so you can verify and share the search with others.

Figure 1 is a screenshot from the CINAHL database that shows a combination of keyword concepts for a search on using music to alleviate agitation in dementia patients. Parameters can be applied to limit results to articles published in English within the last five years. You will find that the various databases' best search input varies. *Figure 2* is a screenshot from Google Scholar showing a simpler search combination.

Conclusion

As a paramedic you may be required to perform a literature search as part of your clinical practice, for studies, or for general interest. The results of your search will enable you to gather information about a specific topic. The process of literature searching can be undertaken easily with the steps outlined above. The more you practice basic searching techniques, the easier it will become, and the better you will be able to pinpoint the information you're looking for. ✳

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