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**The purpose of the literature review is to place your clinical question in the context of the existing scientific literature. This article will help you to develop an overall conceptual framework to allow you to sort through the mass of published material in a focused way. The conceptual review differs from the individual article review in that it is guided by your understanding of the basic issues rather than by your knowledge of research methodology. The goal of this paper is to help you develop a conceptual framework starting from your clinical knowledge. A specific search strategy is presented to help you determine which articles are highly relevant to your topic and to locate all of these published within the past 5 years. Articles are classified into three types: those that are obviously highly relevant, other less relevant articles and articles that are potentially relevant. Guidelines are given on how to start looking, when to stop looking, how to organize the articles you find so that you can review them in a reasonable amount of time and how to read in depth the most pertinent ones you can find. In medical school my librarian told me that I did more literature searches than any other student, and more than all except one faculty member. Over the years I have done almost 10,000 searches. I hope to pass on some of what I have learned to help you become better clinicians.**

As a clinician you notice a problem in one of your patients which is difficult to treat. You are sure that modern science in all its wonders has developed something new. So you start by looking into the scientific literature, hoping to find something useful. To do this, you need to know how to start looking, when to stop looking, how to organize the articles you find so that you can review them in a reasonable amount of time and how to read in depth the most pertinent ones you find. Along the way, you will have 1) learned something, 2) gotten enough material to give a talk, 3) developed a review of the literature that will serve as a base for treating many patients with similar conditions, 4) contributed to the deforestation of your country or 5) all of the above.

You will probably want to do a fairly thorough search of the literature. You will be looking for three types of articles: those which are obviously highly relevant (i.e., did someone figure this out?), other less relevant articles and articles that leave you with a nagging feeling that you should read them. I will refer to these as A, B and C articles, respectively. The majority of the articles or titles of articles you look at will be in the X category (that is what you draw on them). These are the ones that you don't want to read, are not relevant and never will be relevant. You only keep them to be sure that you don't accidentally try to read them again.

Most of us start our literature review with "I wonder whether slings really work to prevent shoulder subluxation" or some such question, and want to see whether there is already an answer before we go to the effort to work out the treatment for our patient. We, therefore, start our literature search only to find the A articles, just to see whether the study has been done previously. After that, we further define our question.

Ideally, you would start by going to an expert in the field and asking whether she has seen this problem before, has figured out a treatment, and for a list of suggested readings. But, if you could do that, you wouldn't be attending this journal club of "how to read" research articles. I am presuming that you have a general familiarity with the information provided by general textbooks, which provide a guide to literature sometimes as recent as 2 years before the publication date, but usually older. The purpose of the literature review is to place your clinical question in the context of the existing scientific literature. This article will help you to develop an overall conceptual framework to allow you to sort through the mass of published material in a focused way. Right now, what motivates you to struggle through the literature is a desire to understand the area, a personal interest. So your understanding is its own immediate reward, as well as making your review easier.

### **THE INDIVIDUAL ARTICLE REVIEW**

Reviewing the literature is usually approached by evaluating articles one at a time. An excellent series in the *Canadian Medical Association Journal*<sup>1-5</sup> allows the busy clinician to quickly determine which articles should be read and which should be passed by. These are useful if you want to 1) learn about diagnostic tests, 2) learn the clinical course and prognosis of disease, 3) determine etiology or causation and 4) distinguish useful from useless or even harmful therapy. When you have selected a specific article for in depth study, the series by Elenbaas<sup>6-8</sup> provides excellent guidelines for detailed analysis of each part of the paper, from literature review to methods, analysis and conclusions. For the novice both of these approaches can be overwhelming, and are most useful for formal journal clubs. We will review several papers in this fashion regarding clinical questions you have submitted in advance, but that won't help you much when you get home and have more questions. I am going to suggest a different approach.

### **THE CONCEPTUAL LITERATURE REVIEW**

The concept review differs from the individual article review in that it is guided by your understanding of the basic issues rather than by your knowledge of research methodology. This allows you to build upon your strengths as a clinician. Most basic academic approaches assume that the student has neither clinical nor academic skills and can be very dry and boring. The goal of this workshop is to help you develop a conceptual framework starting from your clinical knowledge. A specific search strategy is presented to help you determine which articles are highly relevant to your topic and to locate all of these published within the past 5 years.

If you are taking your literature review further, for development of a specific clinical program for example, you will continue to locate the *B* and *C* articles that are of lesser relevance. From a practical standpoint, you will need to reduce the size of your list of articles to the point where at least 30% are at least potentially relevant and where it contains no more than 50-100 relevant articles. Otherwise you will never finish. The less time you have to read, the smaller the final list. With any computerized literature search, there is always a trade off between thoroughness of the search (relevant and potentially relevant articles found) and precision (percent of articles retrieved that are relevant). You can expect to retrieve 50-70% of the relevant articles with a precision of 30-20% using a computer search of title, abstract and topic.<sup>9</sup> The strategy proposed here is, therefore, a combination of computer and manual searches.

### **HOW THE CONCEPTUAL LITERATURE REVIEW DIFFERS FROM THE INDIVIDUAL ARTICLE REVIEW**

1. Articles are not reviewed in an isolated way but rather in an integrated fashion. Certain experimental designs provide stronger evidence than others and many teachers insist that you read only scientific papers based on random controlled trials. But the state of the art in fascia is such that, if you did this, there would not be many articles left to read. Furthermore, such a restriction is not necessary, as evidence from multiple studies that are conceptually related can provide stronger support than isolated results. But, to integrate multiple studies, you must have a conceptual framework. If one is not immediately evident in the field, you must develop your own. For novice clinicians, this is not easy especially since your understanding is constantly changing as you do more work in a given area. But it is very important for you to identify some concepts early in the review process, for you otherwise can get lost in the mass of published articles, spending time in areas that are not central to your main concern.

2. Articles that are methodologically flawed are not discarded from review. This means that you can start your review even if you do not know a great deal about scientific methods as you do not need to be able at this point to identify all the possible flaws. If you were reading articles to see whether you should adopt their particular methods in your clinical practice, you would need more methodologic sophistication as their results should not be immediately incorporated into clinical care because of these flaws. But, in the context of other studies, the results of these flawed papers can be supportive of more general concepts which you can use to design your own treatment.

3. The goal is not adoption (or not) of a particular method in clinical practice, but examination of the state of the art in treatment in a particular area. For this, one seeks the overall trends as well as specific details of the most relevant articles. The purpose of the literature search is, therefore, quite different. Rather than seeking a small number of highly relevant articles to a single issue, a broader approach must be taken.

4. Your conceptual framework will be different from that of the writer of the article you are reading. Therefore, you will be interpreting their results from your viewpoint and may even want to reanalyze their data as best you can from what they have presented. In the most extreme case you may want to use their data to support opposite conclusions.

5. The combination of the literature search and construction of the conceptual framework may require three to five attempts. This is in contrast to a straightforward literature review on a topic such as treatment of the subluxed shoulder in persons with stroke. Librarians who can get your literature search done within 1 week are providing excellent service, which is quite adequate for the single topic search. But this means that your comprehensive review can take you more than a month. The solution is to sit with the librarian while the search is being completed so that you can review the results of your search and do a second or third search at the same session. If this is your first bibliographic search, I do not recommend doing the search yourself on a computer as you will get needlessly frustrated at running the computer-it is hard enough just getting these bench science concepts straight. Once you are skilled in searches as well as in use of a computer, you will probably want to do this yourself.

It is also very helpful if you can find a librarian who understands your clinical material and has a good sense of which articles will be highly relevant. Many of the larger clinical facilities in academic centers have librarians with clinical background. After the initial search, such persons are likely to find other articles in the course of searches for other persons that can be passed on to you. I strongly recommend that you pull your articles from the library shelves for copying yourself, as in this process you are bound to notice something else that is pertinent.

6. Many of us have had some experience in a journal club, where we reported individual papers (e.g., Jones in 1986 studied  $x$  and found  $y$ ). Much of our academic training is similar: reproducing

what was said in a single lecture or reading. But the conceptual review is written from common themes (e.g., self-care has been studied from the standpoint of persons with amputation (Jones 1986, Dither 1942) and spinal cord injury (reviewed by Caruthers 1985), but little work has been done using subjects with muscular dystrophy). The first approach is commonly taken by persons writing papers and theses for degrees, where the primary concern is convincing your advisors that you have mastered specific material. Focusing on individual study details that are more or less relevant to your current question results in a very long document. But you are a busy clinician, swamped with paper. To choose just what is pertinent you have to have a conceptual framework.

## **STEPS FOR A CONCEPTUAL REVIEW OF THE LITERATURE**

### *I. Locate Two to Four Highly Relevant Articles* Getting Started

The problem with fascia related research is that it is scattered across hundreds of journals, and relevant basic science may not even use the word “fascia.” Usually you will already know several important articles from your general reading, but, if not, sit with your librarian for a quick literature search to locate them. You can also scan the table of contents from the *Journal of Bodywork and Movement Therapies*, which has a section devoted to fascia in each issue. Some major researchers do publish there, especially invited papers after each fascia congress, and you can look up their names to track their other publications.

#### Identifying Key Terms

Once you have two to four highly relevant articles, ask your librarian to see how these articles are indexed in a computerized data bank such as Medline. You will be looking for major and minor medical subject headings (MESH) as well as keywords that often appear just after the abstract in the journal. A handbook of the MESH headings used by *Index Medicus* is available in most libraries and you can scan this also for relevant entries, but it is easier just to see how several specific articles have already been categorized.

As well as looking for specific topics that define your articles, you should also consider terms that restrict the size of your search. Restricting to studies involving humans and written in English are commonly used to decrease search time, although now, with English translations of the abstracts of foreign literature, there is some benefit to at least getting the abstracts.

The library of congress in the US sponsors PUBMED, and searches there are free. Abstracts are always available, and often the full text of the article is as well. Publications from all research funded by the US Government are required to have a version available – usually this is close to the final version if not identical to it, just missing the final formatting.

### *II. Search for Articles Based on Classification of Relevant Articles*

A. Do a computerized literature search of the past year only, based on the headings that arose from the 2 to 4 articles you located in Step 1. If fewer than 30 articles are retrieved, include additional years until you have at least 30 or have gone back 5 years. Print out TITLES ONLY, if you have that option.

B. Review the titles and mark those that are potentially relevant. If this is less than 30% of the total generated, look only at those titles that seem to be highly relevant, see how those articles are indexed, and repeat the search using more specific criteria.

C. Print out TITLE and ABSTRACT. Review the abstracts of those thought to be relevant on the basis of the title and classify as highly relevant, relevant, possibly relevant and not relevant. If, at this point, the number of articles not relevant on the basis of title or abstract is more than 70% of the total, print out the index terms for the highly relevant articles and redo the search as you have too much information to digest and process.

D. Identify the two or three journals that have the largest number of articles that are at least potentially relevant. Review the table of contents of the previous 12 months of these journals for additional potentially relevant articles. Make copies of the highly relevant and definitely relevant articles as you already have the journal in your hands, although you need not read them in detail yet. If you find all of these articles in your literature search except those too recent to be indexed, congratulations! If you don't, see how these articles are indexed and repeat your computer search.

If you have any question as to which are the most important journals, journals are scored by an "impact factor." This is basically how often papers in this journal are cited by papers in all journals (including this one). Many journals have a low factor, 0.5 -1.0 (Journal of Manual and Manipulative Therapy). Anatomical Record and Journal of Bodywork and Movement therapy are 1.5. 2-3 is middling (Journal of Applied Physiology, Physical Therapy), 7 is great and above 10 is outstanding – Journal of the American Medical Association (JAMA) is 44 and New England Journal of Medicine (NEJM) is 72.

### *III. Do Literature Search for Previous 5 Years*

A. Based on the topics from your most recent search, obtain a printout of author, title, journal and abstract for the most recent 5 years. Mark the articles as highly relevant, relevant, possibly relevant and not relevant (A, B, C and X).

B. Obtain copies of the highly relevant articles and quickly scan their bibliographies. Did you find all of the articles in these bibliographies that seem important in your search? If not, find out how the articles you missed are indexed and repeat your search.

C. If you are confident that this is your final search, put all of your old (dated) searches in a folder and don't use them again unless absolutely necessary. You are only keeping them as a record of the steps you went through in case you need to repeat the process later. Your most recent search should contain everything important from the previous ones. Otherwise, you will wind up requesting the same article two or three times.

### *IV. Construct a Conceptual Framework*

A. Review your highly relevant articles to identify the major issues. At this point it is helpful to write a few notes on the front page of each article detailing the major points and areas covered.

B. Construct a framework for classification of all your relevant articles. If this is difficult, list each major point and author on a file card (one card per point, not one per article) and then sort your cards in some fashion that makes sense to you. You don't have to include all the points, just most of them.

C. Go through your literature search and mark, next to each A, B or C article, the major categories into which it falls according to your schema.

D. Draw a table listing author and year under each conceptual category.

E. Are there areas that have no or few references? Are you sure you can't find more articles in these areas? At last you are ready for the final step of your literature review, the writing.

### *V. Deciding if Bench applies to Bedside*

Although it is tempting to stop at this point, it is only by writing down your proposed treatment that you really know how well you have done. If you keep your articles in a file for future use, it can be difficult to come back to them 1 or 2 years later if you have not done this final step. You often can publish this as a case study, especially in state medical journals. It is ready in case you want to volunteer to write a chapter for a book or for medical student and resident teaching.

A. Block off some uninterrupted time. Up to this point, you can work productively in 10-45-min blocks, looking at individual papers. Synthesizing all of these, however, is done much more efficiently in at least 4-hour blocks.

B. Develop an outline for your new treatment plan that covers the points you wish to make, the rationale for your treatment and also covers objections likely to be raised by your friends and enemies. Resist the tendency to write detailed paragraphs until you are comfortable with your entire outline, as it is much easier to move parts of an outline than paragraphs. It is also much more difficult to avoid redundancy when you move text, as you become much more attached to the words than you do when working with an outline.

C. Write the major sections of your treatment. Do your thoughts flow well from one area to the next or do you need to add transitions? At this point, you will likely move whole chunks of text to achieve better readability, but, if you keep your outline current, you can use this as a guide to where to put text. Otherwise, it is too easy to repeat the same material in many places.

D. Let your treatment plan sit for 2-3 days before you do the final polishing and editing. Then give it to a friend who has not been involved in your project to see whether they can make sense out of it.

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NOTE: This is adapted from a paper I wrote more than 25 years ago. The concepts and the references are still quite relevant to issues facing the clinician. While the issues may change, the

approach to them remains similar over the years.