



## levels of evidence

Research literacy is important to massage therapists for several reasons. Research supports the theoretical foundation of any discipline, and is used to separate treatments that are effective from those that are not. As complementary and alternative (CAM) therapy providers, it is critical for massage therapists to evaluate existing research to make decisions about the care we give to our clients. If we learn that a particular technique works with clients who have low back pain should we change the way we currently practice?

By understanding relevant research, we may choose to introduce new ways of working with clients, or discard other methods that do not appear to offer any benefit. How do we decide? Research literacy gives us the tools to assess the quality of evidence presented in an article or research report, and make an informed decision. The bottom line is this: don't just

### RESOURCES

For more information about research go to [www.massagetherapyfoundation.org](http://www.massagetherapyfoundation.org)  
[www.nccam.nih.gov](http://www.nccam.nih.gov)

believe or automatically dismiss everything you read.

Research literacy is also a valuable skill for individuals who wish to be an active participant in their own health care. Results of recent research are frequently reported in the media, and coverage tends to be sensationalized to attract viewers and sell advertising. “Is your daily cup of coffee making you sick? Find out at 11 tonight!” But if you know how to read the original research article, you can then make up your own mind.

### Research Literacy and The Massage Therapy Foundation Research Conference

The last issue of *mtj* reported on the recent Massage Therapy Foundation conference, “Highlighting Massage Therapy in CAM Research.” The conference focused on the importance of creating both individual and structural supports to increase both research literacy and capacity—the ability to participate in and initiate research. The conference included workshops on building these skills as well as presentations of findings from recent studies.

One of the sessions at the conference was a panel discussion on levels of evidence. We think this concept is a great place to begin understanding some basic principles of how research works. Health care in general is moving toward an evidence-based standard of care. That is, health care treatment interventions need to be empirically tested and demonstrated to be safe and effective.

### How Do We Know What We Know?

First, let’s consider how we know what we know. There are at least five different ways of knowing: tradition, authority, trial and error, logical reasoning, and the scientific method.<sup>1</sup> The first two are based on taking someone else’s word for it. The other three are increasingly more systematic ways of evaluating the accuracy of knowledge claims.

**Tradition** is based on the idea that certain cultural practices continue “just because that’s the way it’s always been done.” However, tradition inhibits the search for new approaches and may perpetuate ideas that are even contradictory to available evidence. Authority is based on the opinion of experts who have distinguished themselves in their fields. But all authorities are subject to error. A good example of the problem with relying on tradition or authority is provided by Dr. John Kellogg.

Kellogg was an influential physician trained in massage in the early 1900s, who stated that massage was a contraindication for people with cancer. For decades, massage therapists assumed this was true and avoided working with cancer patients. Based on more current information and recent research we now know that massage is beneficial for reducing the discomfort associated with the treatment of cancer.<sup>2</sup>

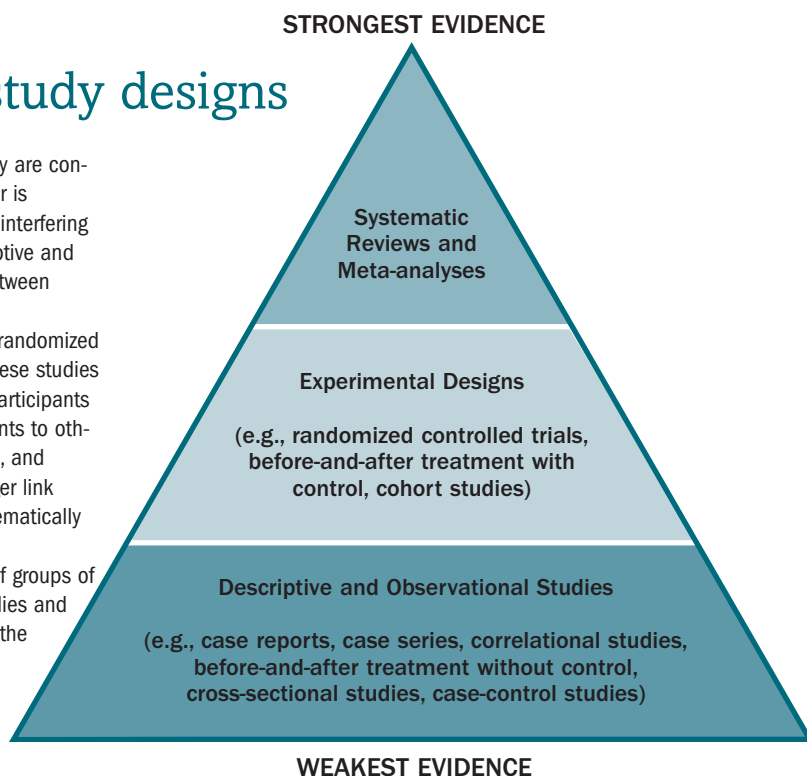
With **trial and error**, individuals try one approach and evaluate its effect. The process ends once a successful approach is found. The problem is that potentially better solutions never get tested. Perhaps a massage client has a sore trapezius mus-

## hierarchy of research study designs

All of the studies from case report to the case-control study are considered descriptive or observational; that is, the investigator is describing or observing what is naturally occurring without interfering in any way and then reporting what he or she sees. Descriptive and observational studies can be used to note associations between events and to generate hypotheses.

The before and after treatment with control, cohort and randomized controlled trial are examples of experimental designs. In these studies the investigator is actively intervening by assigning some participants to receive a treatment and then comparing those participants to others who receive a different intervention (or no intervention), and reporting the results. Experimental studies provide a stronger link between cause and effect; in these the investigator is systematically testing hypotheses.

Meta-analyses and systematic reviews are evaluations of groups of studies on a specific research question. By combining studies and then assessing them as a group, the authors can evaluate the weight of the evidence as a whole on that question.



*Making Sense of Research: A Guide to Research Literacy for Complementary Practitioners, By Martha Brown Menard. Curties-Overzet Publications, 2004*

cle; the client does nothing and eventually it gets better. Doing nothing works, but the client will never know if something else might have worked better or quicker.

In **logical reasoning**, individuals apply deductive or inductive reasoning to think their way through a situation. Deduction starts with a general premise, such as heat increases circulation and relaxes muscle, and then applies the general premise to a specific situation, in this case, that sore trapezius muscle. The opposite process occurs with inductive reasoning. Specific examples or cases are observed and a more general theory is then generated. The potential problem is that the validity of a given conclusion based on observations can be limited by a small number or a narrow range of observations.

**Scientific method** is the most rigorous way of acquiring new knowledge; it is based on the idea of testing whether a hypothesis can be demonstrated to be true or false. We assume that there is a single observable and measurable reality, one that we can all perceive and agree upon, and that there is a relationship between cause and effect. In order to understand how cause is related to effect, the scientist or investigator must ask questions and gather relevant information in a systematic way. The hypothesis or research question determines the kind of information necessary and the methods used to test its veracity.

The beauty of scientific method is that it presents evidence that all observers can see. Another is its insistence that all knowledge is provisional. Because new information could be discovered at any time and show that what we thought was

true is completely incorrect, scientific method works best by showing that a hypothesis is false. We can only show that a hypothesis has survived repeated attempts to disprove it, and accept it with the caveat “as far as we know now.” Once a hypothesis has been demonstrated to be false, however, it remains that way. The history of science is full of numerous examples—at one time everyone knew that the earth was flat.

### Levels of Evidence

In many kinds of health care research we want to know whether a certain therapy (cause) is responsible for a particular outcome (effect). For example, does massage help premature babies gain weight? What factors (cause) contribute to developing an illness or promoting health (effect)? In critical evaluation of a journal article, we are assessing the evidence that the authors have presented. How well have they argued their case that this therapy or factor is responsible for that result?

To learn about NCCAM's provisional funding for 2006 and their general guidelines for research funding projects, go to [www.nccam.nih.gov/research/strategy/2006.htm](http://www.nccam.nih.gov/research/strategy/2006.htm).



## how to find the evidence

You have a better understanding of why research is important and the levels of evidence out there, but where do you begin to find it? Going into new territory can seem daunting, but here are resources that can help you.

- \* **DO A PUBMED SEARCH**, ([www.pubmed.gov](http://www.pubmed.gov)) a service of the National Library of Medicine, that includes more than 15 million citations from peer-reviewed scientific journals. The citations go back to the 1950s. PubMed also has a Clinical Queries option that helps you find the best evidence—such as systematic reviews—quickly in the literature.
- \* **VISIT YOUR LOCAL PUBLIC OR UNIVERSITY LIBRARY**. Librarians are trained to help consumers and researchers find the information they need. They can walk you through online searches and help you gather other information from various sources.

## how to create the evidence

- \* **THE MESSAGE THERAPY FOUNDATION**. One of the primary purposes of the foundation is to fund solid research studies investigating the many beneficial applications of massage therapy. Foundation research grants are awarded to individuals or teams conducting studies that promise to advance our understanding of specific therapeutic applications of massage, public perceptions of and attitudes toward massage therapy, and the role of massage therapy in health care delivery. For more information, visit [www.massagetherapyfoundation.org](http://www.massagetherapyfoundation.org).
- \* **THE NATIONAL CENTER FOR COMPLEMENTARY AND ALTERNATIVE MEDICINE (NCCAM)**. NCCAM offers different funding opportunities for those interested in conducting their own research. Check out [www.nccam.nih.gov/research](http://www.nccam.nih.gov/research) for more information about NCCAM funds, types of grants offered, who can apply for funding, current funding announcements, and policies and guidelines.

In any research article, the authors are presenting their findings and offering their interpretation of what those findings mean. In other words, the author is making a case for the reader to decide to what extent he or she accepts, accepts with reservations, or rejects the evidence presented, based on how strongly the authors have linked cause with effect. Levels of evidence refers to the idea that there are varying degrees or levels of evidence that different kinds of research studies can provide. It's rare that a single study demonstrates a hypothesis so conclusively that it is beyond question. The more common scenario is that a body of evidence accumulates, study by study, with different studies contributing different degrees or kinds of evidence.

The relative strength of each design is shown schematically in the pyramid illustration on page 152, with studies that provide weaker evidence of cause and effect at the bottom of the pyramid and those that provide the strongest evidence at the top. Other authors have used the idea of an evidence house.<sup>3</sup>

In subsequent columns, we will go into more detail regarding the strengths and weaknesses of different kinds of research designs, and provide examples of how to evaluate a research study. We look forward to receiving your questions and comments. ■

#### REFERENCES

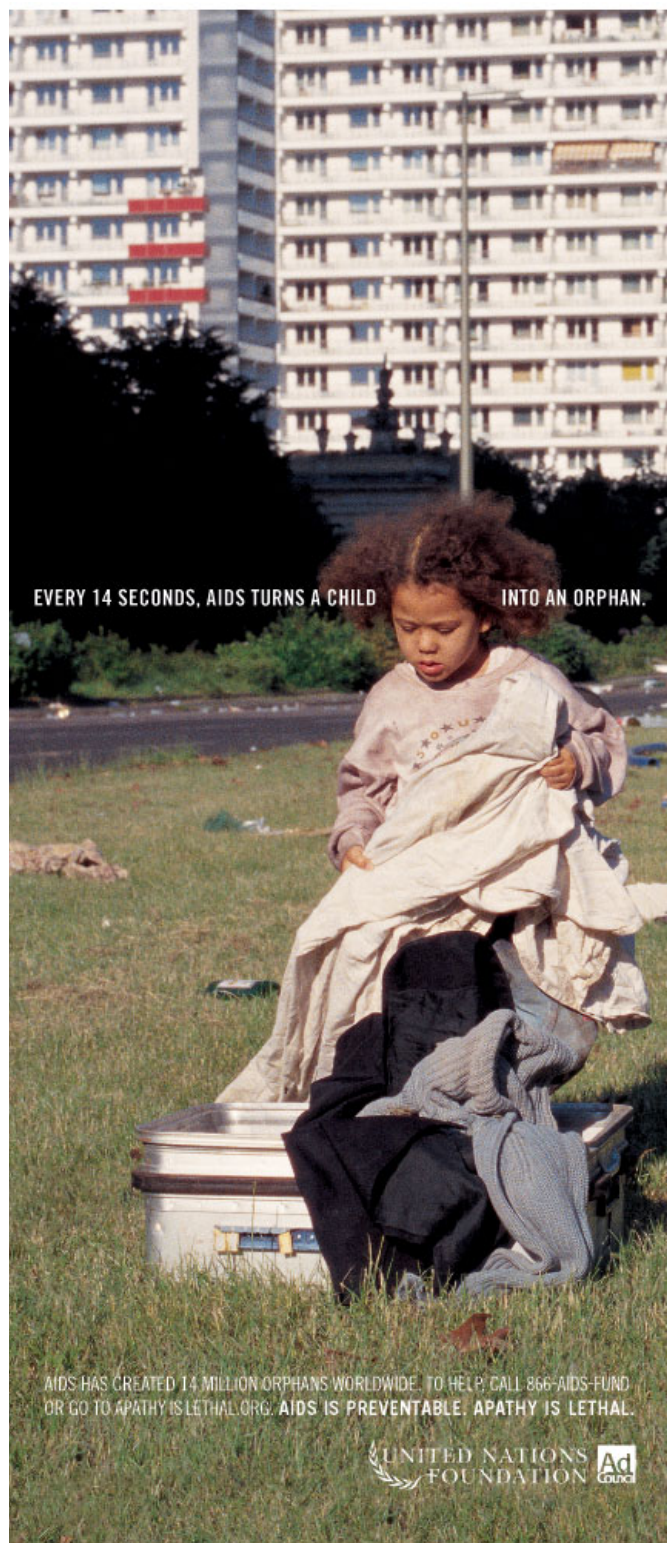
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