Perspectives

BE WARY OF EXPERTS CITING EVIDENCE

The terms evidence and L evidence-based dentistry are enjoying ever-increasing popularity as more experts climb on the "evidence-based" bandwagon. Where earlier generations of experts simply relied on their reputations to support their observations, it is now common for lecturers to assure their audiences that evidence supports their claims and perhaps to offer references to that effect. Although this would seem to be a welcome advance by thoroughly grounding such presentations in the scientific literature, it is wise to be a bit skeptical. It's worthwhile taking a little time to consider why practitioners should always be cautious in interpreting allusions to "evidence" until the type of evidence being cited becomes apparent.

During the 12 years in which it has been used,¹ the term *evidencebased* has always referred to information that has been gleaned through a process that includes a thorough search for all available information pertinent to a given clinical question, followed by an assessment of the validity of the best of that information and the synthesis of an answer for the clinical question, if possible, from the information.^{2,3} The concept underlying evidence-based medicine and dentistry is that the evidence includes everything that is known about a particular question, not just a few selected facts. Thus, the citation of one or a few references that support a particular position or opinion does not necessarily mean that the position is evidence based. In other words, within the context of evidence-based dentistry, *evidence* is a collective noun.

An example from the current literature may help illustrate the difference between an evidence-based position and evidence cited in support of a position. It is quite possible to argue that periodontitis is associated with cardiovascular disease and to support that position with evidence of the association.4,5 However, it is also possible to argue against such an association and cite evidence to that effect.6,7 When all of the available evidence is considered, as has been done in three systematic reviews that have appeared within the past year, the best current answer to the question of whether periodontitis is associated with cardiovascular disease is that, although there appears to be



a weak association, it has not been proven conclusively and no claims of causality are possible.^{8–10}

So, to make an evidence-based claim, you must first find all of the evidence, select the best, assess its validity, and then apply it to the clinical question at hand. Originally, clinicians were expected to answer a clinical question by performing these steps themselves. As the concept of evidence-based practice has deepened and matured over the past decade, it has become apparent that most clinicians have neither the time nor the training to fully accomplish these steps. Partially as a result, systematic reviews have proliferated in both medicine and dentistry. These assessments of all available information for a specific clinical question are now considered the epitome of evidence.^{2,3} Although more than a thousand systematic reviews are available in medicine, the current number addressing clinical dental topics is probably no more than

200; however, the number is increasing rapidly.^{11–14}

What is it about the systematic review that has catapulted it to the top of the evidence chain in such a short time? It is its ability to minimize or at least control the bias of the reviewer and the bias in what is being reviewed when addressing a question. With respect to reviewer bias, most literature reviews do not have any formal rules for searching for relevant studies or for deciding which studies to include. It is easy either to conduct an incomplete search or to select studies that support a reviewer's preconceived ideas. In both instances, the review (ie, the evidence) is biased and cannot be assumed to represent what is actually known about the clinical question. Systematic reviews, by requiring the reviewer to adhere to established search and selection protocols and to report exact search methods and selection criteria used, effectively minimize these sources of bias. The posing of a specific clinical question to be answered also helps ensure that the selected studies are actually relevant to the problem.

With respect to bias in scientific papers, all studies are open to bias. As you learned in dental school, there is a hierarchy among research studies, with the randomized clinical trial being the strongest research design, that is, the least susceptible to bias.¹⁵ But within each level of the hierarchy, certain study features are more effective at minimizing bias than are others. Methods used in systematic reviews demand that the reviewer not only identify the studies with the strongest available designs-those with the least likelihood of bias-but also evaluate these studies to determine the extent to which the methods used were likely to control possible biases.15 Obviously, the less likely a study is to be biased, the more likely it is that the study results are valid, One of the most valuable contributions of a systematic review is this assessment of the "strength" of the evidence that is available to answer a question.

So, when you hear an expert pontificating on the evidence, what should you do to determine whether it is "evidence based"? Why not ask the expert whether any systematic reviews have been published on the question being discussed? If the expert does not know, then the search has not been thorough and the presentation is likely to be biased. If the answer is no, ask the expert if his or her approach to assembling the evidence meets the essential hallmarks of a systematic review, that is, the gathering of evidence has been thorough, has identified the strongest studies, has assessed their validity, and has synthesized an answer to the question at hand based on the results of the studies and a knowledge of their strength. These are the new standards that experts should meet if they purport to render evidence-based opinions. The American Dental Association's policy on evidence-based dentistry explicitly identifies these standards,¹⁶ and we can but hope that they will be adopted by those who present evidence.

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