



## Evidence Based Dentistry- Need Of The Hour : A Review

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### Abstract

Evidence-based dentistry is the integration and interpretation of the available current research evidence, combined with personal experience. It allows dentists, as well as academic researchers, to keep abreast of new developments and to make decisions that should improve their clinical practice. The evidence based dental care paradigm implies that clinicians must regularly update their knowledge base by actively and critically digesting new scientific literature. Assessment of scientific evidence consists of three steps: firstly, the retrieval of evidence; secondly, the evaluation of individual studies for the quality of evidence and finally, the synthesis of the combined evidence from multiple studies to make conclusions about the evidence on a particular topic. The objective of this literature review is to impart knowledge to the dental practitioners on the basic concepts of evidence based dental care for the well being of the patient.

**Key words:** Evidence based; Dentistry; Guidelines.

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### INTRODUCTION

Oral disease is widespread and most people, from children to the elderly, will seek dental care at some point, either for a check-up or for treatment following clinical symptoms. With evolution people are living longer and more will retain most or all of their teeth. Furthermore, changing diets and lifestyles affect patterns of oral disease and there are constantly new advances in treatments. All of these have important implications for effective dental care management.<sup>1</sup> In dentistry there are well-established causes of oral disease, and diagnostic methods and treatments that work. There is also bad practice: there may be tests and treatments that are effective but not commonly used and, possibly worse, tests and treatments that despite being ineffective are used. How can we decide what is a cause of disease and what is not, and what is an effective treatment and what is ineffective? Evidence-based dentistry is the integration and interpretation of the available

current research evidence, combined with personal experience. It allows dentists, as well as academic researchers, to keep abreast of new developments and to make decisions that should improve their clinical practice.<sup>1</sup>

The American Dental Association<sup>2</sup> has defined evidence-based dentistry as an approach to oral health care that requires the judicious integration of:

- systematic assessments of clinically relevant scientific evidence, relating to the patient's oral and medical condition and history, together with the
- dentist's clinical expertise and
- the patient's treatment needs and preferences

Decision making is an essential part of oral healthcare. It involves diagnostic and therapeutic uncertainties, providers' heuristics and biases, patients preferences and values, as well as cost

considerations. A model for the factors influencing decisions in healthcare was described in 2000 by Chapman & Sonnenberg<sup>3</sup> The decision-making model describes two major components, the normative and the descriptive, which are involved in decision making. The normative aspect of decision making relies on quantitative information derived from systematic reviews and predictive models on the probabilities and uncertainties of treatment outcomes. Clinical outcomes, such as survival or success of a tooth or a restoration, are assessed based on the utility they offer to the patient and their costs. Normative analyses allow quantitative comparisons of alternative therapies and can identify optimal treatments for multiple attributes. The descriptive aspect in decision making involves cognitive processes and biases of both providers and patients that translate the normative information into clinical action.<sup>4</sup> Bader and Shugars<sup>5</sup> in 1995 made the following valid though acerbic comment upon the quality of information based on which dentistry is practiced. They observed that "information which a lay observer might assume to be the very bedrock of the dental profession all too often resembles quicksand".<sup>5</sup> The poignant situation of the dental practitioners was highlighted by the Reader's Digest special report "How honest are dentists?" in the February, 1997, issue of this widely read magazine in the popular press. The article noted that "dentistry is stunningly inexact science."~ It is therefore becoming increasingly clear in this "age of Information" that investigative journalism and consumer activism render all clinical decision-making subject to external scrutiny rather than to just professional or peer-reviews in the past. It is incumbent, therefore, that dental practitioners deliver care that will withstand external scientific review as apparently evidence based care is here to stay rather than be just a passing fad of the day.<sup>6</sup> Decision making in healthcare occurs at three broad levels: the level of lawmakers and governmental regulators; the level of insurance plans that determine coverage and reimbursement for healthcare; and the level of the provider and patient. What is of utmost importance is the welfare of the patient.<sup>4</sup> The objective of this literature review is to impart knowledge to the dental practitioners on the basic concepts of evidence based dental care.

Graduates of dental universities and doctors with a fresh masters degree are up to date with the best practice in dentistry current at the time they graduate. Some of this knowledge gradually becomes out of date as new information and technology appear. It is important, especially with regards to patient safety, for dental practitioners to be able to keep up to date with developments in diagnosis, prevention and treatment of oral disease, and newly discovered causes of disease.<sup>1</sup> There is an overwhelming amount of evidence that comes from research and policy-making organisations, but there is no one organisation that synthesises and assesses all this evidence. Advances in dentistry are usually first reported in dental journals, and in order to keep up with new research, healthcare professionals need to feel confident that they can read and evaluate dental papers. Keeping abreast of new developments through reading current literature can seem onerous and hard to combine with a heavy clinical workload. Fortunately, having an understanding of how to interpret research results, and some practice in reading the literature in a structured way, can turn the dental literature into a useful and comprehensible practice tool.<sup>1</sup>

Consider the following example:

Acute ulcerative gingivitis can be treated with the antibiotic metronidazole. Why is it that not every patient given metronidazole recovers from the disease? Why do some untreated patients recover? Given this, how can we say that metronidazole is an effective treatment?

This example illustrates that people are naturally variable in their responses to exposures or treatments. Different people respond to the same exposure, or same treatment, in different ways.

When examining causes and treatments of disease we always see variation between people in whether they are affected by an exposure or treatment. We need to be able to judge whether any differences observed are due entirely to natural variation or an effect that is above and beyond that of natural variation. For example, if 100 patients with acute ulcerative gingivitis were treated with metronidazole and 95 recovered, would this be sufficient information to say that metronidazole worked? To answer this we would also need to be able to answer the question, 'What recovery rate would we expect if they had not been treated?' Suppose that in a

similar group of untreated patients only 10 recovered. Then the effect of metronidazole above that of natural variation is associated with an extra 85 patients who recover. We may consider this difference to be large enough to allow us to say that metronidazole is effective.<sup>1</sup> Clinical research allows us to have a wider view of the situation and make decisions about causes of and treatments for disease, while allowing for the natural differences between people. Evidence based dentistry is founded on clinical research. The evidence based dental care paradigm implies that clinicians must regularly update their knowledge base by actively and critically digesting new scientific literature.<sup>7</sup> Assessment of scientific evidence consists of three steps: firstly, the retrieval of evidence; secondly, the evaluation of individual studies for the quality of evidence and finally, the synthesis of the combined evidence from multiple studies to make conclusions about the evidence on a particular topic.<sup>6,8</sup> Information can be retrieved by practitioners by accessing computerized bibliographic database such as MEDLINE or PUBMED for references online via the internet. The National Library of Medicine can be accessed for a MEDLINE search at the following website address--<http://www.nlm.nih.gov>. Medical Subject Headings (MESH), text word or authors' names can be used for accessing the references.<sup>6</sup> Clinical practice guidelines and other information on pertinent topics can also be obtained from professional dental societies. After accessing the information, it is evaluated for its quality regarding the type of study group and model with a reference standard, the spectrum of sort of patients in whom the diagnostic test will be applied in practice, use of randomized trials, efficacy of drugs and surgical therapies. Meta-analysis of the evidence gathered is becoming established as the method for summarizing the results of numerous randomized trials and this is used for or against a recommendation.<sup>9</sup> This information now can be used by the practitioners who want to remain abreast of current knowledge and provide evidence based high quality and latest dental care by following clinical practice guidelines.<sup>6,10</sup> Clinical practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care

for specific clinical circumstances.<sup>11</sup> There has developed a need for clinical practice guidelines due to rapid expansion of scientific knowledge, increasing awareness of practice variation and finally expanding commitment to quality improvement. The objectives of clinical practice guidelines are to reduce inappropriate care, improve patient outcomes, reduce health care costs, enhance quality assurance and improve medical education.<sup>6</sup> Evidence from the peer-reviewed literature suggests that the implementation of guidelines can improve the quality of patient care. Further, it must be borne in mind that clinical practice guidelines have a "shelf life" due to constant change in medical knowledge and practice environment. They should therefore be reviewed at regular intervals.<sup>12</sup> High-quality research and well-supported data alone are not sufficient for good decision making. Even in areas where there is a high level of scientific evidence or carefully established guidelines from professional or scientific organizations, there is a startling lack of agreement among providers with respect to clinical decision making.<sup>4</sup> For example, when several providers were asked to make treatment recommendations for the same group of patients, unanimous agreement was found in only 21 (8%) of the 275 diagnosed teeth. At the level of the tooth surface, agreement was even lower and merely reached 0.1% (two out of 2435 tooth surfaces).<sup>4,13</sup> These findings were corroborated by a widely publicized case, where treatment recommendations of various providers given to an individual patient ranged from the restoration of a single tooth to crowning all 28 teeth.<sup>14</sup> Agreement on treatment recommendations appears to be somewhat higher among specialists than among general practitioners, at least in some cases, indicating that graduate education may influence decision making.<sup>4,15</sup> Furthermore, a phenomenon known as physician-induced demand may also play a role in the utilization of dental care (54). This may be exemplified by a case of a patient with four asymptomatic impacted third molars. Of the oral surgeons consulted, all of whom were working under a fee-for-service plan, 80% recommended the removal of all four teeth compared with 45% of general dentists working under a fee-for-service plan, and 27% of general dentists working under a capitation plan.<sup>16</sup> In managed

care, the economic risk is shifted from the third-party payer to the provider, thus giving the provider an incentive to be inactive in case of uncertainty (when in doubt, don't do it). A fee-for-service reimbursement, however, gives providers an incentive to be more active, even when uncertainty prevails (when in doubt, do it).<sup>17</sup> Application of all evidence into practise accumulated from the guidelines can be summarised as GRADE. Grading of Recommendations Assessment, Development and Evaluation (GRADE) is a system for grading the quality of evidence in order to develop recommendations that are as evidence-based as possible.<sup>18</sup> The GRADE methodology consists of the formulation of a clear clinical question which is followed by the identification of all relevant outcomes from systematic reviews, rated depending on how important they are for the development of a recommendation.<sup>19</sup> Judgments about the quality of evidence for important outcomes are made, and specific recommendations are formulated based on the strength of evidence and net benefits.<sup>18</sup> GRADE is not only a rating system. It provides a structured process for developing the strength of recommendations, and its explicit and comprehensive approach ensures the transparency of the judgments made.<sup>20</sup>

## CONCLUSION

Evidence-based care is the prevailing paradigm in the health science. The clinical use of evidence-based medicine has been regarded as one of the most significant medical advancements of the last century. As the costs of medical care escalate, clinical decisions have to be made prudently and with a high degree of efficacy. This can be a very useful tool in translating research findings into clinical practice, thus narrowing the gap between research and clinical dentistry. Dental practitioners have to elicit, sift and decide how to best use information gathered from patients, the literature, colleagues and experts in the field to enhance patient well being.

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