

**EVIDENCE BASED DENTISTRY- A NEW CONCEPT IN DECISION MAKING**

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Abstract

Clinicians must keep up with advances in dental therapies, materials, research, and therapy recommendations in today's society. The dominant paradigm in the health sciences is evidence-based (science-based) care. Dentists must deliver the most effective treatment and employ the most effective disease prevention and diagnosis methods available, all while keeping the budget and their own expertise in mind. Dentists use a variety of tools to make clinical judgements, including their own clinical experience, textbooks, journal articles, and past educational experience. Evidence-based dentistry is a valuable resource for practising modern dentistry and training future dentists. Evidence-based dentistry (EBD) is intended to assist dentists in providing better care to their patients.

Keywords: Evidence-based dentistry, Scientific evidence, Clinical decisions.

Introduction

Two major domains of health care to investigate (EBD) are knowledge or science, as well as the application of this knowledge to various specialties and clinical application to practise evidence-

based dentistry. It connects research to clinical practise by using scientific methodologies to discover the best treatment for a patient's specific clinical situation.¹

The Australian Dental Association (ADA) had also 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, with the dentist’s clinical expertise and the patient's treatment needs and preferences.”²

Evidence-based dentistry aims to eliminate differences in opinion among dentists in terms of diagnosis, prognosis, treatment outcomes, and cost of care for patients with identical conditions, and it is based on *four* factors:³

1. Quality of science underlying clinical evidence
2. Quality in making clinical decisions
3. Variations in the level of clinical skills
4. Large and increasing volume of literature.

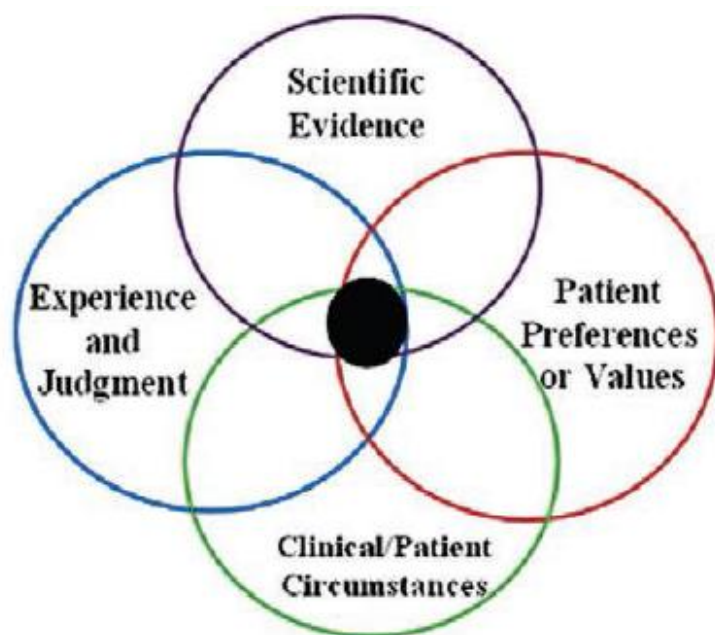


Figure 1. EBD components (Masic I, Miokovic M, Muhamedagic B. Evidence based medicine – new approaches and challenges. *Acta Inform Med.* 2008; 16(4):219–225.⁴

Similar revolutionary advances in dentistry have encouraged it to proceed based on evidence. The evidence for meaningful dental treatment is being strengthened by scientific understanding and clinical observation. The synthesis of the finest available research findings, rather than pieces of selected evidence, is the foundation of effective and sound dental practise.⁵

EBD is a clinical decision-making technique in which doctors make clinical decisions for individual patients based on the most recent data. It necessitates thoughtful decision-making that takes into account not only accessible information but also the features, circumstances, and preferences of the patient. According to scientific evidence, it is the current best technique for giving medicines, with the advantages of being safe, efficient, and cost-effective⁶

Evidence based dental practice provides dentists the chance to apply relevant scientific research findings to the care of their patients, providing quality dental care, clinical expertise, research evidence and patient's preferences with equal importance what actually constitutes evidence based dental practice.

One of the primary purposes of evidence-based dentistry is to guide the selection and implementation of trustworthy data from a wide range of published articles, books, and references. Evidence-based dentistry seeks to eliminate disparities in dentists' diagnosis, prognoses, treatment outcomes, and healthcare expenditures for patients with similar illnesses.^{7,8} Clinicians will eventually adopt more effective treatment modalities and approaches based on evidence, resulting in better outcomes for patients; patients are also easily persuaded by the evidence offered by Clinicians.⁹

Need of Evidence- Based Dentistry

As the amount of available dental research expands, dental practitioners will need to be proficient at dealing with the profession's current needs and demands. Changes in socioeconomic trends, well-informed health-care consumers, rapid technical developments, and the "*information boom*" have raised the pressures on clinical decision-making."³

The need for reliable and up-to-date information to answer frequent healthcare questions is growing. Dentists can employ evidence-based dentistry ideas and procedures to apply relevant research findings to patient care. By providing dentists with useful tools for interpreting and applying research findings, EBD bridges the gap between clinical research and real-world dentistry practises.¹⁰

With the "information explosion" and limited time to keep up with the literature, the evidence-based approach has proven to be advantageous and effective in separating what is truly necessary for clinical decision making from what is not.¹¹ Dentists must be able to stay up with discoveries in the diagnosis, prevention, and treatment of oral illness, as well as newly discovered causes of disease, especially when it comes to patient safety. Dental improvements are often reported first in dental journals, and health-care workers must be competent in their ability to read and understand dental papers in order to stay up to date on new research.¹

Teachers, textbooks, and, in rare cases, journal articles were the principal sources of information at one time, but communication strategies have improved throughout time. Web-based courses and training, as well as computer-based interactive learning, are becoming more popular. Evidence-based dentistry is essential for offering the most effective treatment to individuals in need of dental care.¹²

Searching for the Best Evidence

Evidence is offered from a variety of sources. Keeping up with the most recent innovations in dentistry is a demanding task for any dentist. Each has its own set of benefits and drawbacks. To be evidence-based, clinicians must remember to critically appraise evidence before applying it to patients, regardless of the source.

1. **Colleagues:** This is the most commonly given response, as most healthcare personnel recall learning how to perform specific operations from senior colleagues or a peer who has done so.
2. **Books:** Books are a good source of well-known material that is divided into clearly defined parts and includes a glossary of terms, allowing them to be used as rapid references for basic background information.
3. **Journals:** One way to stay current is to subscribe to a journal.

Electronic searching is an art that may be honed with exercise, but even experienced researchers sometimes overlook significant literature, so a complete understanding of the criteria for good database searching is required.¹² Practitioners can use a computerised

bibliographic database such as MEDLINE, which is available online or on CD-ROM, to hunt up references.

Below are some essential online resources for evidence based research.

PubMed

The National Library of Medicine and the National Institutes of Health (NLM) provide a free medical database called PubMed. PubMed gives you access to MEDLINE, the National Library of Medicine's collection of citations and abstracts in medicine, nursing, dentistry, veterinary medicine, health care systems, and preclinical sciences.

Collaboration Cochrane

The Cochrane Collaboration is an international organisation whose ultimate goal is to create and maintain an electronic database of up-to-date systematic reviews of randomised controlled trials of health care. It has also been called one of the most significant clinical achievements since the establishment of the National Institutes of Health in the United States.¹⁰

METHOD OF PRACTICING EVIDENCE- BASED DENTISTRY

EBD is a method for consciously identifying the best and most up-to-date research for a patient's clinical situation. To provide more effective ways of dealing with clinical issues, the research is coupled with the patients' values, goals, and preferences, as well as the practitioners' own clinical abilities and judgement.

Evidence-based dentistry focuses on acquiring the best information as soon as it is required, examining its quality, and determining its relevance in making clinical decisions in everyday practises.¹³

STEPS IN PRACTISING EVIDENCE BASED DENTISTRY

Define the question

Forming the query will help the searcher focus not only on the literature search but also on the analysis of the material found. The searcher may be interested in the background or the foreground. A disorder, a test, a therapy, a product, and other things are covered. These questions

are usually divided into two portions. They begin with who, what, where, when, why, or how, and are followed by a verb that relates to the topic at hand. Foreground enquiries are more specific and are concerned with the patient's care. These questions usually have *four* parts:

1. The patient problem or population (P)
2. An intervention (I)
3. The comparison (C)
4. An outcome (O), referred to as *PICO*

Interpret the evidence

This takes the most time and, in many situations, is the most difficult element of reading research papers. When evaluating study findings, *three* critical factors must be considered:

- a. The magnitude of a treatment's (or exposure's) effect. Is the effect large enough to be clinically significant?
- b. Are the observed results indicative of a true effect, or are they a result of chance?
- c. The outcomes of research are always dependent on a sample of individuals (or items); would we get comparable results if we took a different sample?

All research studies entail outcome measurement. When deciding whether or not to adopt a new treatment, the effect of the treatment on a certain outcome measure is studied. As a result, we must always assess whether the measure utilised in a particular study is both relevant and acceptable for answering the original question that inspired us to seek information.

Outcomes can be classified as either true or surrogate endpoints. True endpoints have a clear and direct clinical significance to patients. True endpoints in dentistry, for example, are pain, tooth loss, aesthetics, and quality of life in relation to oral health, all of which are palpable to the patient.

Surrogate endpoints are metrics that do not have a clear impact that patients can see. Periodontitis, for example, can be examined in a variety of methods, including evaluating pocket depth or attachment level. In dentistry, the evidence for routine scaling and polishing is an example of how a combination of true and surrogate outcome measures has been utilised to assess whether or not this practise is successful. Plaque, calculus, pocket depth, attachment

change, and bacteriological examinations are easily defined surrogates, but they are only meaningful if they are closely related to patient-relevant outcomes, such as tooth loss or bleeding. These are more therapeutically meaningful outcomes, however evidence on how much they are changed by routine scale and polishing is limited¹

Search for the information ¹⁴

Formulating the question is a key step in searching evidence to inform clinical decisions. There are *three* basic approaches to finding evidence:

1. Identifying keyword and MeSH (Medical Subheading) terms.
2. Looking for secondary sources.
3. Searching for primary sources.

The search terms can be found on the MEDLINE website, under "MeSH" (Medical Sub-Headings). Then the terms of same meaning are combined with "OR" and different categories are combined by using "AND".

Primary research, which includes experimental and observational studies, clinical trials, and surveys, and secondary research, which draws conclusions from primary studies, are the two types of research investigations.

Systematic reviews, meta-analyses, evidence-based practise guidelines, critically appraised subjects, decision analyses/decision tools, and consensus formulation reports are examples of secondary research.

The search should be started by searching pre appraised literature (*secondary research*) before performing database searches for primary literature. These sites offer evidence analysis and grading, perhaps obviating the need for more in-depth research. The following are the most important evidence-based resources:

- ADA database of Systematic Review
(<http://ebd.ada.org/SystematicReviews.org/About.aspx>).
- Journal of Evidence-Based Practice Dentistry.
- The Cochrane Library.
- Evidence-Based Dentistry.

There are various databases that index journals. Most commonly used databases are:

- The Cochrane Database of Systematic Reviews (CDSR) and Database of Abstracts of Reviews of Effects (DARE), found in the Cochrane Library and can be accessed through the Cochrane Collaboration Web site (www.cochrane.org).
- PubMed, which includes MEDLINE (www.ncbi.nih.gov/pubmed).
- CINHAL (www.ebscohost.com/conhal), an acronym for Cumulative Index to Nursing and Allied Health Literature.

Act on the evidence

The knowledge acquired from evaluating the data should next be applied to the query that caused the dentist to do the search.

Levels of Evidence

There are numerous research designs to choose from in health-care research, and diverse study designs are critical to answering certain clinical challenges. The quality of different study designs can be classified into a "*hierarchy*."

Each study design's stance reveals both its strengths and flaws. The strength of the conclusions is demonstrated when the optimal design is applied, demonstrating the "best available evidence" for making a treatment decision.

Understanding the "strength of evidence" is crucial to evidence-based medicine. Clinicians can build a treatment plan using hierarchical research analysis based on the best available information from relevant clinical literature.¹²

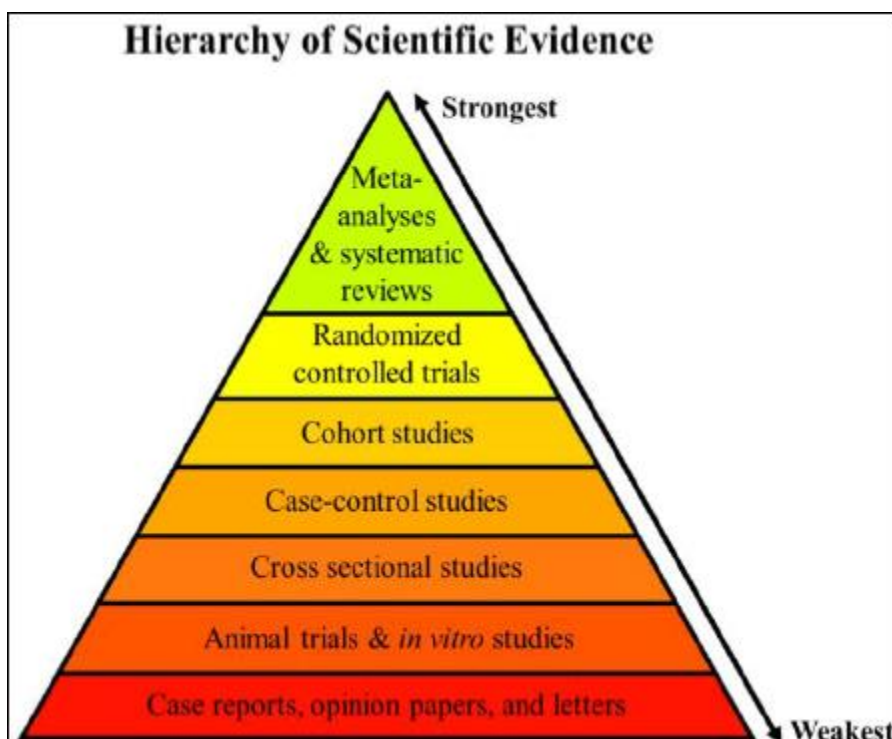


Figure. 2 –Hierarchy of Scientific Evidence.¹

Randomised clinical trials (RCTs) follow systematic reviews and met analyses at the top of the evidence hierarchy, contributing to the greatest degree of evidence. The following steps are non-RCTs, cohort studies, case-control studies, crossover studies, cross-sectional studies, case studies, and expert opinions.¹⁵

Who Benefits From Evidence Based Dentistry

- The eventual beneficiaries of EBD will be the general population, who will benefit from enhanced treatment. The general public, on the other hand, lacks the necessary tools to properly examine the data and must rely on their dentists to assist them differentiate between reality and fiction. Patients will be more informed, more involved in treatment decisions, and more appreciative of high-quality care.
- Researchers who will gain from being trusted to conduct clinical trials prior to the release of new products to the market.

- EBD will also benefit dentists. Instead of performing free product testing for dental product manufacturers, practitioners will be able to make more informed clinical decisions based on more reliable research.¹⁶
- More opportunities to provide carefully selected treatment options that reduce the risk of harm while maximising treatment safety.
- More satisfied patients are the result of customised treatment programmes based on a superb combination of stronger scientific evidence, clinical judgement, and experience, as well as patient preferences and values.
- We were able to cut overhead and increase output while saving time and money by adopting effective and efficient procedures and materials.
- Working with a happier team that is driven by a higher standard that prioritises the patient in the dental care process results in enhanced day-to-day satisfaction.¹⁷

BARRIERS TO IMPLEMENTING EVIDENCE-BASED CLINICAL PRACTISE

The Information Overflow Barrier

One of the most difficult challenges for physicians is keeping up with a continually developing knowledge base. Such a large volume of data would never be considered for examination by a private practitioner. As a result, the vast majority of people rely on systematic reviews. In addition to locating all relevant material in the literature, systematic reviews define the main question, inclusion and exclusion criteria, and search parameters for the literature, as well as assess the study's and information's quality.¹⁸

Patient-Related Barrier

Patient preferences may impede adherence to evidence-based care. The two most important factors influencing patient treatment selections are personal desire and insurance benefits. Because of increased dental advertising and easy access to information via the Internet, today's patients are well-informed clients. Doctors struggle to provide evidence-based care in the face of

increased patient demand, unclear data, and significant financial rewards associated with these services.¹⁸

Factors associated with the practitioner

One important issue is a lack of awareness and familiarity with the evidence. It is apparent that the majority of practitioners do not have access to or are incapable of reviewing primary literature.

Clinicians may continue to practise in the manner in which they were trained during their initial training. Furthermore, many of the procedures and decisions are motivated by monetary reasons. Despite the fact that a more conservative and less profitable treatment is supported by research, clinicians must contend with the impulse to conduct a more profitable procedure. Other constraints include insufficient staff assistance, inadequate reimbursement, rising practice operational expenses, and increased responsibility.¹⁸

Healthcare organization associated barriers

Obstacles associated with healthcare organisations include: Some of the obstacles are intrinsically tied to oral healthcare education and delivery. *First*, while dental students are taught how to discover and interpret scientific data, clinical supervisors may not reinforce this information.

Second, because they are mostly free of peer pressure, solo or small-office dentists are unwilling to change. Dentists are not the only ones that oppose change; modifications in treatments may entail behavioural changes in employees as well.

Third, while most rules are likely to be followed on a regular basis, financial incentives do not stimulate preventative measures.

Fourth, since additional equipment, skills, or training are required, guideline authors may issue recommendations that are not actionable.¹²

Conclusion

As a global movement embracing all disciplines of health sciences, evidence-based care symbolises a shift in practise, with scientific evidence supplanting blind conformity to laws. The

EBD technique allows doctors to query and consider the use of the most up-to-date best evidence in making decisions about individual patients' care. It has various benefits, such as higher treatment standards and results, as well as more efficient and effective healthcare delivery; yet, doctors must overcome some obstacles when adopting research-based evidence in practise, such as finding times, a lack of resources, and a lack of ability. EBD gives greater personal fulfilment for the practitioner in everyday practise because it ensures that the patients' healthcare needs are met by a scientifically verified treatment.

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