# Evidence Based Dentistry: An Approach towards the Latest Paradigm

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***Abstract-*** According to American Dental Association, Evidence-based dentistry (EBD) is 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.

***Index Terms***- Evidence, Evaluation, Medline

## I. INTRODUCTION

Keeping current with advances in dentistry and being able to manage patients who have complex needs and demands is a challenge for practicing dentists. Each day, we are inundated with information about new techniques, tests, procedures, materials or products. Our desire to keep up to date is often tinged with doubt about the claims of superiority of these new treatments or dental products. In addition, despite the increase in skills that comes with experience in clinical practice, there is evidence, at least in medicine, that expertise and effectiveness in some areas which begin to deteriorate the moment physicians leave medical school.[14] Importance of evidence in teaching and support of clinical decisions is well established in health care, including dentistry. Defense of clinical decisions increasingly requires reliable data or evidence to support the stance taken [8]. Nature of the relationship between the patient and clinician is changing. Patients are becoming partners in the decision-making process, not only in the office setting, where decisions are made about their individual care, but also at the policy and funding levels[14]. Patients are starting to come to their dental appointments with information from different sources such as internet or other literature related to it. Every day, consciously and unconsciously, we make decisions regarding our patients' care. To make clinical decisions, almost instinctively we draw on a wealth of resources including our own clinical experiences and discussions with colleagues and also rely on textbooks, journal articles, and previous educational experience. [13]

## II. DEFINITION

According to the ADA Evidence-based dentistry (EBD) is 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. Evidence-based dentistry has also been defined as "The conscientious, expedient and judicious use of current best evidence in making decisions about the care of individual patients [8]"

An evidence-based approach has several advantages such as:-

- It will serve patients better because only tested procedures will be endorsed.
- And secondly it will increase the standing of the profession because it will ensure that proven treatments are offered.

**GOALS** [1, 5]

The goal of evidence-based dentistry is a relevant research which is:-

- High-quality,
- Clinically orientated
- Provides better information for the clinician
- Improved treatment for the patient.

**LEVELS OF USE** [1]

Researchers who utilize EBD concepts to determine proper study design and increase the validity of their work.

1. Teachers who need the depth of knowledge to teach EBD
2. Clinicians who need to critically appraise the literature and apply that knowledge to do best to the patients.

## III. ROLE OF EVIDENCE BASED MEDICINE & DENTISTRY

The term "evidence-based dentistry" has been widely used in recent years, sometimes erroneously. It has been employed to justify a variety of practices, to promote new technologies and products, and to select evidence to support particular viewpoints. However, the definition of evidence-based practice, "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients [8]" suggests that the primary aim and the most valuable application of the evidence-based approach to the practice of dentistry is "to encourage the ordinary dental practitioner in primary dental care to look for and make sense of the evidence available in order to apply it to everyday problems." To do this successfully, many practicing dentists need to acquire certain skills not previously

taught in most undergraduate dental curriculum.[14] Practitioners of EBM require skills not traditionally taught in dental or medical school. The skills include converting clinical problems into answerable questions, learning how to efficiently search the literature and other resources for evidence, critically assessing the evidence to evaluate its validity, and applying the results to clinical practice. EBM in conjunction with experienced clinical skills often makes explicit the expert's implicit clinical reasoning, thereby making it possible for students to substitute mimicry with understanding and avoid the need for years of experience as the only route to good clinical judgment. [3, 13]

**Application of evidence based methods**

Evidence based methods are applied mainly by:-

**A. Starting with a Clear Question**

The first step in the quest for answers to clinical questions is the formulation of a clear and focused question — one that is relevant and will help in carrying out a quick and effective search. Important clinical questions arise from daily encounters with patients in the practice setting.

These questions often relate to therapy like:-

- which is the most reliable technique,
- which material is superior,
- what drug should be prescribed
- Causation - what is the etiology of this condition is this treatment harmful?(7)
- Prognosis - what is this patient's likely clinical course over time,
- What is the expected longevity of this restoration?
- Diagnosis - is this test accurate and reliable?

Focusing the question involves using a framework to identify the patient or population (for example, adults); the problem or condition of interest (smoking, for instance); the exposure to a test, risk factor or intervention (smoking cessation counseling in the dental office); the comparison test or intervention, if any (no counseling); and the specific outcome (quitting smoking).

## IV. FINDING, EVALUATING AND APPLYING THE EVIDENCE

Finding, evaluating and applying the evidence is key to answering a clinical question. It depends upon sources of evidence such s the use of MEDLINE to perform effective searches, the use of the Internet to find evidence , the more commonly used research methodology and the concepts and tools of critical appraisal.

## V. SOURCES OF EVIDENCE

Using an evidence-based approach aids clinicians in selecting the relevant articles, and assists them to efficiently extract and apply the information.[1, 14]

Computerized medical databases, such as Medline, have made it easier to distribute and access information.[6, 8]

***Medline:*** Medline is the standard English-language database for biomedical information. Similar databases are available in several other languages. Medline can be accessed through several gateways:

- Embase (www.embase.com)
- PubMed (www.ncbi.nlm.nih.gov/PubMed/).
- Medscape (www.med-cape.com).
- HealthGate (www.healthgate.com).
- IntelliHealth (www.intellihealth.com),
- MedPortal (www.medportal.com/medlinks.html

*The Cochrane Collaboration:* (www.cochrane.org) and (www.update-software.com/cochrane

***Other sources:*** The following are Internet data sites that are based on evidence-based practice or principles.

- The Centre for Evidence-Based Dentistry (www.ihs.ox.ac.uk/cebd/),
- Bandolier (www.jr2.ox.ac.uk/bandolier),
- ScHaRR (www.shef.ac.uk/~scharr/ir/netting
- DARE (www.agatha.york.ac.uk/welcome.htm).
- *New Zealand Evidence-Based Healthcare Bulletin* (www.nzgg.org.nz/bulletin.cfm).

***Other strategies:*** Other strategies available to aid the dentist with the current available literature are [5]:

- Professional journals, many of which are now available on-line.
- Books, audio and video tapes and CDs.
- Professional and university continuing education meetings/seminars etc.
- Study clubs.

The more effective use of clinical literature and other external data sources to guide patient care. The foundations of EBM lie in clinical research developments over the last 30 years. It is now accepted that virtually no drug can enter clinical practice without its efficacy tested in clinical trials. In addition, randomized trial methods are currently being applied to surgical therapies and diagnostic tests. Furthermore, meta-analyses have gained increasing acceptance for summarizing multiple randomized clinical trials. (13, 14)

Understanding the "strength of evidence" and the idea of a "research design hierarchy" is at the heart of evidence-based dentistry. The "gold standard" has changed from the randomized controlled trial (RCT), to the systematic review of RCTs, as more of these studies are published[12]

Clearly defined study inclusion and exclusion criteria have been adopted [4].

The study-type ranking, from best, is as follows:

1.Systematic review of multiple, multi-centre, prospective, randomized controlled trials.

2.Well-conducted, double-blind, prospective, randomized controlled trials.

3.Well-designed clinical trials, possibly longitudinal, but without randomization.

4. Well-designed clinical trials that are cross-sectional.

5. Matched case-controlled studies.

6. Well-designed experimental studies that do not have controls.

7.Anecdotally-based evidence, which includes descriptive studies and opinion from respected authorities in the field.

8. Individual case studies

**Evaluation of the evidence**

When evaluating a study, or the evidence, a number of questions need to be asked about how the study was performed and its applicability to the clinical situation[12].

These questions include

• How was the study carried out?

• Was there an independent, blind comparison with a control?

• How do the aims and study design contribute to the understanding of a clinical condition or decision?

• Were the methods for performing the test described in sufficient detail to permit replication?

• Are the results likely to be valid?

• What are the results of the study, and will they help provide better treatment of patients?

• Were both statistical and clinical significance considered?

• How does the subject population of the study compare with the patients that make up clinical practice?

• Are the findings applicable, relevant, and feasible in clinical practice?

• What are the risks and will the patients be better off?

In the absence of randomized controlled trials, one is left to seek the next best evidence and to rely on it as much as possible given the weaknesses. This is best done by vigorous examination of the methodology and results. By using a hierarchical analysis of the literature, clinicians can determine a treatment plan based on the best available evidence [8].

## VI. PROBLEMS WITH EVIDENCE-BASED DENTISTRY

The ideal study is the randomized-controlled trial that controls for all possible variables that might alter or affect a given result.[12] The problems which researchers have to face during the study are that consequently, the researchers sometimes have to filter out the various influences that could upset their observations – influences such as patients arriving late, not brushing their teeth regularly, eating the wrong things, falsely reporting they use fluoride toothpaste twice a day, smoking, and a variety of other things . In addition, randomized clinical trials are not foolproof. Other problems exist with finding the most recent evidence: randomised clinical trials are expensive and difficult to run, and publication waiting times are compounded by Medline being 6-8 months behind many journal publications dates [4,14] In addition, few clinical situations in dentistry are life threatening, so the impetus to perform rigorous clinical research to compare efficacy of dental therapies may not seem as important as in medical therapies. [9]

## VII. LEGAL CONSIDERATIONS

Today the society has become more aware about the litigations and legal nuances. If a dentist is sued, what information is required to provide an adequate defense? Is there proper documentation of the examination, diagnosis, and any tests? Does the treatment measure up to the current standards of practice, and is there documentation that those standards have some validity? There are two types of treatment:-

## VIII. THERAPEUTIC AND NON-THERAPEUTIC [1,11]

Therapeutic treatment is defined as treatment that has an established beneficial outcome, whereas non-therapeutic treatment is defined as the use of procedures that have no established beneficial outcome[3]. For non-therapeutic treatment in particular, informed patient consent must be obtained. Informed consent should include details of the treatment and outcomes, all of the risks and benefits, as well as any notes on communications and comments. However, obtaining valid consent means that the dentist must be able to explain the recommended treatment. The use of therapeutic procedures, identified by evidence-based treatment principles, based on informed consent, carried out by skilled and competent professionals, offers a way to minimize claims of medical negligence. But there can be certain problem associated with obtaining consent such as:-

- Lack of relevant knowledge by health professionals.
- How much information to give to the patient in a specific consent
- Ability of the patient to comprehend the information given.

The use of therapeutic procedures, identified by evidence-based treatment principles, based on informed consent, carried out by skilled and competent professionals, offers a way to minimize claims of medical negligence.

## IX. CONCLUSION

The main advantage of evidence based dentistry is that treatment decisions are easier to justify, especially when there is a complaint or dento-legal issues. There is also a personal satisfaction that patients are being offered the best of treatment. There are basically three Components of Evidence Based Dentistry. These are mainly the Evidence, Clinical expertise and Patient preferences & needs. So, it becomes the duty of a practicing dentist to critically evaluate these components before making any decision related to the treatment of the patient.

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