

Evidence Based Periodontal Therapy Bridging Gap Between Aspirations & Reality

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Abstract

Evidenced based periodontal therapy aims to facilitate an approach, accelerating the introduction of the best research into patient care. This approach recognizes that clinicians can never be completely updated with all conditions, medications, materials, or available products. Thus this provides a mechanism for addressing these gaps in knowledge in order to provide the best care possible. This approach provides both clinicians and patients with greater confidence, motivation and trust in their mutual relationship.

This article will review the concepts of evidence based periodontal therapy and , introduces the systematic review as a research tool and examine how evidence based periodontal therapy can both inform and benefit healthcare in periodontal therapy.

Key Words: Evidenced based dentistry, critical appraisal, systematic reviews

Introduction

“It is not enough to do thing right but it is also necessary to do the right thing”-Peter Durker

Clinical decisions in dentistry were previously based on the experience of clinicians like “It works in my hand already & if it has done so, for many years, then just do the same”. Therapies in this fashion were often unpredictable, since the clinician may not know which factors are important for success and which contribute to failure. With the increasing complexity in the practice of Periodontology, keeping current with the advances in periodontics and being able to manage patients who have complex needs & demands is a challenge for Periodontist. Our desire to keep up-to-date with the new techniques, test, materials etc is often tinged with the doubt about claims of superiority of these new treatments or products.

The evidence based approach to periodontal therapy is the “conscientious, explicit & judicious use of current best

evidence in making, decisions about the care of individual patients. It is a process that restructures the way in which we think about clinical problems”. The aim is to facilitate an approach, accelerating the introduction of the best research in the patient care.

Why is Evidence-based Dentistry Required?

The most valuable application of the evidence-based approach to the practice of dentistry is to encourage the dentist to look for and make sense of the evidence available in order to apply it to every day clinical problems. To do this successfully may mean that certain skills need to be acquired. The intention of evidence-based dentistry is to enable high quality, clinically oriented and relevant research, which provides better information for the clinician, improved treatment for the patient, and as a result an increased standing of the profession because only proven treatments will be offered¹.

The Methods of Evedince Based Dentistry

“All improvements require change but not all change is improvement” Which is which? This requires measurement and interpretation. The methods of Evidence based health care provides an efficient method for continuous upgrading and renewing of these skills. As defined by Sackett et al Evidence based health care: ‘It is the conscientious, explicit and judicious use of current best evidence in making decisions about the individual clinical expertise with the best available external clinical evidence’¹.

Evidence based dentistry (EBD) “Is an approach to oral health care that requires the judicious integration of systematic assessment of clinically relevant scientific evidence, relating to patients oral and medical condition and history, with the dentist clinical expertise and patients treatment needs and preferences”². This definition is now incorporated in the ADA Accreditation Standards for Dental Education Programs.

The EBD process must not be used to interfere in the dentist / patient relationship,

nor is to be solely used as a cost effective tool by third party payers.

Evidence based Periodontology-what is It?

“Evidence based Periodontology (EBP) is the application of evidence based health care to Periodontology.”³

Evidence-based Periodontology is a tool to support decision making and integrating the best evidence available with clinical practice Evidence-based Periodontology is not simply systematic reviews of randomized controlled trials. It cannot provide answers if research data do not exist and cannot substitute for highly developed clinical skills.

It can never be a cookbook healthcare or use statistics in isolation to drive clinical care.

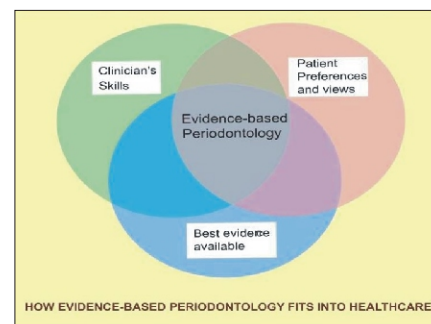


Fig 1: Shows how EBP fits into healthcare.⁴

Historical Perspective

Evidence-based Periodontology is built upon developments in clinical research design throughout the 18th, 19th and 20th centuries. In the year 1992 clinical epidemiological group in McMaster University Canada coined the term Evidence based medicine (EBM)⁵. In 1994, Alexia Antczak Bouckoms in Boston, set up an Oral Health Group as part of the Cochrane Collaboration⁶. The 1996 World Workshop in Periodontology included elements of Evidence based health care. In 2001, the first Cochrane review was published in Periodontology⁷. The 2002 European

Workshop in Periodontology used systematic review to inform consensus. In 2003 AAP uses similar approach as European Workshop in Periodontology. Most recently International Centre for Evidence based oral health (EBOH) was launched in 2003.

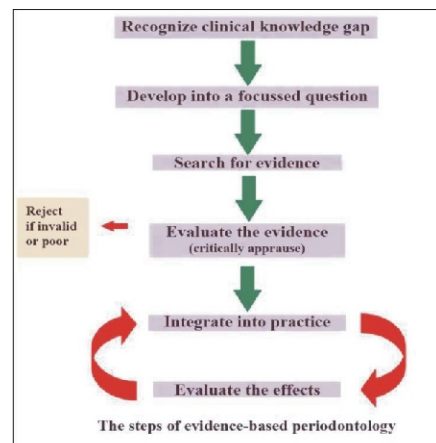
Evidence-based Periodontology V/s. Traditional Periodontology:

Evidence-based Periodontology uses a more transparent approach to acknowledge both the strengths and the limitations of the evidence and also attempts to gather all available data to minimize bias in summarizing the data.

Comparison of evidence-based periodontology vs. Traditional periodontology	
Similarities • High value of clinical skills and experience • Fundamental importance of integrating evidence with patient values	
Evidence-based Periodontology	Traditional Periodontology
Differences	
. Uses best evidence available . Systematic appraisal of quality of evidence . More objective, more transparent and less biased process . Greater acceptance of levels of uncertainty	. Unclear basis of evidence . Unclear or absent appraisal of quality of evidence . More subjective, more opaque and more biased process . Greater tendency to black and white conclusions

Fig 2: Comparison of EBP with Traditional Periodontology⁴.

The Components Of Evidence-based Periodontology (Fig 3)⁵:



Step1: Converting information, needs/problems into clinical questions so that, they can be answered:

Asking the right question is difficult skill to learn yet it is fundamental to evidence based Practice. The process begins with well built question including four parts known as PICO that identify the patient problem or population (P), intervention (I), comparison (C), and outcome(s) (O)⁹. This can be possible using a PICO worksheet (fig 4).

PICO Worksheet and Search Strategy

1. Define your question using PICO by identifying: Problem, Intervention, Comparison Group and Outcomes.
Your question should be used to help establish your search strategy

Patient/Problem: _____
 Intervention: _____
 Comparison: _____

2. Write out your question: _____

3. Type of question/problem: Circle one:
 Therapy/Prevention Diagnosis Etiology Prognosis

4. Type of study (Publication Type) to include in the search: Check all that apply:

Meta-Analysis	Systematic Review	Randomized Controlled Trial
Clinical Trial	Practice Guideline	Review
Cohort Study	Case Control Study	Case series or Case Report
Editorials, Letters, Opinions	Animal Research	In Vitro/Lab Research

5. List main topics and alternate terms from your PICO question that can be used for your search:

List your inclusion criteria-gender, List irrelevant terms that you may age, year of publication, language. Want to exclude in your search:

List where you plan to search, i.e. EBM Reviews, MEDLINE, AIDSLINE, CINAHL, PubMed:

Table 1. Presents an examples of questions for different problems using an application of PICO process.¹⁰

Type of question	Patient or problem	Intervention (treatment, test, prognostic factor, class, etc.)	Comparison (if any)	Outcome(s)
Therapy	"For children with posterior crossbite in the primary dentition..."	"...will occlusal grinding to remove premature contacts..."	"...when compared to no intervention..."	"...prevent posterior crossbite in the permanent dentition?"
Diagnostic	"In patients with undiagnosed oral lesions..."	"...can a toluidine blue mouth rinse..."	"...when compared to an oral biopsy..."	"...effectively detect oral cancer and precancer?"
Prognosis	"For patients with osseointegrated implants..."	"...who smoke..."	"...compared to patients who do not smoke..."	"...what is the proportion of implants lost at 10 years?"
Caution	"For my pregnant dental assistant..."	"...exposed regularly to the use of nitrous oxide for patient sedation..."		"...what is the risk of harm to her unborn baby?"

Step 2: Conducting a computerized search with maximum efficiency for finding the best external evidence with which to answer the question

There are two types of evidence:

1. Primary- Original research publications
2. Secondary- Synthesized publications of the primary literature, usually on specific topics or articles. Like the systematic reviews and article reviews and evidence based journals.

{e.g., Journal of Evidence-Based Dental Practice [http:// www.us.elsevierhealth. com/JEBDP/](http://www.us.elsevierhealth.com/JEBDP/) and Evidence-Based Dentistry <http://www.naturesj.com/ebd>}.

How to and where to search?

This can be done using online access to medical databases, such as Medline and various evidence based groups¹¹.

Table2. Examples of various evidence based groups:

The other strategies available are hand searching various journals, books, professional universities continuing dental education programme.

EVIDENCE BASED SOURCES OF EVIDENCE	
PubMed- Free public version of Medline	http://pubmed.gov
SUMSearch is a "meta-search" engine for evidence-based medicine resources.	http://SUMSearch.uthscsa.edu University of Texas Health Science Center at San Antonio
COCHRANE COLLABORATION	http://www.cochrane.de/
COCHRANE Oral Health Group Abstracts of Systematic Reviews	http://www.cochrane-oral.man.ac.uk/abstracts.htm
DARE [Database of Abstracts of Reviews of Effectiveness]	http://hsrcrd.york.ac.uk/darehp.htm
DARE listing of Dental systematic reviews	http://www.cochraneoral.man.ac.uk/dental_systematic_reviews.htm
Bandolier - Dental and Oral Health	http://www.jr2.ox.ac.uk/bandolier/booth-/booth/dental.html
Evidence-based Dentistry Journal	http://www.naturesj.com/ebd
Journal of Evidence-based Dentistry	http://www.us.elsevierhealth.com/JEBDP/
ADA Guidelines	http://www.ada.org/prof/practissues/statements/index.html
ADA National Guideline Clearinghouse	http://www.guideline.gov

Levels of Evidence

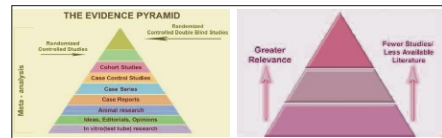


Fig 4 & 5: Shows the hierarchy of evidence & Levels of relevance¹⁰.

The hierarchy of evidence is based on the notion of causation and the need to control bias.¹² Systematic reviews and meta-analysis using two or more randomized controlled trials of human subjects are considered to present the highest level of evidence or the gold standard in medicine^{13, 14}. These are followed respectively by randomized controlled studies, cohort studies, case-control studies, to studies not involving human subjects.¹² Although each level may contribute to the total body of knowledge, "...not all levels are equally useful for making patient care decisions."¹⁵

Step 3. Critically appraise the evidence for its validity and usefulness.

Once the current evidence is found, the next step is to understand is relevance to the patient and PICO questions.

- Critical appraisal asks three questions:
1. Are the results of the clinical trials valid?
 2. Are the valid results important?
 3. Can these valid and important results be applied to my patient?

The first question focuses the analysis on research design, methods and manners in which the study was conducted. The validity of the published evidence is affected by quality of every stage of experimental process.

Most methodological errors are either:

1. Bias
2. Confounding
3. Chance

Bias

Bias is a systematic error. Bias leads to incorrect estimate of effect of risk factor on the development of a disease.

Type of bias:

- How subjects were selected for inclusion in a study (selection bias)
- Provision of care (performance bias)
- Assessment of outcomes (detection/measurement bias)
- Occurrence and handling of patient attrition (attrition bias)

Randomized controlled trials are less likely to be affected by selection bias if the randomization is properly conducted.

Confounding

Confounding is a situation where the estimate of the association between an exposure and disease is mixed up with the real effect of another exposure on the same disease, the two exposures being correlated¹⁶.

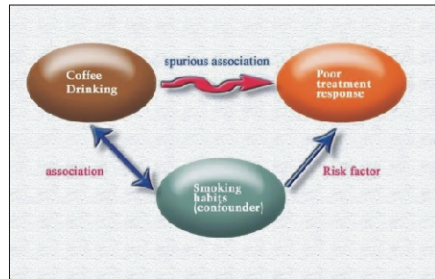


Fig 6: Shows an example of confounding

Chance

Chance (sampling error) plays a role in most studies of human, since it is rarely possible to include the entire population in an investigation.

The second question addresses the size of the affect, while the third engages the patient in determining whether the size of the affect meets the patient needs.

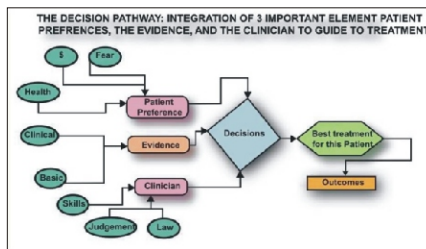
Step 4: Applying the results of critical appraisal in clinical practice.

This can be done by answering for the following questions

- Is the intervention appropriate for the patient?
- Is the intervention consistent with patient circumstances & attitudes?
- Are the costs, financial & clinical, acceptable to patient & clinician?

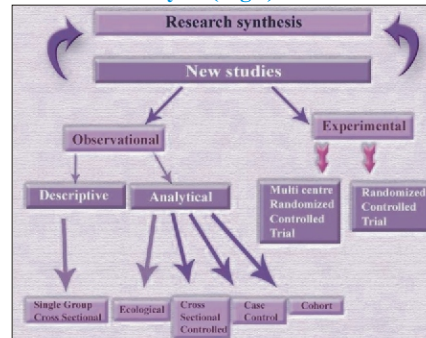
Step 5: Evaluating the process & self performance.

The Decision Pathway (Fig 7):



This is an integration of three important elements the patient preferences, the evidence and the clinician to guide the treatment

The Evidence Cycle (Fig 8)¹⁷:



The above framework emphasis on patient centred decision, makes it important that the research design be clear on the difference between effect, efficacy, effectiveness and efficiency. The four important E's in evidence based Periodontology. Each of the 4 E's play's an important role in generation interpretation and application of the evidence.

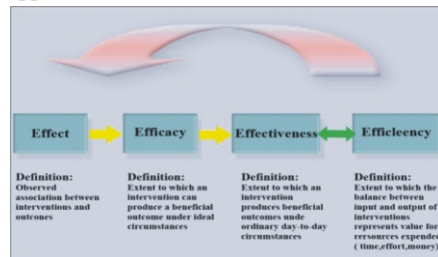


Fig 9: The '4 important E's'.

Table 3: Merits And Demerits of Evidence Based Approach To Dental Practice¹⁹:

MERITS	DEMERITS
Incorporate clinical expertise with the best available scientific evidence to provide highest level of patient care	Evidence based approach is slow. It is not possible to wait for systematic review to be published & then only provide necessary treatment
It improves the effective use of research evidence in clinical practice	Amount of evidence available currently in Periodontology is large & not all are related to the field
It is more objective and patient focus.	EBD is hard, it requires effort, as it makes you question. You have to think about what you doing and then ask for information.
It uses transparent methodology & uses resources more effectively.	Technical terms are poorly understood by most dentists and some are not computer savvy
Scientifically sound: It relies on evidence rather than authority for clinical decision making.	Quality of evidence is affected, as most of the published scientific paper, are affected by sponsors, leading to publishing of positive results and ignoring negative trials.
Monitor and develop clinical performance	Dissemination of the evidence: Unless good method of dissemination is available, even when there is good evidence, it can take many years to become a norm.
It is thorough & comprehensive & stress good judgement	EBD may not provide answers applicable to patient & must be compared with clinical expertise related to patient assessment, characteristics & performance.

Conclusion

“Good decision improves the chances of good outcomes”. Thus assessing new evidence on a frequent and regular basis adds to our knowledge and improves the efficiency of care we deliver. Systematic reviews can offer credible, unbiased information and help keep up with the science.

Evidence based approach is a tool to be used by clinician together with clinical experience, judgment, and the preferences of the patient.

The evidence based periodontal approach empowers the clinician by facilitating informed decision-making based on the fact, not opinion. Most important, it allows us to care for our patients.

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DURA LC PLUS: Features include: Control Unit, Powerful Air LED, Digital display for speed, 100% energy 1000W/200W, Auto stop: 420m-480m, Long time: 15m-30m, 4 way or automatic, 1 year warranty, 360° rotatable light guide.
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