

Review**Evidence based dentistry: An introduction****Jyothi Latha Ballal, Preeti Adusumilli***Department of Public Health Dentistry, SRM Dental College & Hospitals, Ramapuram, Chennai***Address for correspondence****Dr. Jyothi Latha Ballal**Department of Public Health Dentistry
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Tamilnadu, India**Abstract**

Historically and even today in most of our clinical practice and in hospitals our treatment protocol towards the patient is mostly decided based on our clinical experience and academic expertise or what was taught to us by our professors. But this is definitely true that dentistry is growing rapidly in all directions and most of us still follow outdated techniques and technologies. The main role of evidence based dentistry is thus to bridge this gap between research and dental practice.

Keywords: Evidence, Dentistry, Randomized control trials, Cochrane collaborations

Introduction

“We live in an age of information, innovation and change”, where clinical decision making must be based on good quality evidence and should lead to more effective and efficient treatments.

Each day, consciously and unconsciously we make the decisions regarding our patient's care. To make clinical decisions, almost instinctively, we rely on a wealth of resources including our own clinical experiences, discussion with colleagues; on text books, journal articles and previous educational experiences. As practitioners, thinking critically about how we make clinical decisions is important. As educators, we should evaluate how to teach students to make clinical decisions. To make clinical decisions, and to practice modern dentistry and to educate the dental care professionals, the evidence-based dentistry forms an important asset.

Evidence: The emerging phase¹

Dentistry, as a profession, has developed a store of specialized knowledge that serves as the basis for professional decision making. This knowledge base has evolved through 3 phases and currently may be entering a fourth phase, *the phase of evidence based dentistry*.

Why is evidence-based dentistry required?

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 offered².

Evidence based dentistry:

- Is scientifically sound
- Is objective
- Is patient focused
- Incorporates clinical experience
- Is thorough and comprehensive
- Uses transparent methodology

Phases of evidence based dentistry³

- 1) Asking evidence-based questions (framing an answerable question from a clinical problem)
- 2) Searching for the best evidence
- 3) Reviewing and critically appraising the evidence
- 4) Applying this information in a way to best help clinical practice

1. Framing the question for a clinical problem

This is the first step in evidence based dentistry which allows us to determine the type of evidence and information required to solve the problem and the outcome measures that will be used to determine the effectiveness of the intervention.

The PICO⁴ process

The formality of using PICO to frame the question forces the questioner to focus on what the patient/client believes is the most important problem and the desired outcome. Doing this

facilitates selecting language or key terms for conducting the computerized search. Next, it allows you to determine the type of evidence and information required to solve the problem and the outcome measures that will be used to determine the effectiveness of the intervention.

One of the greatest difficulties in developing each aspect of the PICO question is providing an adequate amount of information without being too detailed.

Structuring the PICO process

After understanding the elements of PICO and identifying the patient's concerns, you are now ready to structure the PICO question.

P = Patient Problem or Population

The first part of the PICO question begins with the following phrase: it describing either the patient's chief complaint or by generalizing the patient's condition to a larger population.

The problem is further shaped or refined by the most important characteristics that might influence the results such as

- Disease or health status
- Age, race, gender, previous conditions, past and current medications

I = Intervention

It is important to identify what you plan to do for that patient. This may include the use of a specific diagnostic test, treatment, adjunctive therapy, medication, or the recommendation to the patient to use a product or procedure. The intervention is the main consideration for that patient.

C = Comparison

It should be specific and limited to one alternative choice in order to facilitate an effective computerized search. The Comparison is the only optional component in the PICO question since oftentimes there may not be an alternative.

O = Outcome(s)

This specifies the result(s) of what you plan to accomplish, improve, or affect, and it should be measurable. Outcomes may consist of relieving or eliminating specific symptoms, improving or maintaining function, or enhancing esthetics.

2. Searching for the best evidence⁵

Using an evidence-based approach will help clinicians who want to stay abreast of changes in their areas of health care by

assisting them with the selection of relevant articles, and will aid them to efficiently extract and apply the information. Computerized medical databases, such as Medline, have made it easier to distribute and access information.

Where is the evidence found?

- 1) Medline
- 2) The Cochrane Collaboration
- 3) Other sources
 - a. Professional journals
 - b. Web-based continuing education programmes
 - c. Books, audios, and video tapes
 - d. University continuing education meetings
 - e. Study clubs

Guide to the evidence

The best sites that were found are those produced by academic centers, including university and hospital sites, government-sponsored and professional organization sites and the sites of several medical search engines.

Academic centers

The following list is by no means comprehensive, but represents some of the sites that were found most useful

- 1) The Centre for Evidence-Based Dentistry (www.ihs.ox.ac.uk/cebd/) is located at the Institute of Health Sciences, Oxford University, United Kingdom.
- 2) The School of Health and Related Research (SchHARR) at the University of Sheffield in the United Kingdom has a comprehensive document entitled getting the evidence.
- 3) The library of the Ottawa General Hospital (www.ottawahospital.on.ca/professionals/library) provides a large collection of links to resources for evidence-based health care.
- 4) The University of Toronto Centre (www.library.utoronto.ca/medicine/ebm/) is based at Mount Sinai Hospital part of the University Health Network.
- 5) The Canadian Centers for Health Evidence (<http://www.cche.net/>) is a project based out of hospitals in Alberta and Winnipeg but having numerous other partners.

Government sponsored and professional sites

The best known sites in this category are

- 1) National Institutes of Health (NIH) National Library of Medicine databases, particularly MEDLINE (<http://www.ncbi.nlm.nih.gov/>)

- 2) NLM Gateway (<http://gateway.nlm.nih.gov/>)
- 3) A very useful site is MedFetch: Automated Medline Queries, (<http://www.medfetch.com/>)

Evidence based guidelines

- 1) National Guideline Clearinghouse (NGC) (www.ahcpr.gov/clinic/cpgsix.htm) of the U.S.
- 2) The Scottish Intercollegiate Guidelines Network (www.show.scot.nhs.uk/sign/).
- 3) The Canadian Medical Association clinical practice guidelines site (www.cma.ca/cpgs/) provides methodological guidance for the development of guidelines, as well as a handbook on the implementation of guidelines.
- 4) The German Guidelines Information Service (www.leitlinien.de/gergis.htm) has evaluation criteria, as well as an appraisal instrument to evaluate the methodological quality of published guidelines.

Medical search engines

Two particularly good sites are Clini Web International and Medical Matrix.

3. Reviewing and critically appraising the evidence⁶

The culture and concept of "critical appraisal" has largely grown out of the evidence-based health care movement. It fits into the cycle of "getting evidence into practice." In theory, this means improving the quality and cost effectiveness of health care by finding the best available research evidence on the outcomes of health care interventions, and basing decisions on health care upon it. In practice this translates as, first of all, "finding the evidence" (doing a literature search in the most appropriate databases), then carefully checking the validity of the research ("critical appraisal"), before applying the lessons learnt from the evidence in the care of patients.

Role of Cochrane collaboration

The Cochrane Collaboration is an international not-for-profit and independent organization, dedicated to making up-to-date, accurate information about the effects of healthcare readily available worldwide. It produces and disseminates systematic reviews of healthcare interventions and promotes the search for evidence in the form of clinical trials and other studies of interventions. The Cochrane Collaboration was founded in 1993 and named after the British epidemiologist, Archie Cochrane.

The major product of the Collaboration is the Cochrane Database of Systematic Reviews which is published quarterly

as part of *The Cochrane Library*.

Those who prepare the reviews are mostly healthcare professionals who volunteer to work in one of the many Cochrane review groups with editorial teams overseeing the preparation and maintenance of the reviews, as well as application of the rigorous quality standards for which Cochrane Reviews have become known.

Table 1: Levels of evidence⁷

Level	Type of evidence
1a	Systematic review of randomized controlled trials (RCT)
1b	Individual RCT
2a	Systematic review (with homogeneity) of cohort studies
2b	Individual cohort study
2c	Outcomes research; Ecological studies
3a	Systematic review of case-control studies
3b	Individual case-control study
4	Case-series (and poor quality cohort and case-control studies)
5	Expert opinion without explicit critical appraisal, or based on physiology, bench research or first principles

The Cochrane Collaboration has a special organizational structure to meet the needs of producing high quality information Cochrane review groups produce Cochrane Reviews in specific medical topic areas.

The organizational entities are as follows

- The steering group sets policy for the organization, using input from its subgroups
- The secretariat administers policy for the steering group, its sub and advisory groups, and also handles all administration relevant to the running of these groups
- Method groups provide advice and support to the collaboration in the development of the methods of systematic review
- Networks identify health issues of importance to specific populations and/or intervention types, and facilitate

reviews across the relevant review groups

- The consumer network work to ensure that the perspective and needs of consumers are incorporated into cocharane systematic reviews
- The ombudsmen and publication arbiters help to reach agreement and resolve areas of conflict
- The funding arbiter helps resolve questions relevant to the funding of Cochrane entities or reviews.

3. Applying this information in a way to best help clinical practice¹⁰

After these reviews the best evidence for the particular patient is selected and applied, which completes the process of evidence based dentistry.

Conclusion

Traditionally, most clinical decisions in dentistry have been based on the experience of the clinician. If a treatment seems to work, it is administered again; if the results are disappointing, the procedure may be abandoned. Therapies tested in this fashion are often unpredictable because the clinician may not know which factors are important for success and which factors contribute to failure. The evidence-based approach strives to strengthen clinical experience through the systematic evaluation of available information, which allows the clinician and patient to benefit from the amassed data. The nature of the relationship between the patient and the 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, where consumer input is increasingly valued. Patients are starting to come to their dental appointments with information downloaded from the Internet, some of which may be unfamiliar to the dentist.

Thankfully, a number of forces are coming together to propel the evidence-based paradigm into everyday dental practice.

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