by Stanley Ayers, DDS

How Dental Treatment Keeps Pace with Current Research

Your clients' dental plan can have an important, positive influence on how its participating dentists make treatment decisions. By offering front-line information and sources of new research, the dental plan can help its dentists balance the most up-to-date research with patient considerations when recommending treatment.

For dental plans, evidence-based dentistry offers an opportunity to create more value for its members by emphasizing proven treatments, rather than following popular trends. For example, one trend is for plans to cover third and fourth cleanings. However, best evidence shows that the bacteria in your mouth returns to the same level within a matter of a couple days, so these extra cleanings are unnecessary, barring any periodontal symptoms. The dental plan can offer tools to help identify increased susceptibility to cavities through a simple screening such as the one offered by CariFree. Far more effective in preventing cavities is controlling the pH and bacteria level in the mouth.

Working up to Evidence-Based Dentistry

Dental treatment is advancing at a rapid pace. Not long ago, there were no x-rays, no method for preventive care or oral hygiene, and no knowledge of microbiology to know anything about the causes of cavities or tooth pain. The first metal amalgam fillings had to be 200 degrees Fahrenheit before they could be poured on the exposed nerve. Pain management is a relatively recent development as well, so you can imagine what boiling metal on an exposed nerve with no medication might feel like.

Evidence-based dentistry helps dentists recognize developments in the field to bring the latest in dental treatment from the research labs to the dental chair. It is a recent practice that helps dentists take a broad-based view when planning and recommending patient treatment. It was first introduced in the 1990s by Gordon Guyatt through the Evidence-Based Medicine Working Group.

The American Dental Association (ADA) defines 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."

In other words, evidence-based dentistry is an approach to dental treatment that combines research with the dentist's skills and the patient's needs and desires and centers on a question of whether a particular treatment is the best option for a specific patient.

One thing to keep in mind is that the practice of evidence-based dentistry often leaves room for interpretation. Part of the challenge for the dentist is to make sure the quality of the research they are taking into account is sound. It's important to see how a study was funded and reviewed to help judge whether a recommendation is well founded and what biases could be contained in the outcome.

Where to Start?

The first thing a dentist needs is a question such as, "Should I encourage my patients to chew gum sweetened with xylitol?" From there, a dentist naturally needs evidence to support or refute the question he or she is trying to answer. Good sources for research conclusions include peer-reviewed journals, large scale research studies, and some scientific journals focused

specifically on evidence-based dentistry. *Evidence-Based Dentistry* from Nature Publishing Group and the quarterly publication, *Journal of Evidence-Based Dental Practice* are great examples. The most "widely" used free database is called Medline and is an excellent resource to access and research best current evidence for a question. One of the most respected sources for current information is the Oral Health Group with the Cochrane Collaboration. It is an international network of people who prepare, disseminate and sort the randomized controlled trials in oral health to help practitioners keep current.

Evidence-based dentistry has guidelines for how to qualify research for how much stock to put into a particular study. "Best evidence" refers to information gained from studies and trials and is given a strength depending on the objectivity of the study and how conclusive the findings are. Some of the best kinds of evidence are randomized controlled clinical trials, non-randomized controlled clinical trials, cohort studies, case-control studies, cohort studies and crossover studies.

These can all supply strong evidence to help provide a convincing answer to a dentist with a treatment question. These can be split generally into "interventional" and "observational" evidence.

Interventional is when a study was conducted as an intentional experience; and observational takes data and draws conclusions from it.

A randomized, systematic controlled trial is a strong method for gaining unbiased conclusions. This is a clinical trial in which participants are assigned at random to either an experimental or control group. Outcomes are found through follow-up, and this creates a very neutral, objective study.

What Isn't Evidence?

It's important to be aware of what cannot be considered good evidence as well as what can. A case report is an example of poor evidence, as it shows the treatment plan for an individual patient. Good evidence should be based on a study with a larger sample size.

Another example of bad evidence is epidemiology, or the study of health patterns in society. It is an interesting topic, but in the arena of evidence-based dentistry, it provides only corollary evidence, where the dentist should be looking for causative evidence. A final example of bad evidence is animal testing. Ethical convictions aside, animal testing has no bearing on what will happen in circumstances involving a human and should not be leaned on for clinical or treatment decisions.

How Do You Identify Bias?

Bias can be as subtle as the wording of a survey question, or as overt as a company with an obvious incentive to make sure that findings point in a certain direction.

There are two types of bias relevant to evidence-based dentistry. One is selection bias, which is a problem with the sample of the group being studied. This can be a non-representative sample of the population or a sample that isn't large enough from which to draw a meaningful conclusion. Selection bias happens when there is an outcome distortion because of the method of sampling.

The other bias is measurement bias. Measurement bias refers to a problem with measuring the data incorrectly. This can be with an incorrect baseline or data measured with equipment that isn't calibrated properly. As bias can skew research results, it must be considered as a factor when evaluating evidence.

How do you Find Good Evidence?

In order to find good evidence, there are practices to help dentists qualify research. Before beginning research though, it's important to have a well-defined clinical question. One useful tool for defining the question is called Population, Intervention, Comparison and Outcome (PICO). Population is the answer to the question, "Who was surveyed?" It should include some geographic and demographic information to help define the study. Intervention is what treatment or exposure was administered to the experimental group; comparison is about what happened between the control group and the experimental group; and the outcome is the difference between those two groups.

Evidence-based guidelines help define evidence-based medicine on a macro level. Included in this approach are guidelines, protocol, standards and parameters of care. This lays framework for ensuring the soundness of evidence analysis.

Applying Evidence-Based Dentistry

Dentistry technology and research is moving at an accelerating pace. Evidence-based dentistry is a proven technique for applying sound research in the dental office and from a plan design standpoint for dental plans to deliver more efficiency. From teeth being grown in a laboratory and repairing cavities by restoring tooth enamel, the available tools are improving to the point where there will be several options available for someone with a cavity including reversing early tooth decay. The dentist drill may be obsolete in the not too distant future. Just be glad your dentist has proper training, can recommend some preventive treatments and if need be can administer an anesthetic if you need to have some treatment done in the meantime. ❑

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