Course Description:

In an evidence-based world 2 + 2 equals 4, not 5 or 3. However, assessing medical or dental evidence is more challenging than checking a simple addition. How should one judge a claim that a cast gold restoration is ideal because of its high corrosion resistance and malleability, versus the clinical trial evidence that ten percent may fail within two years? In 1992, the term evidence-based was introduced into mainstream clinical literature. Today, governments, insurance companies, dental schools, dental professional organizations, and dental businesses have all laid claim to the term evidence-based dentistry. This course will address some elements of an evidence-approach to diagnosis, etiology, and treatment of dental diseases.

Course Outline:

Framing the Question “A great deal of influence rests in the hands of parties who control the framing of a health issue” K.D. Brownell and K.E. Wagner, 2009

Clinical practice revolves around questions on diagnosis, etiology, treatment, and prognosis. How can one reliably diagnose a root fracture? Are dental diseases infectious diseases? Does a biopsy of a leukoplakia increase cancer risk? What is the prognosis of an individual with advanced periodontitis? As a clinician, it is intuitive and natural to think about these questions in such vague and non-specific terms. However, a search for answers should not occur without turning the vague question into a specific and clinically-relevant question. This apparent simple step—from vague to specific—is challenging, time-consuming, and often a frustrating experience. It is nonetheless a critical step. Without this critical step of framing the question into an answerable scientific question one is at the mercy of those individuals, organizations or businesses who will frame questions for you and who could trick you into trusting evidence-based answers to questions that you think corresponds to your vague question, but yet answer a question that is fundamentally different from what you had in mind.

Grading the Answer to the Question: The evidence

There are thousands of publications suggesting that hormone replacement therapy provides health benefits. Yet, one well-conducted randomized trials led to the opposite conclusion. What to belief? Should one belief the “totality of the evidence” or just the one study? One principle in evidence-based decision making is that all evidence is not created equal. Some evidence is more reliable than other; one study can trump a totality of evidence.
Diagnosis and Screening

Beliefs on what causes an orofacial pain in a particular patient can change swiftly as radiographic, clinical, and anamnestic information becomes available. The process of diagnosis illustrates that clinical actions—whether it be diagnosis or any other type of clinical decision—are based on beliefs or probabilities that can change as new evidence becomes available.

Four topics in diagnosis
- Snails versus evangelists
- Are more diagnostic tools better?
- False positives
- Guidelines in assessing the value of a diagnostic test

Weighing in with your expertise on opposing viewpoints in diagnosis:
- The need for oral cancer screening:
  - Neutral: “The U.S. Preventive Services Task Force (USPSTF) concludes that the evidence is insufficient to recommend for or against routinely screening adults for oral cancer”
  - In favor: “Routine, careful examination of patients (for oral cancer) is appropriate and necessary.” American Dental Association

Etiology and harm

The human brain is notoriously unreliable and biased when it comes to assessing causality. Even the temporality of events—a sacred property of causality—is often poorly recalled. More worrisome, beliefs on causality—once formed—are sticky, resistant to change. Even overwhelming information (in the form of scientific evidence) can fail to change beliefs.

Four topics in etiology
- The power of (biological) plausibility
- The limitations of epidemiology
- Epidemiology of dental caries and heart disease; how it differs and why it matters?
- The dangers of selective refutation

Weighing in with your expertise on opposing viewpoints in etiology:
- Dental diseases as infectious diseases
  - In favor: NIDCR described dental caries and periodontal disease as infectious diseases
  - Against: Epidemiological evidence may be more consistent with the hypothesis that dental diseases are lifestyle diseases, not infectious diseases
Treatment

Properly designed randomized controlled trials can provide unequivocal evidence answers to a very specific clinical question. Evidence-based resources can further help translate these clinical trial findings into action. The success of the 100,000 lives campaign – a program designed to drastically reduce hospital mortality by means of simple proven treatments – demonstrated the power of an evidence-based approach. Nonetheless, the process of clinical trials can be severely corrupted and mislead clinical practice.

Four topics in treatment
- Recognizing trials designed by marketing departments and business investors
- A dental curriculum paid for by industry?
- Hidden evidence
- Surrogates

Weighing in with your expertise on opposing viewpoints in treatment:
- Floss your Teeth
  - In favor: Two clinical trials on professional flossing in non-fluoridated areas in predominantly primary teeth showed a reduced caries risk
  - Against: Three systematic reviews have identified an absence of randomized trial evidence that self-flossing reduces caries, gingivitis, or periodontitis.

Some simple tools for implementing EBD in clinical practice

Implementing Evidence-Based Dentistry into clinical practice can be challenging. PICO, prescription slips, and Pubmed may offer some help in this respect.

- The prescription slip: In a rationale world, it is assumed that any clinical action or recommendation is associated with evidence. This reliability of this evidence may range anywhere between biological plausibility and randomized controlled trial evidence. An evidence-based practice is one where there is a conscious assessment of the level of available evidence in support of a clinical decision.
- Pubmed: The number of websites providing dental and medical evidence is increasing rapidly. Often, it is difficult to determine who provides the financial backing for the construction of these websites as companies will often use non-profit organizations to market their wares. In this challenging world of evidence, Pubmed remains a stalwart source of evidence.
Resources

On the web

- Cochrane Library (http://www.cochrane.org/) systemic reviews of randomized controlled trials on dental interventions
- TRIP Database (http://www.tripdatabase.com/index.html) – includes oral health section
- DARE (http://www.crd.york.ac.uk/crdweb/) Database of Abstracts of Reviews of Effectiveness
- National Guideline Clearinghouse (http://www.guideline.gov/)

Books

- Evidence Based Medicine (3rd Edition) (Turtleback) by Sharon E. Straus, W. Scott Richardson, Paul Glasziou, R. Brian Haynes
- The Truth About the Drug Companies: How They Deceive Us and What to Do About It. Marcia Angell
- Charlatan: America's Most Dangerous Huckster, the Man Who Pursued Him, and the Age of Flimflam. Pope Brock.

Educational Goals/Objectives:

To provide participants with the ability to independently assess the scientific evidence of reports, introduce the fundamentals of epidemiology, and make evidence-based decisions on diagnosis, etiology, treatment, and prognosis