

Evidence-Based Practice

My car manual recommends changing the oil after 6 months or 6000 miles of normal driving. Yet the service station attendant suggests that the old rule of changing oil every 3000 miles is better for the engine. "Based on what evidence?" I ask. Is the attendant self-serving, biased by previous practice, or unfamiliar with proper protocol?

In the health sciences, there is a new approach to asking questions. Whether to contain cost, prevent harm, or find more effective therapies, evidence for pursuing a particular approach is being questioned. Should chest radiographs be used as routine screening for tuberculosis? At what age should mammography screening be standard practice? Is there long-term benefit of chiropractic treatment for back pain? Should changes in diet be used to manage cancer? Do nutraceuticals eliminate arthritic pain? These questions are asked in search of evidence to support a particular therapy. It is not that such questions have not been asked before; rather the approach in seeking answers to those questions is changing, in that evidence from randomized, systematic, controlled study is now required to justify a particular assertion.

In dentistry, similar questions are being asked. Should a rubber cup prophylaxis be performed every 6 months? Is there benefit from routine radiographs exposed at regular intervals? Should in-office applications of topical fluoride be used routinely in a fluoridated area? Should "sticky" pits and fissures be restored? Should amalgam restorations with small marginal defects be replaced? Is there long-term benefit from early orthodontic treatment or treatment for temporomandibular pain?

Questions are now being asked in dentistry to establish evidence as the basis for treatment. Is a given procedure effective, or are there more effective alternative strategies? Is the procedure even necessary, or worse yet, potentially harmful? In some cases those questions regarding effectiveness, alternative strategies, necessity, and safety remain unanswered. In other instances, the answers exist, but practitioners are ignorant of the answers. In still other instances, the answers exist and practitioners are aware of the answers, yet procedures still are not based on objective knowledge. For example, after more than two decades of demonstrated value, fissure sealants

are not widely used by general practitioners. In another example, pediatric dentists are applying topical fluoride for less than the optimal 4-minute interval despite a lack of clinical data substantiating the effectiveness of a reduced application time (Warren, et al. in this issue).

As practitioners, we should ask "Based on what evidence?" Are practitioners self-serving? Are they trapped by their previous practice, or unfamiliar with the evidence for new protocols? At the cutting edge of health care education is the idea of evidence-based practice. Born in the early 1980s and nurtured in the early 1990s, this approach now frequently appears in the medical literature as an alternative to traditional approaches.

In traditional education, knowledge was transmitted by a teacher considered to be an expert. There was to be unquestioned acceptance of the teacher's opinions, with no room for discovery learning based on the critical appraisal of evidence. The teacher's way of doing something became the student's way, and ultimately was the only way. The emphasis in learning was on doing rather than on thinking, analyzing, and synthesizing information. Students were not trained to pursue and analyze evidence, but rather perform according to local practice. These students evolved into practitioners who do the same, performing procedures based on individual bias rather than on objective evidence.

The new approach is to search for evidence to substantiate knowledge. Evidence is critically analyzed in a systematic manner to ensure its validity. Students are not taught what to learn, but how to learn, with the expectation that they will become life-long learners. They are challenged to question "why?", "based on what evidence?", in addition to "how?"

Sometimes we forget that we are scientists, but it is worth remembering. It is worth questioning why we do what we do. Then what we do will be based on evidence and we will be engaged in evidence-based practice. It is worth doing for the benefit of our patients, and ourselves as well.

