Evidence-Based Dentistry: A General Practitioner's Perspective

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Generally speaking, the last thing on a patient's mind when consulting a dentist is whether there is a scientific or evidence-based report to validate the diagnostic or treatment procedures being proposed.

Generally speaking, the main things on a dentist's mind when consulting with a patient are communicating needs, uncovering wants and placing a value on both to gain acceptance of a treatment plan.

When asked about evidence-based practice, general dentists have a problem with the words themselves. The word "base" conjures an image of fundamental change. It implies a change in an essential entity, a foundation, something the practitioner cannot do without. This view fails a commonsense reality check, because the truth is that changes in fundamental practice are not necessary: Practitioners are doing very well and have the good incomes and professional status to prove it.

The word "evidence" also causes a problem, because it has not been part of the vocabulary of clinical practice. It may conjure fear, because it relates to legal and regulatory matters. Evidence is what lawyers bring before a judge and jury in the pursuit of truth and justice.

Imagine this scenario of plausible events. A young dentist is the defendant in a civil action taken by a patient to recover money. In his statement of claim, the plaintiff alleges that for five years he has paid for unnecessary services. The undisputed facts in the matter are derived from the patient's current and past dental records. Records from the plaintiff's previous dentist, whom he had attended since childhood, indicate that no diagnosis of caries or periodontal disease was ever made. These records also indicate that no restorations were placed. At 25 years of age, the plaintiff began attending the defendant, whom he attended for five years. During those five years he complied with the recommendations of the defendant by attending every three months for a periodontal maintenance program and a topical fluoride. He also received 16 preventive composite restorations on his bicuspids and molars. He was exposed to three pan films, a full mouth series of periapical films and five sets of bitewing films. He underwent the surgical removal of an asymptomatic, non-pathological third molar. The plaintiff agrees that no harm was done. He alleges, however, that he suffered unnecessary costs. These costs include the out-of-pocket costs of the fees paid, as well as the costs in lost income because of the time he spent attending these appointments. On the occasion of the removal of the third molar, he lost two days of work.

Evidence from papers in scientific, peer-reviewed journals by authors such as Pitts[1] are provided as exhibits to support the contention that the restorative procedures were unnecessary. Similarly, evidence by authors such as Page and Beck[2] show that the defendant was not at risk for periodontal disease. Furthermore, a periodontal maintenance program (frequent scaling or root planing) as provided by the defendant is not a valid preventive measure (it is an effective treatment modality to maintain patients who have experienced periodontal disease and have undergone therapy).[2] Finally, evidence is presented to indicate that frequent exposure to radiography based on a chronological schedule in the absence of clinical signs or symptoms is inappropriate. This and the topical fluorides, says the plaintiff's lawyer, point to an appalling lack of knowledge about the risk factors associated with dental disease. The lawyer concludes that the care provided was unnecessary and excessive in the circumstances and that money should be returned to the plaintiff.

The statement of defence contends that the case should be summarily dismissed because the first principle of health care was honoured. The defendant did no harm. The defendant's position is that he put in place a rigorous and systematic practice model with a clearly defined end point: extreme prevention. The defendant's lawyer acknowledges the self-interest of his client, but reminds the court of the high cost of a dental education and the high overhead of a practice. He characterizes his client as a good businessman as well as a good dentist who practises within the standards of the community. The lawyer reminds the court that the plaintiff gave tacit approval for the services by not saying, "No". He characterizes the evidence against his client as the "nonsense of absolutes", explaining that clinical judgement cannot be replaced with restrictive parameters derived from scientific papers. Academia is disconnected, he argues; it is an idealized virtual reality that ignores or discards all sorts of information that does not fit its highly

structured methods or narrowly defined questions. Dental practice, on the other hand, is the real world; it is patient-centred, accepting and inclusive. The lawyer reminds the court that the record of science in "doing the right thing" is not above human failings — hubris, self-interest, ambition and, above all, bias.

The most important thing the defendant's lawyer did was to select the right jury. Prospective jurors who know what NIH (National Institutes of Health), NIDCR (National Institute of Dental and Craniofacial Research) or AHCPR (Agency for Health Care Policy and Research) stands for were released prior to selection. All jurors were chosen from the IGDPS (Incredibly Grateful Dental Patients Society) — people who have been socialized to believe that the loss of teeth is inevitable, but who, as older adults, enjoy healthy, functioning dentitions. Rightly or wrongly, these incredibly grateful people credit the practitioners of dentistry, not the fluoride, not the improved self-care, not non-smoking and not other epidemiological factors, with their well state. They trust the dental profession completely. This jury of people from the IGDPS will exonerate this dentist.

This too shall pass, as the members of the IGDPS grow old, lose their influence and die.

Society is experiencing a significant phenomenon, what the press call the Information Age. This new age manifests itself in several ways. Continuous education is as integral to adult life as work itself. Society is coming to expect as much from the dental profession as it gives. It expects dentists to be lifelong learners, to be up to date and to be aware of all the nuances and complexities of modern life. Society will not continue to entitle us with a lifelong status or income.

Society has confidence in its intellectual and technical prowess, which, for our purposes, manifests itself in a belief and expectation that disease can be controlled. In 1605 Sir Francis Bacon advocated the union of craft and scholarly disciplines in the hope of bringing all of nature under the "domination of man as intended by God" and in the hope of producing a "line and race of inventions that would subdue and overcome the necessities and miseries of humanity". Society is beginning to believe that Sir Francis's desires have come true.

Evidence Is Everywhere

In this Information Age, it is not uncommon for a patient to rush home from the dentist's office to look up on the Internet or in health reference texts the drug or diagnosis that was provided. Science in the form of statistical evidence is being introduced into everyday language through advertising. Even alternative products purport to have evidence, though it is usually anecdotal.

In addition to information-seeking patients, society has special interest groups that have a significant stake in evidence-based practice: third-party payers. These include insurance companies, benefit plan administrators and government agencies. The business pressures on third-party payers include demands to manage costs, to extend coverage to implants and other services and to compete for market share by attracting business from competitors.

After 25 years of dental care under a third-party payment method, a large and statistically significant database exists that questions the veracity of the dental profession's claim that prevention pays. Statistical analysis does not support this claim. The regular and continuous users of preventive dental services take considerably more money out of the insurance system than do occasional users of both preventive services and services associated with dental morbidity — extractions, root canal treatment, large restorations and periodontal disease therapies. Analysis of the third-party evidence also shows that patients tend to accept insured services and dentists tend to provide them. Thus, the evidence for best practice could provide a rationale to avoid paying for "nonsense" (i.e., preventive care). Third parties would be in a position of being able to claim that they are improving dental health with their payment policies while reducing costs.

Three Views of Dentistry

The emerging leaders of the information society are forming opinions about the dental profession based on their values and their observations of us at work. In those observations, they are seeing three contradictory images.

Cosmeticians with first aid skills. Generally speaking, appearance is a legitimate treatment outcome. However, if excessive emphasis on cosmetic care (converting wants to needs) leads to harm or to serious patient regret, or if cosmetic care is misrepresented as health care, then over time the profession will be denigrated from a learned health care profession to a complementary or alternative provider.

More is better. Practitioners who appear to believe that "more is better" have reinvented dental hard-tissue disease such that all pits and fissures require restorations and every sensitive tooth needs a crown. Amalgams must be replaced with metal-free restorations. The end point is that virtually all teeth need some level of restoration.

These practitioners have equally overeager ideas of what constitutes periodontal disease. Even a single sighting of gingivitis justifies a diagnosis of periodontal disease and the patient requires a soft tissue management program. The end point is that everyone has disease and no one is ever cured of it.

Trying to do the right thing. Most dental practitioners are trying to do the right thing by their patients, but they have an increasingly complex task. They need to keep pace with the growing body of knowledge about causative and contributing factors in the diagnosis of dental disease. They need to be able to describe and offer a widening range of services to patients who have a greater knowledge and interest in the outcome. Paradoxically, the less we know, the less thinking is needed; as knowledge grows, more thinking is required, because we have to make sense of a lot of evidence.

This may explain why, in a time when society has never been healthier, people are more concerned about disease. Information overload induces anxiety. Patients know that the

right care at the right time offers the best outcome and is available, but uncertainty lives in not knowing whether the caregiver is fully informed, properly equipped and operating in the patient's best interest.

The emerging leaders of society will award us professional status based on where we are heading rather than where we are. They will decide the place of the general practice of dentistry on the continuum between knowledge-based care and alternative therapies.

What do we owe society for the status and protected title it has granted to us thus far in our professional history? And what course of action should the leaders of our profession take to assure that future practitioners will be as well rewarded as we are today?

In practical terms, the place to start is to know the evidence. Training must begin during the undergraduate education program in dental schools. The curriculum must change such that lifelong learning and a problem-solving attitude toward practice are cultivated. Dental students must be trained to be critical readers of the literature. Faculties must set standards for part-time clinical instructors such that denigration of the scientific education does not occur during the clinical phase of the program. Dentists must push the publishers of journals and other sources of knowledge to make information on best practices user-friendly. All the modern tools of communication, such as CD-ROMs and the Internet, should be used. The most important consideration is that published reports must deal with clinically relevant subjects determined through cooperation with practitioners.

The second practical consideration is how to use the evidence garnered. Evidence is just another tool to assist in making a diagnosis or accomplishing a successful treatment. It is not an imprimatur from the saints, nor the exercise of power over dentistry. It is not the role of science to govern. Similarly, it is not a power that the dentist should use to intimidate patients into accepting treatment. Not so many years ago, "Doctor knows best" was the catchphrase used to inspire confidence when no confidence was warranted — doctors often did not know or understand the diseases that confronted them. Clearly, the success that the dental profession currently enjoys has more to do with our success at patient-centred care than with our use of the evidence for best practice.

Evidence is simply a resource to be used appropriately and at the same level as our education and our experience. Science is in essence a linear analytical tool. It measures and counts very well. But it is only one of the tools we use to guide our practice.

Embrace Uncertainty

Harold Slavkin[3] reports with certainty that we are on the threshold of the "biology century", in which we can anticipate the completion of the Human Genome Project and a number of scientific and technological breakthroughs. However, he concludes, "What remains uncertain is the opportunity to obtain optimal health promotion and care for all Americans [society], appropriate cost containment, and optimal health care delivery, while at the same time having the ability to manage the profound ethical, social, and legal issues that accompany the anticipated biology century." Health care professionals are the link between science and the benefit that society will receive.

We must remember the "revenge of unintended consequences": What dental scientist or practitioner could have anticipated that communal water fluoridation could fall into disfavour? We must also keep in mind that the scientific methods currently in use — randomized clinical trials, structured methodologies and systematic reviews — are considered the best today, but a new science is emerging from the theories of chaos and complexity, a science that purports to overcome the limitations of our current methods.

Consider the words of John Ralston Saul:[4] "To know — that is, to have knowledge — is to instinctively understand the relationship between what you know and what you do. That seems to be one of our biggest difficulties. Our actions are only related to tiny, narrow bands of specialist information usually based on a false idea of measurement rather than upon any knowledge — that is understanding — of the larger picture. The result is that where a knowing man or woman would embrace doubt and advance carefully, our enormous specialized, technocratic elite are shielded by a childlike certainty. Whatever we are selling is the absolute truth."

I suggest that we embrace doubt — not the doubt of rejection but the doubt of scepticism — and advance carefully. Plato suggested that we should progress from experience to wisdom. Today we should also progress from scientific knowl-