

## Guest Editorial *Periodontal Medicine in the Next Millennium*

Condensed from part 2 of the keynote conference address presented at Harvard School of Dental Medicine, June 12, 1999. Part 1 appeared in issue 1, 2000 of the journal.

The gap between theory and practice experience during one's formal education can have serious effects on later learning. A recent survey of dental schools conducted by one of us sought to assess the extent to which recent research findings, identified by an expert panel using a modified Delphi approach, have been incorporated into the didactic component of the predoctoral dental curriculum and the clinical experience of dental students. The same survey instrument was provided to 100 general practitioners drawn from study clubs in New England and Virginia, general practitioners serving on a national advisory panel for a major third-party carrier, and the boards of directors of two state dental associations. Seventy-one percent of the dental schools and forty-one percent of the practitioners responded. Clearly the latter do not constitute a representative sample of the approximately 120,000 general practitioners in the United States, but simply provide a rough estimate of how practitioners view the research areas identified by the expert panel. The degree to which recent research findings have been incorporated into the predoctoral curriculum may reflect a recognition that dentistry is continuing to evolve from a health profession that has placed great emphasis on procedures and technical skills to one in which the cognitive aspects of oral healthcare are assuming great importance.

With the possible exception of the risk for periodontal diseases, the degree to which the significant research findings of the past decade as identified by the expert panel have found their way into the predoctoral dental curriculum was encouraging. Somewhat surprising was the finding that the concept of remineralization of enamel through the aggressive use of fluoride therapy and implications for diagnosis and assessment of risk, ie, the nonsurgical treatment of caries, was rated significantly lower than other information dealing with the prevention of caries and the use of composite restorations. The difference in curriculum emphasis between didactic instruction and clinical experience in those areas dealing with the diagnosis and treatment of periodontal diseases is particularly disturbing in that it may reflect a judgment on the part of dental educators that the management of periodontal diseases using the latest information and techniques is beyond the scope of general practice. In practical terms, it would appear that dental students receive little experience and thus do not acquire competency in the monitoring of periodontal pathogens as indicators of treatment outcomes, nor in the use of locally delivered antimicrobials, nor in the nonsurgical management of dental caries. The practitioners gave areas such as putative periodontal pathogens and risk for periodontal diseases very low scores, while prevention of caries, smoking and periodontal disease, and composite restorations were assessed as being extensively incorporated into their practices. For 7 of the 10 areas, a close parallel exists between the clinical experience of students and the practitioners' assessment of their practices.

Given the responses from practitioners, it seemed logical to question the extent to which the 10 research areas might be reflected in continuing education (CE) offerings in the United States. The Academy of General Dentistry's web site was accessed in November 1997, and CE listings for all states were reviewed. This review identified 403 listings, of which 372 included sufficient information to allow a categorization of program content. Approximately 22% of the CE offerings could be related to one or more of the 10 research areas identified by the expert panel. Of these, 65 presentations (17%) were concerned with composites and adhesives, while 8 related to one or more of the 5 research areas relevant to periodontology. One program dealt with the reciprocal relationship between systemic diseases and oral health, and 6 dealt with prevention and treatment of caries by nonsurgical means. The overwhelming majority of CE courses involved orthodontics, practice management, and aspects of implant therapy.

The rather sparse literature addressing the effectiveness of dental CE has been reviewed and the conclusion drawn that, regardless of approach, significant change in practice behavior is not easily demonstrated. Continuing dental education can both facilitate and impede change in clinical practice. All too often dental CE programs are designed with an eye to what will sell, and in many parts of the country serve as a source of nondues revenue for local or state dental associations. In addition, commercial sponsorship of CE is not uncommon. The extent to which these financial considerations deter sponsors from offering programs that reflect new advances is a matter of speculation, but cannot be totally discounted. The challenge of producing effective dental CE is far more complex.

For decades, dental schools have espoused the concept that one of the objectives of dental education is to create a lifelong learner, but little evidence exists that this goal is being aggressively pursued in the dental curriculum. The question of how a practitioner learns is beginning to receive significant attention in academic medicine, and the lessons learned are clearly applicable to dentistry. Clinical experience generates new information that either contradicts or reinforces existing knowledge and is a major driver of change in practice behavior. Peer discussions of clinical experiences facilitate such change. Thus, it is

not surprising that study clubs and replacement of lectures by small group discussions are cited as a preferred approach to CE. A second related concept that must be considered is that new information must be incorporated in a meaningful way into relevant preexisting knowledge. In this way a connection can be made between new concepts. If we accept this relationship between new and preexisting knowledge and experiences shared with colleagues as significant elements in lifelong learning, then the relationship between how practitioners learn and how we educate practitioners while in the formal phase of their education becomes critical. The educational model that the majority of practicing dentists experienced while in dental school, and which persists in CE in dentistry, is the presentation by the dominant clinician of information they deem relevant; dental education at all levels, and for that matter medical education, is characterized by passive learning.

Consider the CE lecture in the light of how practitioners learn. The information conveyed may have different outcomes. It may reinforce an existing practice, and practitioners will continue to do what they have done in the past. If it contradicts, practitioners are likely to reject the new information as inconsistent with their clinical experience. The probability of change in terms of either discontinuing an old practice or adopting a new practice without broad-based reinforcement derived through peer discussion is poor. An additional aspect of this resistance to change may be that a practitioner's clinical experience represents active learning, and as such the knowledge gained is not easily dismissed.

Only recently has dental education begun to embrace active forms of learning, of which problem-based learning is the best example. This approach attempts not only to demonstrate the clinical relevance of basic science information, but to present a method—concept mapping—whereby situations not previously encountered can be addressed by identifying and accessing relevant information. Such an approach is consistent with the principles that (1) learners seek to solve problems that they recognize, (2) learners want to be involved, and (3) teachers must demonstrate how what is learned can be applied. Similarly, case-based instruction allows basic information to be embedded in relevant clinical experiences even though experienced vicariously through the lecturer. In essence, dental education has begun to evolve its approach so that greater integration of basic and clinical information occurs through simultaneous presentation and the introduction of basic information in the context of its relevance to the solution of clinical problems.

What can be done to address some of the abovementioned problem areas? There is an information transfer gap for dentists and physicians. There are several options: (1) increase instruction in clinical microbiology and pharmacology for dental students and practicing clinicians through undergraduate courses, study clubs, postdoctoral training, CE programs, etc; (2) get this information to Congress to support further research studies at the National Institutes of Health, especially through the National Institute of Dental and Craniofacial Research; (3) provide information to lay public vis-à-vis health newsletters, Internet, lay magazines, and newspapers; (4) prepare a review article on periodontal medicine for the *New England Journal of Medicine*.

Periodontal care is as basic to general dentistry as treatment of caries and restorative dentistry. Screening in dental offices for blood sugar levels and HBA<sub>1c</sub>, and Oral Microbiology Testing Service and genetic testing should become routine. Periodontal medicine bridges a void that has existed between the 2 professions for 160 years; data should eventually support the concept that not being thorough in evaluating the patient with periodontal diseases for systemic involvement or determining the oral health status of diabetics, cardiac patients, or pregnant women may be considered negligence on the part of the clinician.

The dental educational system is in crisis, and our hope is that meetings such as this one at Harvard go beyond this audience to dental colleagues, medical colleagues, the lay public, and especially patients—probably the most important group. We should be sending reprints to medical colleagues since we have the same patients in common. We might convince the dental industry, especially pharmaceutical companies, to start educating physicians. Those of us on hospital staffs should schedule papers on diabetes, cardiac disease, obstetrics/gynecology, and pulmonary disease. Arrange for presentations in programs supported by the American Academy of Periodontology, academic institutions, the American Dental Association. Good oral healthcare can help patients avoid the problems of the past and fulfill the goal of preservation of the natural dentition in health and function. We look to the next millennium, but we also look back on the last 100 years and realize the progress we have made. We are very bullish about the future of our profession.

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