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The future of dental education

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COMMENTARY

The Future of Dental Education

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I greatly appreciate the opportunity of addressing this group. I congratulate you on your 39th Annual Meeting and wish you many more. Although I have no clinical expertise in your field, I have been extremely interested in the promotion of dental anesthesiology for a long time.

When Dr. Joel Weaver asked me to speak to your group, he suggested that I speak on the subject of the "Future of Dental Anesthesiology in Dental Education." Assuming that certain strategies are successful, I believe that the future is very bright. I did not believe there was enough definitive substance, however, for me to speak exclusively on that subject. Also, it is my belief that the future of dental anesthesiology is inextricably related to the future of dental education in general and that the two cannot be separated.

I am optimistic about the future of dental education. I am sure that individuals related to the five dental schools that have closed are not so optimistic. Even more significant at the national level is the fact that almost every dental school has had significant budget reductions and is somewhat, if not significantly, smaller than it was 10 to 15 yr ago. That trend may not have stopped. Higher education, including dental education, is under the greatest financial strain it has experienced in the last 3 decades. As student bodies and faculties are reduced, those elements that are not firmly entrenched, such as dental anesthesiology, may be the areas most vulnerable to reductions—that is, unless the leadership of those dental schools are committed to the preservation and enhancement of this most important area.

Dental schools have gotten smaller. In 1978, 5,274 first-year students were admitted. In 1992, only 4,047 were admitted. That is 23% reduction. Since 1987, the number of graduates has decreased from 4,744 to 3,995 in 1991, almost a 16% reduction.

It is not a good time to expect major additions or growth of dental schools. According to reports from the American Dental Association (ADA), the University of Pittsburgh is the only school in the United States that claims a Department of Dental Anesthesiology. Strangely enough, however, in 1991 and 1992 there are no postgraduate students listed as enrolled in an anesthesia program at that school.* In 1991, four dental schools had advanced programs in dental anesthesiology. Loma Linda University graduated three students with certificates; the University of Connecticut had one student enrolled in a doctoral program; the Medical College of Virginia granted one certificate and had one other student enrolled in the certificate program; and Ohio State University granted one certificate and one degree in dental anesthesiology. That is a total of six graduates nationally in this area. In 1992, Loma Linda has two students enrolled; the Medical College of Virginia, one; and Ohio State University, two, for a total of five advanced students nationally.† Only you can tell me whether those numbers are appropriate or not. If not, you need to implement strategies to increase educational opportunities and attract more individuals. My experience is that personal contact is the most effective method.

Clearly, the dental curriculum is changing. In the developed world, we are changing from a restorative-based curriculum to a nonrestorative-based curriculum. Greater concern with dental esthetics will necessitate more emphasis in dental education on the principles of esthetics and how they relate to clinical practice. All dentally aware patients in the 21st century will expect dentists to provide them with optimally esthetic oral care. There probably is no area more dramatically influenced today by emergence of high technology in assisting dentists than the area of

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* It is my understanding that Loma Linda has recently organized a department of anesthesiology in the School of Dentistry and that the University of Pittsburgh does maintain a training program. However, data on graduates from that program have apparently not been submitted to the ADA. Additional dentists receive training in anesthesiology at various nondental school institutions.

† Additional dentists receive anesthesia training at various institutions not affiliated with dental schools. The ADA does not have statistics on these programs, but recent trends suggest that these programs are disappearing.

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esthetic dentistry. The widespread use of computer-imaging is only a forecast of the possibilities that await us.

The dental curriculum will have to prepare graduates much better in the nonrestorative areas of dentistry, namely preventive dentistry, periodontics, endodontics, orthodontics, and oral surgery. It is easy to see an increased role for advanced modalities in pain and anxiety control related to many of these disciplines.

Dental education, as we know it today, is based primarily on the oral health needs of the generally systemically healthy population. The curriculum of the future will center much more around patients with specific needs, for example, the geriatric patient, the medically compromised patient, the mentally and physically handicapped patient, and the hospitalized or institutionalized patient. Again, the role of advanced dental anesthesiology related to care for these patients is obvious. This broader mix of patients essentially means that, after providing a general dental education for students, we will have to change the venue where students learn to deliver dental care. The students and their faculty will have to learn to deliver oral health care in the hospital, in emergency clinics, in the nursing home, and in the patient's residence. We will have to teach the students how to manage their handicapped patients as well as the older patient who is taking multiple medications for treatment of chronic diseases. We will have to work more closely with physicians and other health care providers, because the care of many patients will be more complex than it has been in the past.

The armamentarium of the dentist will change dramatically. Rotatory instrumentation for dental surgery will virtually become a thing of the past and will be replaced by lasers and various chemical agents. We are already using the laser in dentally related research and in soft-tissue procedures.

The two-dimensional radiograph will be replaced with three-dimensional computerized tomography of some type to greatly enhance the ability of the dentist to detect and diagnose tooth and other oral disease problems. The growth of the use of computers in all aspects of life is evident. A high-technology procedure adopted for dentistry from industry, the CAD/CAM (computer assisted design and manufacturing) is perhaps the most impressive revolution to confront us. To be able to take an "electronic impression" of a tooth preparation and fabricate an electronically manufactured restoration surely would have been considered science fiction just a few years ago.

In order to relate and prosper in this new society, dentists must be able to gain information and handle it more readily. Dentists must be able to communicate information more effectively to their patients and to their communities in general, especially as it relates to preventive procedures and maintenance of health. General education and dental education in particular must improve the communication skills of our students.

The dental curriculum must become more flexible in its format. The time-honored lecture-based disciplinary course format must give way to an integrated interdisciplinary format using a multimedia approach in delivering the basic information students need. The basic human biological sciences will become more significant to the practice of dentistry. Greater use of advanced conscious sedation and pain control procedures alone will justify that, as will the advanced physical evaluation required by the dentist. Basic and clinical research findings must be introduced expediently into the curriculum. They must be integrated and correlated with clinical sciences in ways that make them relevant and meaningful to the student. It is imperative that the scientific method be an integral part of the teaching program to foster scientific thinking on the part of the practicing dentist. Basic biological principles will always need to be learned by dental students, but this must be done in a way to produce long-term memory retention. More clinically related experiences and problem solving, rather than rote memory of principles and facts, will make this possible.

I do not place much emphasis on the amount of time a subject matter is taught, because there are so many other factors that determine the effectiveness of instruction. There actually has been a decrease in the amount of clock hours devoted to pain and anxiety control in the predoctoral curriculum. In 1976, an average of 52.6 hr was devoted to these subjects. The amount of time has slowly decreased until 1990, when it was only 43.6 hr.

I strongly encourage maintaining dentistry as a unique and separate profession, educationally and in practice. This may appear obvious, but believe me there are those who would have dentistry be subsumed under medicine. It is ironic that this model of education is being advocated at the same time that Western Europe, after 100 yr of experience with it, has realized its deficiencies. Indeed, as the European Community becomes official, they are requiring independent dental schools. Certainly many of the principles and bodies of knowledge of dentistry are the same as other health professions. However, there is enough uniqueness to dentistry, in my opinion, that it can best be served as a separate and self-governed entity.

The type and nature of the auxiliary and supportive staff for dentistry undoubtedly will change with time and place. New types of ancillary support for dental anesthesiology is an example. The important things are that we stay adaptable to change and that the dentist remains the decision maker and leader of the dental team.

There have been significant strides made in the area of enhancement of the quality of teaching conscious sedation and pain control in the predoctoral curriculum. The

teaching guidelines have been revised several times in the past few years and are under revision currently.

It is extremely important that clinical guidelines be satisfied for students to be at least minimally proficient in the modalities taught. For example, the current guidelines state that each student must have experience in managing a minimum of 15 patients in each modality (eg, inhalation and intravenous conscious sedation) before being certified as competent. It is my understanding that most state boards of dental examiners have agreed with these guidelines and are using them for authorization of dentists to practice the respective modality. However, you must carefully be aware of your state laws relative to what you may or may not do in practice. Some of the regulations are vague. Your future may relate directly to how successful you are in getting and interpreting the laws to support your practices.

As you well know, the Council on Dental Education also has guidelines for teaching comprehensive control of pain and anxiety at the advanced educational level and in continuing education programs.

The ADA rightly requires that, "if competencies are to be taught in the area of conscious sedation, it is essential to have an adequate preclinical and clinical curriculum, well trained faculty for whom anesthesiology and pain control are areas of major proficiency, plus fully equipped facilities." Obviously, an adequate didactic and clinical curriculum in physical evaluation is a necessary foundation for implementing a sound program in anesthesiology.

Certainly the needs for the types of dental specialist will change with the future. In the early 1950s, an application was submitted for the ADA to recognize dental anesthesiology as a specialty. Obviously, that application was not approved and, to the best of my knowledge, the discipline has not applied for specialty status since then. Endodontics was approved as a specialty by the ADA House of Delegates in 1963, being the last dental specialty recognized.

I think one of the strategies facing your discipline to ensure its proper place in the future is whether or not you believe you should be a recognized specialty of the ADA. In the mid 1980s an organized, consistent format with explicit criteria was developed by the Council on Dental Education for applications from existing specialties to determine whether or not they should continue to be recognized, or for new disciplines to be considered. The criteria for recognition of a specialty are as follows:

- The area must be a distinct and well-defined field that requires unique knowledge and skills beyond those commonly possessed by general practitioners.
- The scope of the specialty shall not be coincident with or readily subsumed within the scope of other recognized specialties.
- Substantial public need or demand for services that cannot be adequately met by general practitioners or specialists in other recognized areas must be documented.
- A specialty must incorporate some aspect of clinical practice (ie, individuals in the specialty must provide health services for the public).
- Formal advanced education programs of at least 2 yr beyond the predoctoral curriculum must exist to provide special knowledge and skills required for practice of the specialty.

On the one hand, I believe we should do everything possible to prevent dentistry from becoming overspecialized and to sustain the broad base of primary-care providers we currently enjoy. I know we can serve the public best with that approach. On the other hand, the nature of our profession does promote certain areas that deserve and indeed should require recognition as a specialty. Only those of you in this room can address that issue relative to dental anesthesiology, but I do believe the future of your discipline is significantly related to what is done in this regard.

We must realize that dental school is clearly only the beginning of one's education. We must imbue our students with the notion that they learn only a little dentistry while in school and that they can only stay abreast of the changing nature of dentistry by a vigorous life-long program in continuing education. That challenge is even greater in areas such as diagnosis, physical evaluation, and conscious sedation and pain control than it is in the more direct patient treatment areas.

Dentistry, like so many aspects of human endeavor, is truly at a crossroad as we approach the 21st century. Many important decisions and actions will have to be taken. John Naisbitt, in his book *Megatrends,* states that at the end of the 19th century the railroad industry was also at a crossroad. The industry thought that it was in the railroad business and made its decisions accordingly. It did not realize that it really was in the transportation business. If it had realized that, it probably would have made different decisions and its future would have been bright and secure. We in dentistry must realize that we are not, merely, in the tooth business; we are in the total patient care, oral-stomatognathic health business. With that as our guide, we will produce the type of dental education and dental practitioners needed for the 21st century. Thank you!