

Development of Orofacial Pain Programs in Dental Schools

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This paper discusses the critical issues that surround the development of an orofacial pain program in a dental school and suggests strategies to address them. Since the University of Minnesota has an established orofacial pain program involved in both predoctoral and postdoctoral teaching, clinical and basic research, and interdisciplinary patient care over the past 20 years, this article uses this as a model for development of an orofacial pain program. The proposal includes overall goals, background and rationale, specific aims, and program activities, including teaching, research, patient care, and financial and resource needs. These features may be of assistance to those considering the development of such programs in the United States and elsewhere in the world.

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Orofacial pain, one of the newest disciplines of dentistry, includes the assessment, diagnosis, and treatment of patients with complex chronic orofacial pain and dysfunction disorders, oromotor disorders, and chronic head and neck pain, as well as the pursuit of knowledge of the underlying pathophysiology and mechanisms of these disorders (American Academy of Orofacial Pain, Specialty Application to the American Dental Association, 2000). Specifically, the discipline includes the understanding, diagnosis, and treatment of 8 groups of chronic orofacial disorders: (1) neuropathic and sympathetically mediated orofacial pain disorders, (2) neurovascular orofacial pain disorders, (3) masticatory and cervical neuromuscular pain disorders, (4) primary headache disorders, (5) temporomandibular joint disorders, (6) pain secondary to orofacial cancer and AIDS, (7) orofacial dyskinesias and dystonias, and (8) orofacial sleep disorders.¹

According to prevalence studies, over 7% of the population in the United States, or 13 million people, have experienced a chronic orofacial pain disorder needing treatment in the past year.¹⁻³ There is evidence that suggests that patients with orofacial pain disorders are not being treated adequately by current general practitioners or dental specialists and that nearly 50% of these people in the general population are left untreated and continue to suffer from pain. For example, a 1999 general population survey by Portenoy⁴ found that, of 805 individuals who reported having a persistent pain disorder, more than 4 of 10 were unable to find adequate relief, and stated that their pain was out of control—despite having the pain for more than 5 years and switching doctors at least once. Other studies of chronic orofacial pain patients have found that these patients have previously been under the care of a high number of clinicians (a mean of 5.3) and suffered many

years with pain (mean of 4.2 years) prior to seeing a dentist with expertise in orofacial pain management.⁵ According to a 1999 practice survey of 403 dentists in the United States, the percent of dentists who treat any of these patients is low: general dentists (14%), oral surgeons (22%), orthodontists (13%), endodontists (5%), periodontists (4%), prosthodontists (5%), and pediatric dentists (11%). Nearly all (95%) had less than 5% of their practice in the field of orofacial pain management.⁵ Furthermore, the survey also found that 89% of dentists would rather refer chronic orofacial pain patients because they are too complex (78%) and feel insufficiently trained to treat them (81%).

If recognition and treatment of the problem by clinicians is inadequate or inappropriate, the personal impact can be tragic and the costs great. Persistent pain can cause depression, suicidal tendencies, dependent relationships, loss of work, disability, and lifestyle disturbances. It can lead to patients undergoing many surgeries, diagnostic tests, long-term medications, and an ongoing dependency and drain on the health care system. A 1985 Harris Poll² found that 157 million workdays are lost due to head pain; orofacial pain disorders account for approximately 50% of the lost time.

With this prevalence, impact, and lack of involvement among general dentists and dental specialists, the need for teaching of the basic and clinical sciences of orofacial pain at both the predoctoral and postdoctoral dental curricula is great. Yet, in most dental schools, the clinical or basic science knowledge of orofacial pain is limited to predoctoral courses, minimal exposure in existing specialties, and a few advanced education programs (only 10 in North America, for example). The small number of existing postdoctoral orofacial pain programs has also limited the number of faculty trained for academic careers in teaching, research, and patient care in this field. In addition, with an estimated 13 million patients in the United States seeking care for a chronic orofacial pain problem annually,¹⁻³ the most conservative estimate of the number of trained orofacial pain dentists who focus their careers in this field who are needed to meet the demand for patient care is 2,850 nationally in this country. This is consistent with the number of specialists in most existing specialty fields of dentistry. Currently, only about 20 dentists are trained annually in existing orofacial pain advanced education programs in the United States, which is much less than most other dental specialties. It is likely that analogous proportions occur in most other countries.

These challenges can be overcome with the development of orofacial pain programs in dental schools and an increase in the number of dentists who focus their careers in this discipline. The University of Minnesota has developed an orofacial pain program in both predoctoral and postdoctoral teaching, clinical and basic research, and interdisciplinary patient care over the past 20 years to address this need. Using this as a model for development of an orofacial pain program, this paper discusses the critical issues that surround the development of these programs in a dental school and suggests strategies to address them. These features may be of assistance to those considering the development of such programs in the United States and elsewhere in the world.

The Emergence of Advanced Education Programs in Orofacial Pain

The emergence of the field of orofacial pain as a discipline during the last 20 years has occurred because of: (1) the recognition that orofacial pain disorders are a significant clinical problem with a prevalence that is comparable to other major dental diseases; (2) the need to develop a scientifically supported knowledge base for improved understanding of the diagnosis and management of pain and dysfunction in the masticatory system, orofacial region, and related structures; (3) the need for both clinicians and faculty with sufficient training and experience in orofacial pain to provide patient care, teaching, and/or research in the field; and (4) the lack of significant inclusion of knowledge and training in orofacial pain management with other dental and medical fields.

The development of advanced education programs in orofacial pain recognizes the substantial body of new knowledge and skills required by dentists to focus their careers in this field, provide broad-based patient care, and further develop and expand their knowledge on which clinical practice is based. Generally, it is these specially trained dentists who can provide the bulk of teaching and research needed in this field. The general objectives of these advanced training programs are the following:

- Train faculty for teaching at the predoctoral and postdoctoral levels in dental schools.
- Train clinical research faculty to staff dental schools and other units of health science centers, universities, and hospitals interested in the field of orofacial pain.

Table 1 Information on Advanced Education Programs in Orofacial Pain that are a Minimum of 2 Years*

Institution	No. of students	Degree
University of Minnesota	2 per year	MS or PhD and Certificate in Orofacial Pain
University of California, Los Angeles	2 per year	MS or PhD and Certificate in Orofacial Pain
Tufts University	3 per year	MS and Certificate in Orofacial Pain
University of Florida	1 to 2 per year	MS and Certificate in Orofacial Pain
University at Buffalo	2 to 3 per year	MS or PhD in Orofacial Pain
University of Kentucky	1 to 2 per year	MS and Certificate in Orofacial Pain
Eastman Dental Center, University of Rochester, New York	1 to 2 per year	Certificate in Orofacial Pain
University of Alberta, Canada	1 to 2 per year	MS and Certificate in Orofacial Pain
Naval Dental School, Bethesda, Maryland	1 to 2 per year	Certificate in Orofacial Pain
Harvard University	1 to 2 per year	MS and Certificate in Orofacial Pain

*Changes may have occurred since the survey.

- Train clinicians to provide interdisciplinary care for patients with chronic orofacial pain disorders in private practice or institution-based clinics.

Formal education of 2 or more years in orofacial pain has been available for more than 20 years at various dental schools in the United States. The total first-year enrollment in advanced education programs in orofacial pain in July of 1998 was 20. In addition to the clinically based specialty programs, there are at least 3 PhD combined programs in neuroscience and orofacial pain (University at Buffalo, the University of Minnesota, and the University of California at Los Angeles), which are run concurrently with clinical certificate programs in orofacial pain. Some of these programs have support from the National Institute of Dental and Craniofacial Research (NIDCR) in the United States through the Dentist-Scientist Program. The curricula of these advanced education programs are consistent with that defined by the American Dental Association's Commission of Dental Accreditation's Standards for Advanced Specialty Education Programs. In addition, the curricula are consistent with standards recognized by the American Board of Orofacial Pain, the American Academy of Orofacial Pain (AAOP), and the American Dental Education Association. The operational standards are defined in *Standards for Advanced Specialty Education Programs in Orofacial Pain* as adopted by the AAOP in 1994 and revised in 1999.⁶ An

accreditation process to guide the revision and development of new postdoctoral programs in the field has been established by the AAOP. To date, the accreditation site visit process has been university-based and utilizes the *Advanced Education in Orofacial Pain Self-Study Accreditation* document.⁷

A survey has been recently conducted in North America of all university-based educational programs in orofacial pain to determine the enrollment, characteristics, and other relevant information. Table 1 presents a summary of some of this information.

Development of New Interdisciplinary Orofacial Pain Programs

The accreditation standards for advanced education in orofacial pain present an altruistic goal to achieve for dental schools willing to address this need. When implemented, they would enable dental schools to have sufficient faculty and staff to teach this discipline at both the predoctoral and postdoctoral level and to conduct significant research. However, in reality, most programs are minimally staffed by faculty who often have high teaching responsibilities in other areas or have heavy patient responsibilities that prevent development of an orofacial pain program at their dental school. Yet a well-qualified faculty is the primary and critical requisite for developing a

successful dental school orofacial pain program that includes predoctoral and postdoctoral study and research.

To achieve this goal, there needs to be a commitment on the part of the institution to meet the predoctoral and postdoctoral educational standards of the field and provide research and patient care. This requires hiring the faculty sufficient to establish a program that is a recognized entity within the institution's administrative structure and is dedicated to all 3 missions of the dental school: education, research, and patient care. It should provide for the involvement of teaching faculty in the selection of candidates, program planning, and frequent program evaluation. The curriculum should include biomedical, behavioral, and clinical sciences that are best implemented with interdisciplinary faculty whose primary responsibility is the orofacial pain program. For example, curriculum in the behavioral sciences can be directed by psychologists, biomedical basic sciences can be taught by basic scientists, and clinical sciences conducted by clinical specialists. Advances and implementation of new knowledge can also be improved by the interaction of the different faculty. Thus, both predoctoral and postdoctoral teaching and research in each of these areas is facilitated with the development of a complete interdisciplinary orofacial pain program. Other papers presented at the conference and published in this issue of the journal⁸⁻¹⁰ also emphasize these interdisciplinary needs.

Development of the University of Minnesota Interdisciplinary Orofacial Pain Program

Overall Goals

Accomplishing the goals of a new program can present many hurdles, not the least of which is gaining support and funding from the administration. In the earlier days of the University of Minnesota program, it was helpful to have specific goals, aims, activities, and details on space, personnel, and financial needs of the orofacial pain program defined for the school's administration.

The overall goals of the program included the following:

1. Develop a clinic to provide care for patients with orofacial pain problems from an interdisciplinary pain management perspective.

2. Conduct pain research through clinical trials and the transfer of basic neuroscience research into the clinic.
3. Train students in orofacial pain management at the predoctoral and postdoctoral levels.
4. Perform outreach activities that will help transfer knowledge to the practicing clinician.
5. Recognize the need to be cost-neutral to the dental school, since development occurred during a time of retrenchment in state funds to the dental school.

Background and Rationale

The transfer of research in the fields of neurosciences, pain-related sciences, and, specifically, orofacial pain has led to discoveries that have provided significant benefit for patients with chronic orofacial pain. These scientific advances have improved our understanding of the epidemiology, basic mechanisms, etiology, and diagnostic and treatment strategies for chronic orofacial pain disorders and fueled development of safe and effective treatments for these patients and training curricula to disseminate this knowledge.

Development of an orofacial pain program has a number of advantages and complements many of the strategic goals of a dental school.

1. The orofacial pain program is a visible demonstration of interdisciplinary activities that transcend disciplinary boundaries including dentistry, medicine, and psychology.
2. The development of clinical, research, and educational programs in orofacial pain complements and enhances basic science knowledge and allows for more opportunity for technology transfer into clinical practice.
3. There is a strong demand for research and education on orofacial pain disorders. Headache and orofacial pain are among the most common disorders in our society and constitute a major share of health care and disability expenditures. The program can stimulate expanded research and educational efforts in the developing field of orofacial pain. An interdisciplinary program in this expanding area of dentistry is important in being competitive in attracting patients and funding for research.
4. There are a large number of patients in the community with orofacial pain disorders. An orofacial pain program will bring more patients into the clinics in general and provide a source of new patients throughout the school.

Specific Aims

The specific aims of the orofacial pain program include the following:

Aim 1: Identify Faculty, Space, and Resources.

Physical and human resources need to be specified to help in the establishment of the program.

- Identify faculty who are interested in the program. This includes clinicians as well as researchers with an interest in pain.
- Secure dedicated space. The space needs are described in Table 2.
- Ensure sources of funds to upgrade the physical facility to meet the needs of the program and purchase equipment and supplies.
- Identify sources of transitional operational funds to support some staff and marketing until the program is financially stable. A major aim of the program is to ensure that many of the activities of the program eventually become self-supporting through funds from clinical income and educational and research activities.

Aim 2: Integrate Patient Care Pain Services into a Single Clinic. Several patient care services need to be integrated into 1 interdisciplinary patient care program that uses team care to manage patients.

- Establish patient care models for orofacial pain that are consistent with national guidelines and supported by administrative systems that reflect evidence-based quality care, cost-effectiveness, and comprehensiveness. Health professionals in dentistry, health psychology, physical therapy, and, as necessary, other providers including those in medicine, nursing, and pharmacy, need to be included.
- Establish diverse pain services that include outpatient and consultative pain services by utilizing the program's core orofacial pain dentists.
- Develop broad referral sources by developing an effective and appropriate plan to market the program and contract for pain services with managed care and worker's compensation organizations.

Aim 3: Expand Pain Research. Continue and expand current sponsored pain research to develop a better understanding of pain mechanisms and transfer new technologies and interventions involving pain modulation into patient care.

Table 2 Estimate of Space Needs for a New Orofacial Pain (OFP) Program

Personnel needs	Office needs	Clinic needs
2 FT OFP dentists	2 rooms	2 rooms
2 PT OFP dentists	1 room	—
1 health psychologist	1 room	1
1 physical therapist	1 room	2
1 secretary	1 room	—
2 dental assistants	Clinic	1 chart room, 1 laboratory, 1 impression room
1 receptionist	Clinic	1 reception room
4 OFP residents	1 office suite	4 rooms
Totals	7 rooms	13 rooms

- Establish a pain research group, which includes neuroscientists, clinical researchers, epidemiologists, and statisticians, that focuses its expertise on research into new methods of pain control. Meet regularly in seminars to exchange knowledge, develop research projects, and coordinate applications for funding.
- Conduct sponsored clinical trials on new or traditional pain management strategies for both common and uncommon orofacial pain disorders. Submit research proposals to corporate, private, and federal agencies.
- Establish a network of region pain clinics that can collaborate in clinical research to build a common database and to compare outcomes of research efforts.

Aim 4: Focus Educational and Outreach Efforts in Orofacial Pain. Establish educational programs to train clinicians in each of the health sciences units to understand and improve management of pain, as well as train health professionals who wish to focus their careers in orofacial pain management.

- Train residents and fellows in dentistry in a 2-year advanced education program in orofacial pain and integrate clinical pain management and basic research training in PhD programs for dentists and clinicians/neuroscientists interested in orofacial pain.
- Establish new curricula or courses for medical, dental, and other health science predoctoral students that include the most current clinical and basic concepts regarding all types of pain management and team care.
- Conduct outreach continuing education to health providers to improve the transfer of

knowledge to the practicing clinician. This could take the form of an annual pain management course for health care providers and a 3-day hands-on “mini-residency” in orofacial pain management for health care providers.

Steps in Development

In 1980, the University of Minnesota, with support and faculty from the divisions of Oral and Maxillofacial Surgery, Oral Diagnosis, and Occlusion, initiated the development of a TMD and Orofacial Pain Program. Initially, the school provided a dental faculty position, clinic space, and a part-time clinical psychologist and physical therapist to provide care in the Orofacial Pain Program. These latter positions were dependent on the income that they generated in their clinical activities to be sufficient to cover the cost of the position. The faculty from the Occlusion and TMD programs were integrated with the Orofacial Pain Program to build a more cohesive clinical and educational program in the field. As demand for care and clinical income rose, the addition of a resident in orofacial pain was approved to meet the demand. With this critical mass of faculty of the integrated program, the advanced education program was increased to 4 students and the clinic was open 4 full days per week. This generated sufficient income to support the psychologist and physical therapist on a full-time basis, to establish a broader teaching program, and to allow time for the existing faculty to engage in research initiatives and submit grants. The NIDCR and corporate-sponsored research focused on experimental and observational epidemiologic studies, including clinical trials, diagnostic testing, and diagnostic criteria development. The evolving clinical research program led the school to support the addition of basic neuroscience faculty with an interest in pain to complement the clinical program and provide teaching in basic neurosciences and pain sciences. This also laid the groundwork for translational research that integrated clinical and basic sciences and the development of a PhD program in neurosciences with clinical training in orofacial pain. A pain-training grant was awarded to the University of Minnesota by NIDCR in 1992 to train researchers in the field.

Predoctoral Teaching

With this expanded TMD and Orofacial Pain Program, the predoctoral teaching program in orofacial pain has been improved, but the finite cur-

riculum time limited comprehensive teaching of the field to predoctoral students. Thus, most dental students received didactic knowledge of orofacial pain disorders, with more emphasis on didactic lectures and less involvement in clinical experiences. Table 3 lists the didactic, laboratory, and clinical experiences that the predoctoral students have in orofacial pain and related fields at the University of Minnesota. There has been some collaboration and synergism with faculty in the school's divisions of Orofacial Pain, Oral and Maxillofacial Surgery, Oral Medicine and Oral Diagnosis, Restorative Dentistry, and Oral Biology to ensure that both the basic science and clinical aspects of TMD and orofacial pain have been addressed with minimal overlap. However, there is still primary emphasis on TMD in the curriculum with less time available for teaching of other orofacial pain disorders. Thus, competency at the predoctoral level is still measured primarily through written examination.

Integration with Other Dental and Medical Specialties

There is a primary emphasis at the University of Minnesota in the value of the interdisciplinary knowledge base for the field of orofacial pain. Faculty from existing dental specialties, many medical specialties, and neurosciences at the school also take an active role in most aspects of the educational program. For example, the third-year predoctoral lecture course in orofacial pain includes faculty from Dentistry, Psychology, Physical Therapy, and Oral and Maxillofacial Surgery. The direct patient care activities of the Orofacial Pain Clinic include faculty in Psychology, Physical Therapy, Oral Medicine, and Oral and Maxillofacial Surgery. In addition, faculty from many medical specialties, including Pain Medicine, Orthopedics, Rheumatology, Neurology, Neurosurgery, and Psychiatry, provide didactic lectures, clinical rotations for residents, interdisciplinary patient care, and collaboration in research. For example, neuroscientists consult in integrated basic and clinical research projects, and rheumatologists, oral and maxillofacial surgeons, oral medicine dentists, oral pathologists, and pain medicine physicians consult in clinical research.

Conclusion

The high prevalence, impact, and lack of interest among most general dentists and existing dental

Table 3 Predoctoral Course Offerings in Orofacial Pain (Including Temporomandibular Disorders [TMD]) at the University of Minnesota

Dental school year	Course title	Credits	Division
First year	Neurosciences (with emphasis in pain)	4 credits, lecture	Oral Biology
Second year	Oral medicine (with lectures on burning mouth and neuropathic pain)	2 credits	Oral Medicine and Oral Diagnosis
Second year	Oral and maxillofacial surgery lectures on TMD	2 credits	Oral and Maxillofacial Surgery
Second year	Occlusion (with some lectures and clinical evaluation of TMD)	2 credits, lecture with lab	Restorative
Third year	Endodontics (with some lectures on diagnosis and treatment of orofacial and dental pain)	2 credits, lecture	Endodontics
Third year	TMD and orofacial pain	3 credits, lecture with optional clinic rotation	Orofacial Pain
Fourth year	TMD mini-residency and patient care	Rotation	Orofacial Pain

specialists support the need for more teaching and research programs in orofacial pain in dental schools. However, the development of predoctoral and postdoctoral teaching programs in dental schools can be enhanced by the development of a comprehensive orofacial pain program staffed by diverse faculty with backgrounds in clinical orofacial pain, clinical pain science, neurosciences, and behavioral sciences. There are many hurdles to overcome in developing such a program, with the most critical issue being the lack of availability of faculty positions. Recognition of the field by national dental associations and accrediting bodies may help provide some federal funds to eventually support advanced education programs. However, orofacial pain programs are currently dependent on the administration of dental schools and ultimately on the talents of the orofacial pain faculty to create an attractive and exciting program that meets each mission of a dental school: service, teaching, and research.

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