

# Role of Oral Medicine in the Teaching of Temporomandibular Disorders and Orofacial Pain

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*This paper discusses the role of oral medicine in the teaching of temporomandibular disorders (TMD) and orofacial pain. Education in orofacial pain and TMD has traditionally been managed in academic dental settings as 2 distinct processes separate from the teaching of diagnosis and management as applied to systemic diseases and oral conditions. The rationale for such a segmented approach appears to have been driven by the concept that orofacial pain usually reflects a localized disease rather than arising as a component of more generalized systemic disease or modulated in intensity or morbidity by systemic pathology, generalized neurobiological, or behavioral contributors. Conversely, oral disease and head and neck manifestations of systemic disease often provoke pain as a major symptom. Management of such conditions should include acute and long-term pain management strategies when the underlying condition has no definitive cure and the pain is disabling. An argument is made for integrating the teaching of oral medicine and orofacial pain to enhance a broad-based approach to the assessment and management of primary pain disorders and to assure appropriate management of pain that is associated with mucosal disease and other forms of regional or systemic pathology including behavioral disorders that present as somatic and painful complaints.*

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The teaching of any broad topic such as orofacial pain or oncology in professional health sciences education is beyond the scope of any single discipline or group. This is particularly true if those in higher education desire to achieve a maximum level of clinical effectiveness from recipients of that education. Chronic orofacial pain and its most common derivative, temporomandibular disorders (TMD), have parameters that escape any single discipline, including anatomy, physiology, pathology, pharmacology, psychology, and behavioral science. The same is true for topics traditionally encompassed within the field of oral medicine. As described by Dr Sessle in his article<sup>1</sup> in this issue of the journal, the biology of pain is extremely complex and includes physical, cellular, metabolic, and molecular components.

A comprehensive approach to pain assessment and management within the predoctoral curriculum also requires an intimate understanding of structural and functional aspects of human biology. Successful diagnosis and management of any form of chronic orofacial pain demand analytic and decision-making skills that go considerably beyond knowledge of pain mechanisms alone. It is

therefore very important that the arena of pain diagnosis and management has a strong foundation in the diagnostic sciences and oral medicine, with oral medicine defined for purposes of this presentation as the diagnosis and non-surgical management of diseases of the orofacial complex. Inherent in the concept of diagnostic sciences and oral medicine is the area of behavioral medicine, which interfaces with other areas of clinical science to provide the diagnostic and patient management skills vital in pain diagnosis and management.

Preparation of graduates, whether in the traditional dental curriculum or in advanced educational training, requires mobilization of all of the expert resources available. Those involved in teaching, research, and patient care in oral medicine must be either active or potential participants in the discussion about education in TMD and orofacial pain.

### **The Traditional Approach and Its Limitations**

A simple review of traditional dental curricula identifies a number of interesting observations related to the relative attention given to discussions of orofacial pain and TMD compared with other topics. It is fascinating to note that students spend many hours in courses such as oral pathology to learn about conditions that they are virtually guaranteed never to encounter in their clinical practice, while they spend little if any time learning about conditions that present primarily as painful symptoms, are far more common, and are essentially certain to manifest themselves repeatedly during the career of the practitioner. For example, we know from epidemiologic studies that TMD, facial migraine, referred pain from regional pathology, hypertension headaches, cranial neuralgias and neuropathies, pain secondary to orofacial movement disorders, tension-type headache, degenerative arthritis, painful autoimmune diseases, burning mouth syndrome, referred cervical myofascial pain, and persistent orofacial pain all have manifestations as psychologic and behavioral dysfunctions. All are very common conditions. Yet the time allotted to these dysfunctions in the didactic and clinical experience of dental students rarely constitutes more than a few hours, or 2 or 3 dozen hours at the most. The problem, in part, has been that our own desire to protect areas of our own special interest from the meddling attention of others has led us to fail to appreciate that an integrated or collaborative approach to teaching about

pain and pain assessment could provide a more effective curriculum experience and potentially provide students with better patient management skills in the area of chronic facial pain.

If we take a very simplistic approach for a moment, consider the concept of an educational process designed on the basis of a matrix format, with the area of curriculum listed on one axis and the topic area across the other axis. For example, assume that such a matrix identifies several areas of clinical skills development (interviewing and history taking, medical history, medication history, dental history, psychosocial history, vital signs, general physical assessment, behavioral status assessment, head and neck examination, radiographic assessment, laboratory assessment, etc). Analysis of the extent to which pain topics are meaningfully included provides some understanding about whether the pain curriculum is integrated or isolated.

The problem with any isolated approach is that it inadvertently trains the clinician to think of a potential relationship between the clinical or history assessment findings only when it is the chief complaint of the patient, not when the pain symptom emerges as a low-grade or chronic complaint. The result is lack of attention to the complaint, and frequently, failure to establish a patient problem list that includes the subacute condition, thereby allowing it to become more progressive and damaging. For example, consider a patient who presented for routine dental care and also incidentally reported a sensation of mild discomfort in the ramus of the mandible. However, since the clinician's interest was drawn to the patient's dental needs, which did not seem related to the secondary complaint of mild medial ramus discomfort, the complaint was not explored; this resulted in progression of a carcinoma on the base of the tongue to the point that, upon discovery, only palliative care could be provided.

Did the student have good training about carcinoma? Absolutely. Did the student understand the physical manifestation of carcinoma? Yes. Was the student able to describe the histologic characteristics of carcinoma? Yes. Did the student even think that the secondary symptom complaint of the patient was important, meaningful, or a signal of potentially grave risk? No. Why? We cannot say for certain, but since we often teach in isolation, topics are presented in such a manner that students and practitioners alike fail to consider them in the context of larger biologic issues, and if the student at the moment of discovery is not thinking of malignant disease or other aggressive processes,

the tendency is to connect the finding to conditions that are assumed to be more frequent, since they make up a larger or more prominent part of the curriculum.

Another example of dysfunction within educational activities in dentistry is the excessive emphasis on possible connections between occlusion and other oral problems such as TMD, bruxism, recession, periodontal tissue breakdown, and structural changes in cervical tissues of teeth. Since occlusion and restorative issues in occlusion are such a major and strong force in most dental curricula, there is a strong tendency to link occlusal variations with all sorts of pathology and symptoms, even when evidence-based assessment cannot establish strong relationships. A unified approach connecting the core areas of diagnosis, oral medicine, and orofacial pain has perhaps the most promising potential for expanding the horizons and scope of dental practice. It is even possible that collaborative integration of didactic teaching in facial pain and oral medicine could change the face of dental training.

### An Integrated Approach

To address this challenge it is proposed that those charged with teaching diagnosis, general and internal medicine in dentistry, oral medicine, pharmacotherapeutics, TMD, and acute and chronic orofacial pain develop a very close working relationship. The ultimate goal for this collaboration is the integration of didactic and clinical training of predoctoral students in oral medicine and orofacial pain. It is further proposed that these discipline areas consider their positions as the very core of broad clinical training in dentistry that involves all but the surgical and restorative components of the profession. The best analog in medicine is the field of internal medicine, with its subspecialty areas such as dermatology, gastrointestinal medicine, and rheumatology. Members of those subspecialties are internists first and experts in a subdiscipline second. At our medical school they all participate meaningfully in the training of medical students in the area of patient assessment and diagnosis, including the behavioral components of the patient workup. The power of the concept proposed here is that all of the subspecialty faculty would be focused on the idea of fostering expert knowledge and skill in assessment and diagnosis. My suggestions are an attempt to improve the education and clinical skills of dental students to make them better clinical experts in the

area of pain and dysfunction, as well as management of any of the complex conditions seen in oral medicine, including pain.

The approach that is advocated in this article is directed, however, beyond just the assessment process, and encompasses other key elements of patient care, including (1) assessment, (2) diagnosis, (3) problem planning, (4) management and treatment, and (5) follow-up and monitoring.

A few brief comments related to these topics are in order. Assessment is not the same as diagnosis. Assessment is the process of making observations from all possible perspectives and leads to a diagnosis only when the person making the assessments has the training and skill to evaluate the outcome of the assessment and determine that a condition or series of conditions is likely to be present. Likewise, management and treatment are often not the same. It is certainly possible to treat a condition without managing the underlying problem well. The concept of management goes much further than treatment alone. For example, treatment of a tobacco-related oral lesion could include excision, but no enlightened practitioner would consider excision alone as the appropriate method of patient management. They would include other activities as essential in patient management, including counseling the patient about the risks of smoking, explanations of the risks of lesion recurrence, prescription of agents to assist in smoking cessation, and exploration of behavioral factors critical in causing tobacco use to continue.

Similarly, chronic and recurrent pain is an ideal topic for education of students in the broader area of comprehensive patient management. Pain management encompasses more than most other areas of clinical problem management. Pain management requires students to engage in a very detailed analysis of the patient, leading to a diagnosis and sculpting of a plan of care that addresses physical, neurophysiological, behavioral, and functional contributors to the problem. Because pain so often manifests itself without specific structural findings, it is the perfect topic area for integration of behavioral symptoms into the diagnostic process. Pain assessment and diagnosis collectively represent a model for neurosensory complaint management in dental practice.

Some of the concepts that are proposed here begin with patient assessment. Essentially we would extend the Axis II component of the Research Diagnostic Criteria for TMD (RDC/TMD)<sup>2</sup> to all disorders and conditions. Under the system suggested, those responsible for assessment, diagnosis, oral medicine, general

medicine, pharmacotherapeutics, and orofacial pain would prepare a patient assessment curriculum, including didactic and clinical training, that covers each aspect of patient assessment critical to their subspecialty. For instance, the part of the assessment curriculum directed toward identification of patient complaints would include symptoms representative of disorders that have a structural manifestation (eg, tumor, infection), as well as those that are without known structural configurations (eg, hypertension, neuropathy, atypical forms of facial pain, and manifestations of behavioral and psychophysiological illness). The curriculum in physical assessment and function would include, as part of the general head and neck assessment, detailed didactic and clinical training in neurologic and neurophysiologic assessment, temporomandibular joint assessment using a standardized approach such as the RDC/TMD, and functional assessment methods.

Since behavioral assessment is such a potent part of the assessment of any patient, particularly those with persistent pain, other neurosensory and neuromotor disorders, and chronic disease, the faculty with specialty interest in pain could make sure that appropriate behavioral assessment tools and methods are integrated into the diagnosis and assessment curriculum. The inclusion of training in the use of such behavioral and mental assessment tools as the Mini-Mental State Examination, the Symptom Checklist-90 (SCL-90), or other psychological and mental status diagnostic instruments is equally as critical in dental training as pulp testing or assessment of occlusion. It is interesting to note that the detailed presentation of these suggested topics in the curriculum is often seen as specialized, elective, and of importance only when the student confronts the “crazy” or chronic pain patient.

Integration of these diagnostic methods as part of routine teaching in patient assessment would help to improve student understanding and appreciation of the need to conduct some form of status assessment of all patients, even those who present for routine dental care. Unless behaviorally related questions are asked and the assessments completed, the practitioner has little or no knowledge of the mental or behavioral status of the patient. In addition to the assessment of mental or behavioral status as a conceptual matrix for integration of diagnostic components, one can take each and every potential arena of diagnostic assessment and ask the question of whether to, and how to, integrate the area into mainline training in diagnostic assessment and non-surgical management. In most dental schools, the number of faculty charged with

teaching diagnosis, oral medicine, pharmacotherapeutics, and orofacial pain is not large, but the combined resources within these areas are large, and potentially larger, than the teaching resources of most traditional dental departments that cover smaller but more traditional areas (eg, endodontics, periodontics).

### Shared Assessment and Diagnosis

The specific areas of assessment and diagnosis that could benefit from an integrated approach between oral medicine and orofacial pain include, but are not limited to, the following:

- Interview
- Review of symptoms and systems
- Medical and dental history
- Psychosocial history, including family history, social and psychiatric history, substance abuse, physical abuse, and level of psychosocial function
- Medication history, including addictions, dependency, and adverse drug reactions
- General physical assessment, including vital signs, peripheral neurologic assessment, and structural assessment
- Behavioral and mental status assessment, including mini-mental status assessment
- Head and neck assessment: structural assessment of all tissues and structures, including mucosa, muscles, joints, etc; functional assessment of all tissues, including movement, sounds, palpation, neurologic evaluation, and special tests such as diagnostic blocks and pulp testing; assessment utilizing imaging (dental radiographs, head and neck radiographs, dynamic imaging such as magnetic resonance imaging and bone scans)
- Laboratory assessment, including blood studies, and others related to discovery of conditions that manifest primarily as painful conditions
- Identification and listing of problems that are identified from any of the assessment processes, whether or not they are directly related to the chief reason for dental evaluation
- Identification of appropriate consultations needed to resolve the diagnosis of the problem identified, including psychological assessments, psychiatric evaluations, neurologic referral, and referral to those with special skills in otolaryngology, gastrointestinal, and musculoskeletal pathophysiology
- Protocols for follow-up of problems to determine whether the diagnosis and a plan of care are appropriate

Currently, most students are taught general principles of patient assessment and learn about special areas of assessment within the curriculum of that area. If the special area of curriculum is of interest to the student or is particularly well taught, the impact of the special curriculum topic can be positive. If the curricular area (facial pain, oral medicine, etc) is seen to be unimportant or uninteresting, the student routinely discounts the topic or sees it as a discussion of an esoteric discipline. Making these topics an essential component of routine patient assessment, and teaching them within the general curriculum rather than as part of a specialized field, could improve student understanding and interest. In the ideal curriculum, those teaching oral medicine and orofacial pain would join with those teaching patient assessment and diagnosis to create a single diagnostic curriculum staffed by all 3 areas. Under such circumstances, the curriculum assigned to pain or oral medicine would not include diagnostic or assessment processes but would rely upon the core diagnostic curriculum and reference it when appropriate.

### Shared Management

The next curricular topic to address is management. Management implies treatment, which in orofacial pain includes physical medicine, psychologic management, and pharmacotherapeutics. Pharmacotherapeutics is a major topic frequently housed partly within oral medicine. Whether alone or integrated, it needs to be collaboratively included within the educational consortium that is being proposed here. Since management of many of the problems encountered in oral medicine and in orofacial pain requires skills in prescribing medications, pharmacotherapeutics needs to be addressed more broadly than now occurs in many dental schools. Often the topics emphasized are limited to the use of antibiotics, anesthetics, analgesics, and a few common medications frequently taken by dental patients for medical reasons. Faculty in oral medicine and orofacial pain need to work closely with faculty in pharmacotherapeutics to ensure that the extremely broad array of medications used to manage chronic pain, mucosal disease, and neurosensory and neuromotor disorders is taught in an integrated fashion. Consider for a moment that management of chronic head and neck pain potentially requires use of 1 or more of the following: opioids, non-steroidal anti-inflammatory drugs, sedatives, muscle relaxants, anxiolytics, antidepressants, anti-seizure agents, beta blockers, vasoactive medications, neuroleptics, and

others. Within oral medicine, these agents and others are also advocated in the management of neurosensory and other complaints. The complex nature of these agents and their potential for systemic effects strongly suggest the value of an integration of the topic of therapeutics in oral medicine and orofacial pain. The potential positive and negative impact of pharmacotherapeutics on behavior and behavioral management of mucosal disease, neurosensory disorders, and orofacial pain provides fuel for the argument that those teaching oral medicine, orofacial pain, behavioral medicine, and therapeutics should collaborate in a more unified didactic and clinical curriculum.

Behavioral therapies should be important treatment and management tools in acute and chronic facial pain. In general, most of the attention to such behavioral therapies has been devoted to the management of fear and anxiety in phobic patients. Behavioral therapies, however, have widespread application in many types of orofacial conditions, whether painful, such as in burning mouth syndrome (which is frequently thought to arise secondary to mucosal or metabolic disease), or in the management of chronic mucosal disease. Cognitive-behavioral therapy is important in both oral medicine and orofacial pain, because many of the conditions addressed are strongly influenced by mental status and psychosocial behavior. Cognitive-behavioral management of chronic stress, depression, anxiety, and somatization should be applied to most chronic conditions, whether manifested primarily as painful conditions, as neurosensory disorders, or as chronic mucosal disease.

Behavioral treatments focusing on adaptation, coping, and self-management (eg, imagery, meditation, self-hypnosis) are of significant potential value across all of these illnesses. Chronic pain and oral conditions that are the result of lifestyle choices benefit equally from application of therapies used in behavioral medicine. Integration of the teaching of these patient management skills under a unified approach would strengthen appreciation of behavioral therapies in dentistry.

In most schools, curricula that address diagnosis and patient management in internal medicine and oral medicine are separated from orofacial pain. It is proposed that a stronger link between these topic areas relative to patient management be established. For example, it seems wise to consider all neurologic diseases and disorders under a common topic area, whether the major presentation is neuromotor, neurosensory, or pain. The same is true for any metabolic or systemic disease that

manifests with pain or sensory change. Teaching by those individuals expert in the underlying condition together with experts in pain management offers an integrated approach useful in primary care dental practice. Two examples of conditions that would benefit from integration of the curriculum follow.

Burning mouth syndrome, an orofacial neurosensory disorder, affects over 2 million adults in North America; thus it is a rather common condition that requires a variety of management strategies, including monitoring of hematologic and metabolic status. The principal manifestations of the problem are pain and other neurosensory complaints, but the physiologic process may include invasive fungal or microbial organisms or metabolic, immune, autoimmune, or nutritional dysfunctions. The discussion of management of these conditions within the curriculum should include monitoring strategies, use of laboratory studies to determine metabolic stability, and assessment of changes in behavioral status in determining treatment success. Discussions of management often need to go beyond prescription of appropriate medications or vitamins, and should include management of the long-term impact of the problem on coping abilities or mood.

The second example is TMD. Some TMD patients experience joint pain and dysfunction as their major symptom. Their diagnosis can include systemic diseases such as lupus or rheumatoid arthritis. Clearly, discussions about management could benefit from the inclusion of specialists in oral medicine and in orofacial pain, since both groups have expert knowledge of the condition but frequently from different perspectives. Where management in TMD addresses control of metabolic and immune dysfunction, it should include discussions of the use of potent systemic agents such as prednisone, methotrexate, and other immunomodulating medications. These medications often require careful physical and systemic monitoring through the use of laboratory tests. In addition, they can cause oral and systemic side effects that require monitoring and/or secondary therapy, including the use of topical or systemic agents to reverse side effects.

Normally, the curriculum in oral medicine covers such problems,<sup>3,4,5</sup> but integrated teaching of these management topics could result in the development of an interdisciplinary team and teaching program that improves student understanding of the management of painful orofacial conditions and of chronic mucosal disease.

It is useful to remember that while dentists are better educated than ever, the amount of curriculum devoted to topic areas within oral medicine, orofacial pain, and behavioral medicine (other than fear and anxiety) have not increased markedly in the past 40 years as a percentage of the total dental curriculum. Traditional topic areas continue to control and direct the attention of dental students, graduate students, and practitioners. Most recent efforts at revision of the dental curriculum have addressed more the mechanisms of teaching (problem-based, evidence-based) than the content or integration of curriculum topics.

## Conclusions

The fields of oral medicine and orofacial pain are complex, but they are also highly related. Those active in the 2 fields are committed to a broad approach in patient care. A fusion of their interests and the development of a strong and aggressive collaborative relationship can help the fields and improve the quality of both the educational process and patient care. While it is widely complained that the dental curriculum is too diverse and covers an exhausting array of topics, it can also be argued that it is entirely too narrow and not nearly broad or diverse enough when one considers the complexity of human biology and the human spirit. We need to diversify the dental curriculum and the clinical experience of our students, while integrating curriculum and patient care issues by banding together. As collaborators unified by a broad interest, we can dramatically improve the scope of dental education, particularly training in orofacial pain and oral medicine, to the significant benefit of the patients we serve.

## References

1. Sessle BJ. Integration of basic sciences into the predoctoral curriculum to study temporomandibular disorders and orofacial pain. *J Orofac Pain* 2002;16:181-184.
2. Dworkin SF, LeResche L. Research diagnostic criteria for temporomandibular disorders. *J Craniomandib Disord Facial Oral Pain* 1992;6:301-355.
3. Millard D, Mason D (eds). *First World Workshop in Oral Medicine*. Ann Arbor, MI: Year Book Medical Publishers, 1988.
4. Millard D, Mason D (eds). *Second World Workshop in Oral Medicine*. Ann Arbor, MI: University of Michigan Continuing Education, 1993.
5. Millard D, Mason D (eds). *Third World Workshop in Oral Medicine*. Ann Arbor, MI: University of Michigan Continuing Education, 1998.