



# Clinical Update

Naval Postgraduate Dental School  
National Naval Dental Center  
8901 Wisconsin Ave  
Bethesda, Maryland 20889-5602

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## Characteristics and demographics of an orofacial pain population: review of 255 consecutive cases

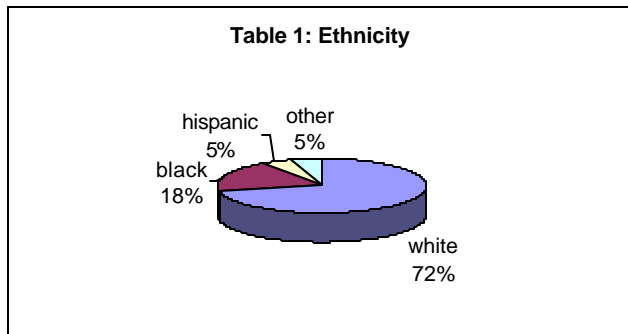
Lieutenant Commander Istvan A. Hargitai, DC, USN and Captain Peter M. Bertrand, DC, USN

### Introduction

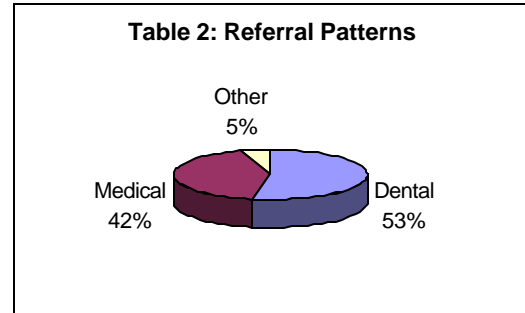
This update characterizes 255 consecutive new patients tracked in a resident's logbook from July 2002 through April 2004 and discusses clinical implications. All patients were seen in the Orofacial Pain Center, located at the National Naval Dental Center, Bethesda, Maryland. Orofacial Pain refers to the differential diagnosis and management of pain and dysfunction affecting motor and sensory functions of the trigeminal system. This area of practice has evolved beyond dentistry's focus on temporomandibular disorders (TMD) as mounting evidence has indicated that most patients have symptoms in addition to masticatory pain. Greater than 81%<sup>1</sup> and 88%<sup>2</sup> of facial pain patients reporting to specialty centers have pain in multiple body locations. Orofacial pain practitioners routinely evaluate patients plagued by a variety of head, neck, shoulder, back and systemic conditions that affect the trigeminal system and influence the expression of facial pain chief complaints. A unique blend of knowledge and skills is required to help orofacial pain patients who frequently "fall between the cracks" of dental and medical practices.

### Demographics

Patients were self-described as 72% Caucasian, 18% African-American, 5% Hispanic, and 5% other. Females represented 170 (66.6%) of the 255 patients. The mean age for all patients was 39.5 years (range: 10-81).



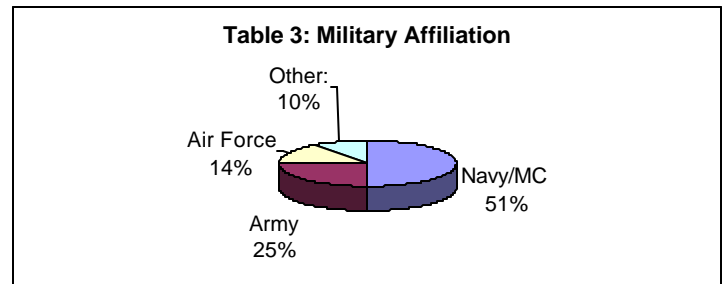
Sources of new patient referrals were 53% by dentists, 42% by physicians and 5% were recommended by friends or family members. Many dental referrals actually originated from physicians who did not know how to access the Orofacial Pain Center. To address this problem, access to the Bethesda Orofacial Pain Service will be available via the CHCS Consult Order option in the summer of 2004.



Of the 135 dental referrals, general dentists generated 65%, oral surgeons 19%, and orthodontists 7%. The remaining 9% of dental referrals came from endodontics, prosthodontics, oral medicine, pedodontics and periodontics.

For the 107 medical referrals, 56% were from primary care (either family practice or internal medicine) and 28% were from otolaryngology. Neurology, rheumatology, psychology, psychiatry, oncology, orthopedics, anesthesia, pediatrics, physical medicine and speech pathology were the sources of the other 16%.

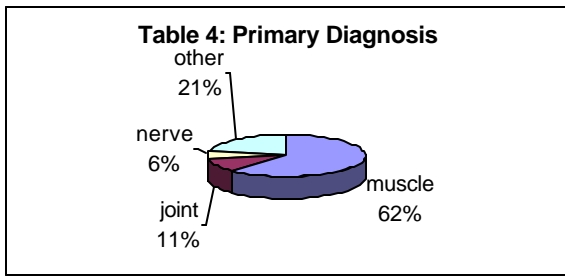
By service affiliations, 51% were Navy and Marine beneficiaries, 25% Army, 14% Air Force and 10% came from the Public Health Service, Coast Guard or NATO. Active duty represented 46% of new patients, family members 43%, and retirees 11%. Four patients were medical evacuations (2 Air Force, 1 Navy, 1 USMC).



### Primary diagnostic categories

Most patients (79%) presented with three primary diagnoses: 62% had head and neck muscular pain, 11% had intracapsular temporomandibular joint (TMJ) disorders, and 6% had neuropathic pain. The remaining 21% of patients had primary diagnoses designated as headache, dystonia, ear infection, tinnitus, salivary gland pathology, vertigo, fibromyalgia and non-painful malocclusion. The overwhelming majority of patients had multiple co-existing symptoms. For instance, 48% had ear pain with no evident ear pathology, compelling the referring provider to label "TMJ" as the problem.

Twenty-one patients (8%) presented with a confusing combination of muscular and intracapsular pain that could not be differentiated by history and physical exam. These 21 patients received a lidocaine 2% without epinephrine block of the auricular temporal nerve (ATN), which provides 60% to 90% of the innervation to the TMJ. The diagnosis was considered primarily intracapsular when the ATN block eliminated pain.



#### TMD, co-morbid conditions and ANS-HPA disturbances as etiology

Conditions co-morbid with TMD include sleep disorders, headache, gastroesophageal reflux disease (GERD), irritable bowel syndrome (IBS), fibromyalgia, chronic fatigue syndrome, multiple chemical sensitivities, panic disorder, depression, anxiety, non-cardiac chest pain and cognitive deficits. Despite rapidly emerging evidence that illustrates the pathophysiology for diagnoses that co-exist with TMD, most health professionals continue to classify such complaints as “functional somatic disorders.” Attributing co-morbid conditions to somatization (no organic bases exist for symptoms) conveys a psychogenic stigma, which instills a sense of self-blame, raises anxiety, and perpetuates the disturbed physiology that characterizes pain complaints.

Only 8% of the 255 patient cohort had an incident of gross macrotrauma that could be defined as cause of the pain complaint. Examples of such trauma included orthognathic surgery, dental procedures, occlusal appliance therapy, extractions, head blows, motor vehicle accidents, a helicopter crash, and a gunshot wound. Five of the 16 neuropathic pain patients developed pain following orthognathic surgery or dental procedures.

Eleven patients (4.3%) were musicians who developed pain complaints in normal appearing facial tissues. Such pain problems may evolve when repetitive strain elaborates sufficient fatigue input to produce pain and impaired function. The lack of isolated traumatic injuries in this cohort (92% of the patients including musicians with repetitive strain) agrees with the rich literature that suggests that orofacial pain and co-morbid conditions evolve because of the effects of sustained stress.

Although 18 to 20% of the general population is victimized by abuse, 40 to 70% of chronic pain patients have been subjected to physical or sexual abuse.<sup>4</sup> Yet only 10% of the 255 patients revealed abusive incidents during history and examination. This shows the reluctance of patients to reveal past experiences that, by stress neurochemistry, facilitate brain controlled vigilant behaviors. Metabolic fatigue input from persistent vigilant behaviors can diminish the brain’s capacity to successfully modulate pain and impair efficacy of autonomic nervous system - hypothalamic pituitary adrenal (ANS-HPA) interactions. Such behaviors are largely unrecognized by both patients and providers even after pain develops. They represent initiating and perpetuating factors that can affect the constellation of co-morbid conditions evident in chronic pain patients.

A recent prospective study conducted at the Orofacial Pain Center demonstrated that self report of TMD and co-morbid conditions differentiates pain patients from patients seeking annual dental exams.<sup>2</sup> Science increasingly indicates that co-morbid conditions evolve as chronic stress adversely affects how the brain processes stimuli and facilitates behaviors mediated by cranial nerves. Physical Self Regulation (PSR), pioneered by the Navy and University of Kentucky, teaches patients to recognize and control irrelevant use of brain controlled behaviors. Controlling such behaviors reduces barrages of fatigue into the brain through the trigeminal system. A randomized clinical trial published in 2001 showed that PSR more effectively improves TMD and measures of somatization than traditional dental therapies.<sup>3</sup>

#### Management considerations

Dentists have traditionally used 4 modalities to manage TMD complaints; splints, trigger point injections, TMJ surgery and occlusal adjustment. These modalities were infrequently used in this 255 patient cohort. Only 29 patients (11.3%) received a splint and only 10 patients (4%) received trigger point injections even though 62% were diagnosed as having primary muscle pain. Only 3 patients (1.1%) needed a TMJ surgical intervention (2 had arthrocentesis and 1 had arthroscopy) even though 28 patients (11%) were judged to have primary intracapsular problems. No patients received an occlusal adjustment. The minimal use of splints, injections and surgery in this cohort illustrates that targeting disturbed stress physiology reduces the need to use modalities which do not target pain etiology.

PSR, the Center’s baseline approach to pain management, enables control of stress-induced activities such as tooth contact, tongue protrusion, neck stabilization for sensory input collection, and the transition from diaphragmatic to thoracic/cervical breathing. These behaviors are essential responses in acute stress situations. But when unnecessarily overused, such irrelevant cranial nerve and respiratory motor activity barrages the brain with metabolic impulses that are conveyed on pain fibers. Whether due to metabolic barrage or tissue damage, persistent pain distorts sleep, depletes endogenous pain modulation capacity, impairs brain and muscle perfusion, alters muscle histology, over-loads joints and dysregulates the ANS-HPA.

Historically, dentistry has focused on TMJ anatomical change as relevant to TMD complaints. However, more than 33% of pain free subjects have disc displacements, and greater than 70% of patients with painful disc displacements will be pain free in 18 months without any intervention.<sup>5</sup> Although “TMJ” pain was the primary chief complaint for a majority of the patients, only 28 patients had confirmed primary intracapsular pain. This cohort shows that control of behaviors that impede synovial fluid diffusion and impair vascular perfusion improved patient outcomes while reducing dependence on therapies that do not address why joints get overloaded, why muscles get sore or why headaches develop.

PSR reduces over-activation of the sympathetic response, reduces TMD symptoms and may help multiple co-morbid conditions. Concurrently, sleep facilitation is vital for pain management. Adjunctive pharmacology most utilized in this cohort were medications that calmed central sympathetic tone, thereby inducing sleep and inhibiting cranial nerve muscle activity. However, drug therapy does not teach recognition of stress-induced behaviors. Combining PSR with pharmacology that lowers sympathetic tone may be superior to using PSR or drugs as isolated therapies. PSR includes Proprioceptive Awareness Training (PAT) and volitional diaphragmatic control of breathing when major limb muscles are not needed for behavior. PAT reduces fatigue by teaching interception of jaw, tongue, and neck reflexes and postural torque. The diaphragm is the most aerobically efficient muscle in the body. Its use for breathing enables efficient brain and peripheral perfusion, and reduces sympathetic activity that inhibits sleep and facilitates parafunction. Untreated orofacial pain patients maintain thoracic/cervical breathing styles during behaviors where diaphragmatic control would be vastly more efficient.

#### Concluding remarks

Orofacial pain patients seldom present with only TMD complaints. Modern orofacial pain practice targets the disturbed physiology common to multiple dental and medical problems that co-exist in patients. PSR and judicious use of modalities and pharmacology may provide symptom relief for conditions that have been thought to be outside the practice of dentistry. Future clinical updates from the Orofacial Pain Center will discuss how to integrate PSR with pharmacology, sleep hygiene strategies and nutritional considerations, and describe the financial impact of orofacial pain on the military health care system.

**References:**

1. Turp JC, Kowalski CJ, O'Leary N, Stohler CS. Pain maps from facial pain patients indicate a broad pain geography. *J Dent Res.* 1998 Jun;77(6):1465-72
2. Mazzeo N, Colburn SW, Ehrlich AD, Johnson JF, Maye JP, Schmidt J, Hargitai IA, Carlson CR, Bertrand PM. Co-morbid diagnosis, sleep, pain and psychometric inventories comparing dental populations. (in preparation for publication)
3. Carlson CR, Bertrand PM, Ehrlich DA, Maxwell AW, Burton RG. Physical self-regulation training for the management of temporomandibular disorders. *J Orofac Pain.* 2001 Winter;15(1):47-55.
4. Curran SL, Sherman JJ, Cunningham LL, Okeson JP, Reid KI and Carlson CR. Physical and sexual abuse among orofacial pain patients: Linkages with pain and psychologic distress. *J Orofac Pain.* 1995 Fall;9(4):340-6.
5. Katzberg RW, Westesson P, Tallents RH, Drake CM. Anatomic disorders of the temporomandibular joint disc in asymptomatic subjects. *J Oral Maxillofac Surg.* 1996 Feb;54(2):147-53; discussion 153-5.

Dr. Hargitai is a fellow of the Orofacial Pain Department. Dr. Bertrand is Chairman of the Orofacial Pain Department at the Naval Postgraduate Dental School.

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