

\$4 Billion Spent Annually on TMD: An Opportunity for Chiropractic

Dennis P. Steigerwald, DC

The [National Institutes of Health \(NIH\)](#) and the [National Institute of Dental and Craniofacial Research \(NIDCR\)](#) estimate that [\\$4 billion is spent every year](#) on the diagnosis and treatment of temporomandibular joint dysfunction (TMJD), also known as temporomandibular joint disorders (TMD). A [subclassification of musculoskeletal conditions, research into the etiology, pathomechanics and pathophysiology](#) of TMD has been extensive.¹⁻¹⁰ It's interesting to note that research into TMD closely parallels investigation of the dysfunctional and symptomatic intervertebral joint motion segment. The curious thing is that while chiropractors are extensively trained in the diagnosis and treatment of musculoskeletal conditions, chiropractic management of TMD amounts to a very small percentage of that \$4 billion. That is a shame.

Here is a quote taken directly from the [TMD awareness brochure](#) put out by the NIH: "Because there is no certified specialty for TMJ disorders in either dentistry or medicine, finding the right care can be difficult. Look for a health care provider who understands musculoskeletal disorders (affecting muscle, bone and joints) and who is trained in treating pain conditions. Pain clinics in hospitals and universities are often a good source of advice, particularly when pain continues over time and interferes with daily life. Complex cases, often marked by prolonged, persistent and severe pain; jaw dysfunction; co-existing conditions; and diminished quality of life, likely require a team of experts from various fields, such as neurology, rheumatology, pain management and others, to diagnose and treat this condition."

There are any number of reasons why chiropractors are not mentioned in this brochure when they *should* be featured in any or all of these capacities: diagnosticians, treating physicians and, with appropriate training, treatment team members or even case managers for complex cases. This situation can be rectified.

TMD Second Only to Low Back Pain

Dentists recognized long ago that [TMD patients are plentiful](#) (5-15 percent of the U.S. population, according to NIDCR studies) and seek treatment frequently. The aggressive movement by dentists into this field has led to the misconception that TMD is a dental disorder. Over time it has actually come to be assumed that TMD originates from malocclusion and/or stress-mediated parafunctional habits (e.g., bruxism). While this theory has been disproved numerous times, the bulk of the money is spent on dental treatments for TMD, despite the fact that dental alteration of the occlusion and/or orthodontic treatment have [proven to be ineffective](#) treatments.¹¹⁻¹⁵

This is not to say that dentists do not have an important place on the treatment team. They can function as point-of-entry diagnosticians and providers of initial home-care instructions. Dentists with specialized training can also provide oral orthotic therapy and chronic pain/medication management to complement the physiotherapy, hands-on therapy and nutritional advice given by the chiropractor. As it stands today however, chiropractic is glaringly absent in this equation. As a result, patients don't get the best care and chiropractors miss out on this market.

This unfortunate situation will only change if chiropractors learn to look for, accurately diagnose, refer and, if they choose, treat TMD. This would result in a huge increase in chiropractic patient visits and more effective treatment (e.g., home care, manipulation, spinal care, pathology-/location-specific physiotherapy, trigger-point and cranial therapy, nutritional counseling).^{8, 16}

Accurate TMD diagnosis will also result in more effective treatment for patients who suffer from resistant neck pain and headache, as these symptoms and signs (e.g., cervical muscle hypertonicity) can be misdiagnosed as cervicogenic. They can, in fact, be driven by inflammation and/or disturbed biomechanics of the temporomandibular joints (TMJ). Symptoms frequently produced by an inflamed/dysfunctional TMJ include neck and upper shoulder muscle pain/hypertonicity (this is not referred pain), headaches, ear pain, dizziness and tinnitus.^{7, 17} As these symptoms are not included in the NIH cost estimate (which only factored in local TMJ and orofacial pain/dysfunction), the societal impact of TMD is clearly more than the \$4 billion estimate.

TMD and the Chiropractic Paradigm

The reason that TMD frequently produces such wide-ranging symptoms is quite straightforward. TMJ are paired synovial joints containing a rich neurology that profoundly impacts the trigeminal-cervical complex.¹⁸⁻²¹ Inflammation, tissue damage and/or biomechanical disturbance can lead to aberrant neural discharge and CNS facilitation.^{20, 22} The symptoms of this neural activity frequently express themselves far from their origin in these joints.

There is no paradigm shift here. This is [basic chiropractic theory](#): Disturbed joint function results in disturbed neural function, which results in both local and peripheral symptoms.²³ The temporomandibular joints happen to be unique in that their neurology is far richer in mechanoreceptors than nociceptors, and mechanoreceptor sensitization can lead to CNS facilitation.^{21, 24} As a result, the predominant symptoms of many problematic TMD cases are peripheral to TMJ and the orofacial region.^{7, 22, 25}

Head posture influences TMJ biomechanics, and whiplash injuries are known to alter head posture via cervical/spinal injury and to simultaneously damage the TMJ.²⁶⁻³⁵ Chiropractors who serve as primary care physicians for whiplash patients should include a rule-out examination protocol for temporomandibular joint disorders. Direct participation in the specific care of any diagnosed TMD is also an excellent option.

In any case, all health care professionals should be encouraged to refer whiplash patients to chiropractors trained in TMD. Just think what it could mean to your practice if TMD referrals from other health professionals opened the door for you to show these doctors and their patients the benefits of chiropractic care!

Positioning Your Practice

There are a few simple tests that need to be added to the clinical work-up if chiropractors want to expand their reach into the world of TMD diagnosis and treatment. These tests include: TMJ range of motion; palpation of the TMJ and masticatory muscles; tracking of mandibular movement; and auscultation of the TMJ during mandibular movement. While TMD specialists may also include joint/muscle challenges, radiographic studies and special tests (e.g., MRI), almost any dentist suspecting a TMD will perform and record the results of these tests. Chiropractors should perform these tests routinely as well.

These tests will add no more than five minutes to your examination. The time spent learning the language, examination procedures and diagnostic workup will pay for itself many times over. Here's why: Satisfied patients refer, you can advertise a new service, and professional referrals from dentists and others are available to those who speak the TMD language. The door to this huge (\$4 billion) market is open, and our profession should walk in and make a difference.

References

1. Pullinger AG, Seligman DA. [TMJ osteoarthritis: a differentiation of diagnostic subgroups by symptom history and demographics](#). *J Craniomandib Disord*, 1987;1(4):251-6.
2. Pullinger AG. History and Pathology of Internal Derangements. In: *Diagnostic and Surgical Arthroscopy of the Temporomandibular Joint*. Sanders B, Murakami K, Clark GT, eds. Philadelphia: WB Saunders, 1989:164-5.
3. Brnton JG, Sessle BJ. Reflex excitation of masticatory muscles induced by algescic chemicals applied to the temporomandibular joint of the cat. *Arch Oral Biol*, 1988;33:741-7.
4. Zuniga C, Miralles R, Mena B, et al. [Influence of variation in jaw posture on sternocleidomastoid and trapezius electromyographic activity](#). *Cranio*, 1995;13(3):157-62.
5. Glaros AG, Glass EG, Hayden W. [History and treatment received by patients with TMD: a preliminary investigation](#). *J Orofac Pain*, 1995;9(2):147-51.
6. Helms CA, Katzberg RW, Dolwick MT. *Internal Derangements of the Temporomandibular Joints*. Radiology Research and Education Foundation, 1983.
7. Steigerwald DP, Verne S, Young D. [A retrospective evaluation of the impact of temporomandibular joint arthroscopy on the symptoms of headache, neck pain, shoulder pain, dizziness and tinnitus](#). *Cranio*, 1996;14(1):46-54.
8. Steigerwald DP, Croft A. *Whiplash and Temporomandibular Disorders: An Interdisciplinary Approach to Case Management*. San Diego: Keiser Publishing, 1992.
9. Storey AT. Neurophysiology. In: *The Temporomandibular Joint: A Biological Basis for Clinical Practice*. Sarnat BG, Laskin DM, Eds. Philadelphia: WB Saunders, 1992.
10. Yemm R. Pathophysiology of the Masticatory Muscles. In: *The Temporomandibular Joint: A Biological Basis for Clinical Practice*. Sarnat BG, Laskin DM, Eds. Philadelphia: WB Saunders, 1992.
11. DeLaat A, Van Steenberghe D, Lesaffre E. [Occlusal relationships and TMJ dysfunction. Part II. Correlation between occlusal and articular parameters and symptoms of TMJ dysfunction by means of stepwise logistic regression](#). *J Prosthet Dent*, 1986;55:116-21.
12. Pullinger AG, Seligman DA. [The role of intercuspal relationships in TMD: a review](#). *J Craniomandib Disord*, 1991;5:96-105.
13. Pullinger AG, Monteiro AA. [History factors associated with symptoms of temporomandibular disorders](#). *J Oral Rehab*, 1988;16:117-24.
14. Pullinger AG, Seligman DA. [The degree to which attrition characterizes differentiated patient groups of temporomandibular disorders](#). *J Orofac Pain*, 1993;7:196-208.
15. Seligman DA, Pullinger AG. The role of intercuspal occlusal relationships in temporomandibular disorders: a review. Critique. *J Craniomandib Disord*, 1991;5(2):96-106.
16. Travell J, Simons D. *Myofascial Pain and Dysfunction: The Trigger-Point Manual*. Baltimore: Williams & Wilkins, 1983.
17. Goldman JR. Soft Tissue Trauma. In: *Temporomandibular Disorders: Diagnosis and Treatment*. Kaplan AS, Assael LA, Eds. Philadelphia: WB Saunders, 1991:190-223.
18. Arvidsson J, Pfaller K. [Central projections of C4-C8 dorsal root ganglia in the rat studied by anterograde transport of WGA-HRP](#). *J Comp Neurol*, 1990;292:349-62.
19. Bogduk N. Innervation and Pain Patterns of the Cervical Spine. In: *Physical Therapy of the Cervical and Thoracic Spine*. Grant D, Ed. New York: Churchill Livingstone, 1994:69.
20. Brnton JG, Hu JW, Sessle BJ. Effects of temporomandibular joint stimulation on nociceptive and non-nociceptive neurons of the cat's trigeminal subnucleus caudalis (medullary dorsal horn). *J Neurophysiol*, 1988;59:1575-89.
21. Griffin CJ, Harris R. [Innervation of the temporomandibular joint](#). *Aust Dent J*, 1975;20:78-85.

22. Mosby EL. Efficiency of temporomandibular joint arthroscopy: a retrospective study. *J Oral Maxillofac Surg*, 1993;51:17-21.
23. Danzig W, May S, McNeill C, Miller A. [Effect of an anesthetic injected into the temporomandibular joint space in patients with TMD.](#) *J Craniomandib Disord*, 1992;6(4):288-95.
24. Mahan PE, Alling CC. *Facial Pain, 3rd edition*. Philadelphia: Lea & Febiger 1991:204.
25. Vallerand WP, Hall NIB. Improvement in myofascial pain and headaches following TMJ surgery. *J Craniomandib Disord*, 1991;5(3):197-204.
26. Pullinger AG. History and Pathology of Internal Derangements. *Op cit*, pp. 178-9.
27. Braun BL, DiGiovanna A, Schiffman E, et al. A cross-sectional study of temporomandibular joint dysfunction in post-cervical trauma patients. *J Craniomandib Disord*, 1992;6(1):24-31.
28. Burgess J. [Symptom characteristics in TMD patients reporting blunt trauma and/or whiplash injury.](#) *J Craniomandib Disord*, 1991;5(4):251-7.
29. Croft AC. Cervical acceleration/deceleration trauma: a reappraisal of physical and biomechanical events. *J Neuromusculoskel Syst*, 1993;1(2):45-51.
30. Epstein JB. [Temporomandibular disorder, facial pain and headache following motor vehicle accidents.](#) *J Can Dent Assoc*, 1992;58(6):488-95.
31. Harkins SJ, Marteney JL. [Extrinsic trauma: a significant precipitating factor in temporomandibular dysfunction.](#) *J Prosthet Dent*, 1985;54:271-2.
32. Kronn E. [The incidence of TMJ dysfunction in patients who have suffered a cervical whiplash injury following a traffic accident.](#) *J Orofac Pain*, 1993;7(2):209-13.
33. Lader E. [Cervical trauma as a factor in the development of TMJ dysfunction and facial pain.](#) *Cranio*, 1983; 1:86-90.
34. Steigerwald DP. Acceleration-deceleration injury as a precipitating cause of temporomandibular joint dysfunction. *J Chiro*, November 1989;26(11):61-4.
35. Weinberg S, LaPointe H. [Cervical extension-flexion injury and internal derangement of the TM joint.](#) *J Oral Maxillofac Surg*, 1987;45:654-6.

APRIL 2009