



## TMJ News Bites

Issue 5 2019

### The Fall Giving Season is Upon Us

The TMJ Association (TMJA) is the only nonprofit patient advocacy organization fighting for the best science that will lead to a greater understanding of Temporomandibular and related disorders (TMD), as well as safe and effective treatments. **We cannot change the face of TMJ without YOU!**



If you are an **employee of a government agency** who understands the full impact of TMD on individuals, their loved ones and society at large, please help us by designating **The TMJ Association** as your **Combined Federal Campaign (CFC) charity #12102**. Ask your **mail carrier and those you know serving in the military** to consider pledging their support to The TMJ Association. If they don't already have a chosen charity, they may be glad to help!

**State employees** in *California, Connecticut, New Jersey, New York, Ohio, Pennsylvania, Washington and Wisconsin* can also contribute through the State Employee Contribution Campaign by writing The TMJ Association on the donor form.

**United Way** and **other nonprofit corporate donor programs** are great ways to improve the plight of TMD patients. Simply write The TMJ Association on your donor form.

If you don't participate in any of these campaigns, you can still help by [donating directly to The TMJ Association!](#)



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### You, Your Esophagus and TMD

By Joan Wilentz, TMJA Board Member and Science Writer

The esophagus is a roughly ten-inch hollow tube that descends from your throat through

the diaphragm into the stomach. Normally, it is a one-way street transporting food you swallow to the stomach for digestion. But in GERD— Gastroesophageal Reflux Disease — the flow can reverse so that stomach contents (including gastric acids) are regurgitated upwards to cause a burning sensation (heartburn), nausea, pain and other distressing symptoms. Now, American and Chinese investigators who conducted a study in two hospitals in China, have concluded that having GERD is a risk factor for temporomandibular disorders (TMD), so if you have GERD the odds are greater that you will have TMD and vice versa: if you have GERD, the odds are better than even that you will have TMD.

We paid attention to this study, published in the *Canadian Medical Association Journal* (<http://www.cmaj.ca/content/191/33/E909.long>) because it is a large one, rigorously conducted, and uses the classic case-control method to compare two groups: one with chronic TMD; the other a control group without TMD, but otherwise matched by age, sex, and other variables. The investigators' aim was to discover if there were significant differences between the TMD group and controls who also had a diagnosis of GERD.

**The Rigor:** The TMD group consisted of 1,522 consecutive patients between the ages of 18 and 70 diagnosed with chronic TMD who were seen at two sites in China, one an academic (research-and- professional training-oriented) hospital, the other a non-academic hospital. The control group were 1,522 non-TMD individuals seeking dental services at the two hospitals. Dentists used the same criteria to diagnose chronic TMD in the Chinese patients as was used in the U.S.-based OPPERA (Orofacial Pain Prospective Evaluation and Risk Assessment) study that we have reported on in previous *TMJ News Bites*. (Criteria include at least 6 months duration of joint or masticatory muscle pain for selected numbers of hours per month). The diagnosis of GERD was made by trained gastroenterologists using a standard protocol and blinded as to whether they were examining a TMD patient or a control subject. The researchers found GERD in 132 TMD patients and 61 controls, a significant difference interpreted as an increase in the odds of having TMD if you have GERD—and vice versa: if you have TMD, you are at increased risk of having GERD.

**WHY?** It's not clear why these two diseases are connected, and certainly in a case-control association study of this kind it is not possible to say that one condition like GERD *causes* TMD or vice versa, but the investigators also explored data from a number of psychological questionnaires and interviews with participants and came up with some overlapping issues. Patients with GERD and patients with TMD both reported disturbed sleep; both also reported higher degrees of anxiety and some measure of “somatization,” in which psychological feelings like anxiety or depression are projected into physical symptoms, affecting a body part or system. So they have added to their conclusions that anxiety, undermined sleep and somatization may “moderately mediate the relation” between GERD and TMD.

It seems to us that those psychological issues may be present in a number of chronic illnesses, especially ones involving pain, so we question how important they may be in mediating the connection between GERD and TMD. We wonder if changes in diet by TMD patients caused by problems with chewing and swallowing may be a factor in creating gastrointestinal problems. On the other hand, as the authors point out, the presence of GERD and frequent regurgitation of acidic stomach contents may act as an

irritant sensitizing the central nervous system and pain pathways resulting in a decline in pain thresholds in the oral region. As with most scientific research, results of one study often lead to more questions to be answered. In any case, **the real messages of the study are for patients and caregivers to be aware of the gastrointestinal implications for patients with TMD—and vice versa and the evidence of the complexity of TMD and the need for multidisciplinary research and treatment in TMD.**

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## Cervical Muscle Tenderness in Temporomandibular Disorders and Its Associations with Diagnosis, Disease-Related Outcomes, and Comorbid Pain Conditions

*The evidence is mounting for the inclusion of medical disciplines into TMD diagnostics and treatment. Many patients we hear from have cervical pain in addition to other issues in the cervical spine and upper back/shoulders and are being treated by [physiatrists](#) (medical doctors who treat a wide variety of medical conditions affecting the brain, spinal cord, nerves, bones, joints, ligaments, muscles, and tendons) or spine specialists. The abstract below acknowledges the involvement of the cervical area in TMD.*

### Abstract

**AIMS:** To analyze cervical tenderness scores (CTS) in patients with various temporomandibular disorders (TMD) and in controls and to examine associations of CTS with demographic and clinical parameters.

**METHODS:** This case-control study included 192 TMD patients and 99 controls diagnosed based on a questionnaire and a clinical examination following the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) guidelines. CTS, adapted from the widely used total tenderness score, was the mean sum of the palpation scores from the suboccipital, sternocleidomastoid, and trapezius muscles. Depending on the variables, data were analyzed using Pearson chi-square, analysis of variance, t test, Bonferroni post hoc adjustment, and/or multivariate linear regression analyses.

**RESULTS:** CTS was higher in TMD compared to controls ( $P < .001$ ). Across TMD subgroups, CTS was notable only in those with a myogenous TMD diagnosis, but not in arthrogenous TMD ( $P = .014$ ). CTS was positively associated with: female sex ( $P = .03$ ), whiplash history, higher verbal pain scores, comorbid headaches, body pain, increased pain on mouth opening, and higher masticatory muscles tenderness scores (MTS) ( $P < .001$  for all). Sex ( $P < .001$ ), MTS ( $P < .001$ ), comorbid headache ( $P = .042$ ), and pain on opening (mild:  $P = .031$ ; moderate:  $P = .022$ ) retained significant associations with CTS in the multivariate analysis, and these main effects were influenced by interactions with whiplash history and comorbid body pain.

**CONCLUSION:** CTS differentiated between TMD patients and controls and between TMD diagnoses. Specific patient and pain characteristics associated with poor outcome in terms of CTS included effects of interactions between myogenous TMD, female sex, whiplash history, comorbid body pain and headaches, and pain on opening. **It can**

therefore be concluded that routine clinical examination of TMD patients should include assessment of the cervical region.

Source: <https://europepmc.org/abstract/med/31465035>

Almoznino G , Zini A , Zakuto A , Zlutzky H , Bekker S , Shay B , Haviv Y , Sharav Y , Benoliel R , [Journal of Oral & Facial Pain and Headache](#) [27 Aug 2019]  
Type: Journal Article DOI: 10.11607/ofph.2374

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## Drug Induced Bruxism

*The authors of this article state that orofacial movement disorders (bruxism) are treated typically by dental professionals and not by those specialists (neurologists) researching and treating the [other movement disorders](#) (Parkinson's disease, Huntington's disease, tremors, etc.). Again, this is more evidence of the complexity of TMD and the need for multidisciplinary research and treatment in TMD.*

Bruxism is defined as 'a repetitive jaw-muscle activity characterised by clenching or grinding of the teeth, or bracing or thrusting of the mandible'. Bruxism occurs in adults and children, with a systematic review reporting an incidence of 18.6% in adults. Orofacial consequences include jaw-muscle hypertrophy, tooth wear and crack development, fractures of tooth restorations and pain associated with the teeth and surrounding musculature.

Bruxism is an under-recognised adverse drug reaction particularly associated with use of antipsychotics and selective serotonin reuptake inhibitors. A recent systematic review of case reports found it was most commonly reported with fluoxetine, venlafaxine and sertraline. The median time for symptom onset is 3–4 weeks although it may occur even after a few doses. The frequency appears to be dose-dependent and symptoms usually take 3–4 weeks to resolve with drug cessation. Antipsychotics are also associated with bruxism due to their inhibitory effect on dopamine-2 receptors.

While the movement disorder tardive dyskinesia was mentioned in the article and the orofacial manifestations were alluded to, it is important to highlight that orobuccolingual dyskinesias (i.e. involving the face, mandible, lips and tongue) are often the first manifestation and the most common form of tardive dyskinesia. They usually present as lip-smacking, grimacing, rapid eye blinking and dyskinetic tongue movements such as protrusion and tongue rolling. In addition, they can also appear after medium- to long-term treatment with antipsychotic medicines, with a latency of up to 1–2 years.

Clinical and registered indications for antidepressants and antipsychotics have expanded over recent years to include conditions such as anxiety, mania, behavioural disturbances of dementia and autism. It is therefore likely that the incidence of these orofacial drug-induced movement disorders will increase as these medicines are prescribed more frequently across a wider patient age range.

Orofacial manifestations of drug-induced movement disorders are significant adverse effects which can affect both quality of life and medication adherence. Raising awareness of this often-overlooked adverse effect is therefore essential.

The study authors thanked Stephen Duma and Victor Fung for their comprehensive article on drug-induced movement disorders. While the review is thorough, the adverse effect of drug-induced bruxism has been omitted.

Stephen Duma and Victor Fung, the authors of the article, comment: Bruxism, as well as related symptoms of jaw pain and headache, are relatively common yet often under-recognised adverse drug reactions. **They were not mentioned in our article because we focused on drug-induced movement disorders that are typically referred to movement disorders specialists. While temporomandibular joint-related symptoms including bruxism are also encountered and sometimes managed by movement disorders specialists, they are usually initially referred to other specialists, including dentists, orthodontists, ear, nose and throat specialists, oromaxillofacial and other oral health specialists.**

Source: [Teoh L, Moses G. Drug-induced bruxism. Aust Prescr. 2019;42\(4\):121. doi:10.18773/austprescr.2019.048](#)

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## Fibromyalgia Linked to Gut Bacteria for First Time

*Fibromyalgia is a condition found to be comorbid with TMD, therefore we thought this article would be of interest. [Article Source: McGill University Health Centre](#)*

Scientists have found a correlation between a disease involving chronic pain and alterations in the gut microbiome.

Fibromyalgia affects 2-4 percent of the population and has no known cure. Symptoms include fatigue, impaired sleep and cognitive difficulties, but the disease is most clearly characterized by widespread chronic pain. In a paper published today in the journal *Pain*, a Montreal-based research team has shown, for the first time, that there are alterations in the bacteria in the gastrointestinal tracts of people with fibromyalgia. Approximately 20 different species of bacteria were found in either greater or lesser quantities in the microbiomes of participants suffering from the disease than in the healthy control group.

### **Greater presence or absence of certain species of bacteria**

“We used a range of techniques, including Artificial Intelligence, to confirm that the changes we saw in the microbiomes of fibromyalgia patients were not caused by factors such as diet, medication, physical activity, age, and so on, which are known to affect the microbiome,” says Dr. Amir Minerbi, from the Alan Edwards Pain Management Unit at the McGill University Health Centre (MUHC), and first author on the paper. The team also included researchers from McGill University and Université de Montréal as well as others from the Research Institute of the MUHC.

Dr. Minerbi adds, “We found that fibromyalgia and the symptoms of fibromyalgia – pain, fatigue and cognitive difficulties - contribute more than any of the other factors to the variations we see in the microbiomes of those with the disease. We also saw that the severity of a patient’s symptoms was directly correlated with an increased presence or a

more pronounced absence of certain bacteria – something which has never been reported before.”

### **Are bacteria simply the markers of the disease?**

At this point, it's not clear whether the changes in gut bacteria seen in patients with fibromyalgia are simply markers of the disease or whether they play a role in causing it. Because the disease involves a cluster of symptoms, and not simply pain, the next step in the research will be to investigate whether there are similar changes in the gut microbiome in other conditions involving chronic pain, such as lower back pain, headaches and neuropathic pain.

The researchers are also interested in exploring whether bacteria play a causal role in the development of pain and fibromyalgia. And whether their presence could, eventually, help in finding a cure, as well as speed up the process of diagnosis.

### **Confirming a diagnosis and next steps towards finding a cure**

Fibromyalgia is a disease that has proved difficult to diagnose. Patients can wait as long as 4 to 5 years to get a final diagnosis. But this may be about to change.

“We sorted through large amounts of data, identifying 19 species that were either increased or decreased in individuals with fibromyalgia,” says Emmanuel Gonzalez, from the Canadian Center for Computational Genomics and the Department of Human Genetics at McGill University. “By using machine learning, our computer was able to make a diagnosis of fibromyalgia, based only on the composition of the microbiome, with an accuracy of 87 per cent. As we build on this first discovery with more research, we hope to improve upon this accuracy, potentially creating a step-change in diagnosis.”

“People with fibromyalgia suffer not only from the symptoms of their disease but also from the difficulty of family, friends and medical teams to comprehend their symptoms,” says Yoram Shir, the senior author on the paper who is the Director of the Alan Edwards Pain Management Unit at the MUHC and an Associate Investigator from the BRaiN Program of the RI-MUHC. “As pain physicians, we are frustrated by our inability to help, and this frustration is a good fuel for research. This is the first evidence, at least in humans, that the microbiome could have an effect on diffuse pain, and we really need new ways to look at chronic pain.”

### **How the research was done**

The research was based on a cohort of 156 individuals in the Montreal area, 77 of whom suffer from fibromyalgia. Participants in the study were interviewed and gave stool, blood, saliva and urine samples, which were then compared with those of healthy control subjects, some of whom lived in the same house as the fibromyalgia patients or were their parents, offspring or siblings.

The researchers' next steps will be to see whether they get similar results in another cohort, perhaps in a different part of the world, and to do studies in animals to discover whether changes in bacteria play a role in the development of the disease.

**Reference:** [Minerbi, A., Gonzalez, E., Brereton, N. J. B., Anjarkouchian, A., Dewar, K., Fitzcharles, M.-A., ... Shir, Y. \(2019\). Altered microbiome composition in individuals with fibromyalgia. PAIN, Articles in Press. https://doi.org/10.1097/j.pain.0000000000001640](https://doi.org/10.1097/j.pain.0000000000001640)

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## Letter to the Editor

We received the following e-mail in response to an article in the last issue of *TMJ News Bites* and wanted to share Tricia's comments with our readers.

Were you ever told your pain was all because of stress? We would love to hear your experiences on this topic as well. Send us your comments to [info@tmj.org](mailto:info@tmj.org).

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Dear TMJA:

This paragraph, from the research cited in the article *Predicting Pain that Persists* in the [last issue of \*TMJ News Bites\*](#) felt like total vindication to me.

*“While an earlier study showed that psychosocial factors such as pre-existing stress and negative mood predicted first onset of TMD, the researchers were surprised to find that these measures did not predict chronic painful TMD. Psychosocial distress may continue at the same level before and after TMD onset, so it may not offer any additional predictive value for chronic TMD, the authors suggest.”*

From the very beginning of my descent into TMJ hell, starting with increased pain a few months after my Vitek surgery, I've been told that I was over stressed and if I could handle stress better, my pain would go away.

I was sent to psychotherapy, learned biofeedback and meditation all to lower my stress levels, and yet my pain never improved. In fact, it got worse, because while the doctor was dismissing my symptoms as something under my control, my jaw bone was rotting away from that miserable implant that he promised would “fix everything.” This is the same doctor who disappeared in the dark of night and established a new practice and never even left a list of patient names from the Vitek surgeries he did at his former place of practice.

I find it interesting that even the researchers were surprised that stress was not an indicator of long term jaw pain. Why were they so surprised? Was it because mostly women deal with TMD issues, and did they go into this with the familiar prejudice against women and medical issues (as has happened with heart attacks)?

Tricia

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others who understand what  
you're going through!**

- The TMJ Association, Ltd.

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## **CME on Chronic Overlapping Pain Conditions**

The Chronic Pain Research Alliance, an initiative of The TMJ Association, in partnership with the International Pelvic Pain Society, is pleased to announce the release of our newly developed Continuing Medical Education (CME) program on Chronic Overlapping Pain Conditions (COPCs) titled, "[A Biopsychosocial Approach to the Clinical Management of Chronic Overlapping Pain Conditions.](#)"

This activity - hosted by the International Association for the Study of Pain (IASP) - is designated for 1 AMA PRA Category 1 Credit. If you are not a current IASP member (or do not have IASP login credentials), please follow the instructions below to access the course free of charge by registering as a non-member. To access the program, visit: <https://www.pathlms.com/iasp/courses/11652>.

If you are interested in obtaining a copy of the course's PowerPoint slide set and corresponding slide notes for teaching purposes, please contact CPRA's Director, Christin Veasley by email ([cveasley@cpralliance.org](mailto:cveasley@cpralliance.org)).

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## **NIH Funding Opportunities**

### **Basic and Clinical Research**

In an effort to promote greater understanding of TMD and to develop safe and effective

evidence-based diagnostics and treatments, The TMJ Association promotes and encourages basic and clinical research on Temporomandibular Disorders. [Click here to view the latest National Institutes of Health \(NIH\) funding opportunities for scientists interested in advancing TMJ research.](#) The following NIH research opportunities are currently available:

## New Funding Opportunities

- Limited Competition: Dental, Oral and Craniofacial Tissue Regeneration Consortium (U24 Clinical Trial Not Allowed)
- Request for Information (RFI): Identification of Potentially High Value Biomarkers for Predicting Acute to Chronic Pain Transition and Resilience
- Achieving Tissue Robustness Through Harnessing Immune System Plasticity (R21)(R01)
- HEAL Initiative: Translational Development of Devices to Treat Pain (U18)
- HEAL Initiative: Translational Devices to Treat Pain (UG3/UH3)
- HEAL Initiative Translational Devices to Treat Pain (U44I)
- HEAL Initiative: Clinical Devices to Treat Pain (UH3)
- HEAL Initiative: Stimulating Peripheral Activity to Relieve Conditions (SPARC): Anatomical and Functional Mapping of Pain-Related Visceral Organ Neural Circuitry (U01)
- Mechanisms, Models, Measurement, and Management in Pain Research (R01) (R21)
- Global Brain and Nervous System Disorders Research Across the Lifespan (R21)
- NIDCR Small Research Grants for Data Analysis and Statistical Methodology Applied to Genome-wide Data (R03)
- Mechanisms Underlying the Contribution of Sleep Disturbances to Pain (R01) (R21)
- Research on the Health of Women of Understudied, Underrepresented and Underreported (U3) Populations an ORWH FY19 Administrative Supplement

## Additional Funding Opportunities

- Research on Chronic Overlapping Pain Conditions (R01)(R21)
- Analytical and/or Clinical Validation of a Candidate Biomarker for Pain (R61/R33)
- Clinical Validation of Candidate Biomarkers for Neurological Diseases (U01)
- Discover and Validation of Novel Targets for Safe and Effective Pain Treatment (R01)(R21)
- Factors Underlying Differences in Female and Male Presentation for Dental, Oral, and Craniofacial Diseases and Conditions (R01) (R21)
- NIDCR Small Research Grants for Secondary Analysis of FaceBase Data (R03)
- Tailoring Dental Treatment for Individuals with Systemic Diseases that Compromise Oral Health (R01) (R21)
- Blueprint Neurotherapeutics Network (BPN): Small Molecule Drug Discovery and Development for Disorders of the Nervous System (UH2/UH3) (U44)
- Population Health Interventions: Integrating Individual and Group Level Evidence (R01)
- Family-Centered Self-Management of Chronic Conditions (R21) (R01)
- mHealth Tools for Individuals with Chronic Conditions to Promote Effective Patient-Provider Communication, Adherence to Treatment and Self-Management (R01) (R21)
- The Biomarkers Consortium
- Blueprint Neurotherapeutic Network Applications Directed at Small Molecule Drug Discovery and Development of Disorders of the Nervous System

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## Educational Publications



## E-Newsletters

### *TMJ News Bites*

[Read Past issues of TMJ News Bites](#) available on our website.

If you're not currently receiving TMJ News Bites and would like to [be on our mailing list, sign up here.](#)

### ***Cutting Edge - COPCs Research Advances***

*Cutting Edge - COPCs Research Advances*, is an electronic newsletter published by the Chronic Pain Research Alliance, an initiative of The TMJ Association. Developed to keep the medical-scientific community abreast of recent research advances, this publication contains abstracts of recently published studies on the epidemiology, pathophysiology, and clinical management of Chronic Overlapping Pain Conditions. These conditions include temporomandibular disorders, chronic low back pain, chronic migraine and tension-type headache, endometriosis, myalgic encephalomyelitis/chronic fatigue syndrome, fibromyalgia, vulvodynia, irritable bowel syndrome, and interstitial cystitis/painful bladder syndrome.

The most current issues are now available for your review at: [http://www.cpralliance.org/New\\_Findings](http://www.cpralliance.org/New_Findings). If you would like to receive future issues of COPCs Research Advances, [click here to register.](#)



**CUTTING EDGE** a publication of **CHRONIC PAIN Research Alliance**  
COPCs Research Advances

## **TMJ Science Journal**

Our latest issue of TMJ Science, which includes the summary and recommendations from our 8th scientific meeting-How Can Precision Medicine Be Applied to Temporomandibular Disorders and

## **Chronic Overlapping Pain Conditions Brochure**

This brochure addresses Chronic Overlapping Pain Conditions (COPCs), how COPCs are diagnosed, the complexity of the chronic pain experience, and how to work with your health care provider to develop a treatment plan. It is available by [postal mail](#) or as a [PDF on our website.](#)

## **Your Guide to Temporomandibular Disorders**

This brochure, written by The TMJA, is a straightforward, easy-to-read booklet that guides patients in how to make health care decisions. It is available by [postal mail](#) or as a [PDF on our website.](#) and we encourage you to share it with your friends, health care professionals, and family members.

## **NIH Brochure on TMJ Disorders**

This brochure is produced and distributed by the National Institute of Dental and Craniofacial Research in partnership with the Office of Research on Women's Health, components of the National Institutes of Health (NIH) in Bethesda, Maryland. Part of the U.S. Department of Health and Human Services, NIH is one of the world's foremost medical research centers and the federal focal point for medical research in the United States. This booklet is available in English and Spanish at: <https://www.nidcr.nih.gov/OralHealth/Topics/TMJ/TMJDisorders.htm>.

## **Dental Care Guide**

*Temporomandibular Disorders, Dental Care and You.* The TMJ Association developed this guide to provide you with oral hygiene self-care tips that you can do at home, as

Its Comorbidities---is now available. We hope you're impressed with how far the science of Temporomandibular Disorders has come.

[We invite you to read this new publication which is available in the publication section of our website as a pdf file.](#)

well as suggestions for future dental appointments. Routine maintenance of your teeth and gums should reduce the risk of dental disease and the need for invasive dental treatments. [Click here to view on our website.](#)

## About The TMJ Association...*Changing the Face of TMJ*

The TMJ Association, Ltd. is a nonprofit, patient advocacy organization whose mission is to improve the quality of health care and lives of everyone affected by Temporomandibular Disorders (TMD). For over 30 years, we have shared reliable information on TMD with people like you. We invite you to visit our website, [www.tmj.org](http://www.tmj.org).



**The TMJ Association, Ltd., P.O. Box 26770, Milwaukee, WI 53226**

[info@tmj.org](mailto:info@tmj.org) | [www.tmj.org](http://www.tmj.org)

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