

# JAW DYSFUNCTION

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AND IT'S RELATIONSHIP WITH TINNITUS,  
DIZZINESS, POOR BALANCE AND HEADACHE

Carlo Rinaudo



THANK YOU

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Dizzy Anne  
and team



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## A LITTLE ABOUT ME...

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BMedSci (Hons) MChiro ICSSD DACNB PhD FIBFN-CND FAICE (2021)

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- ▶ Lecturer in clinical neuroscience and vestibular neuro-rehabilitation





## PLEASE NOTE - DISCLAIMER

- ▶ I'm not a dentist or orthodontist, rather share my experience as a Chiropractor who sees, manages and understand the connection between the TMJ, otological and musculoskeletal conditions
- ▶ The material presented is for general information purposes only and the sole the opinion of the speaker
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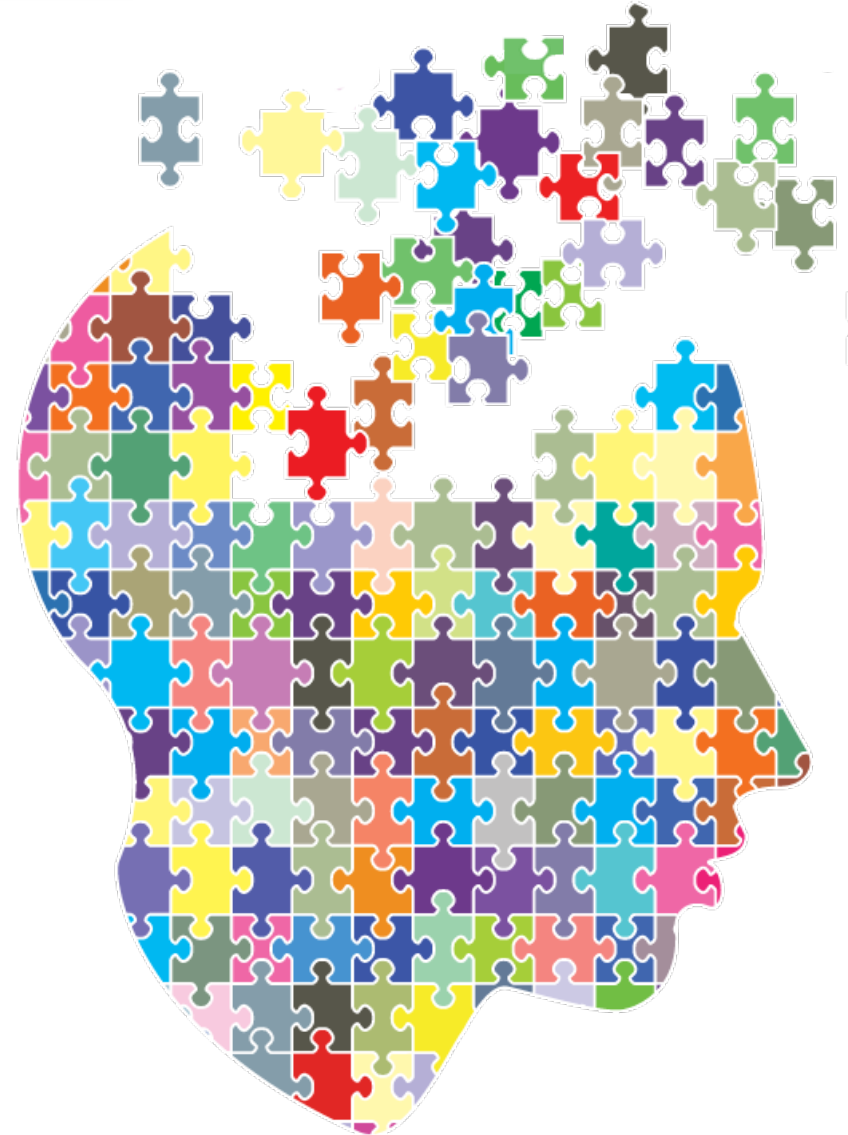






## INTENTION OF THIS TALK

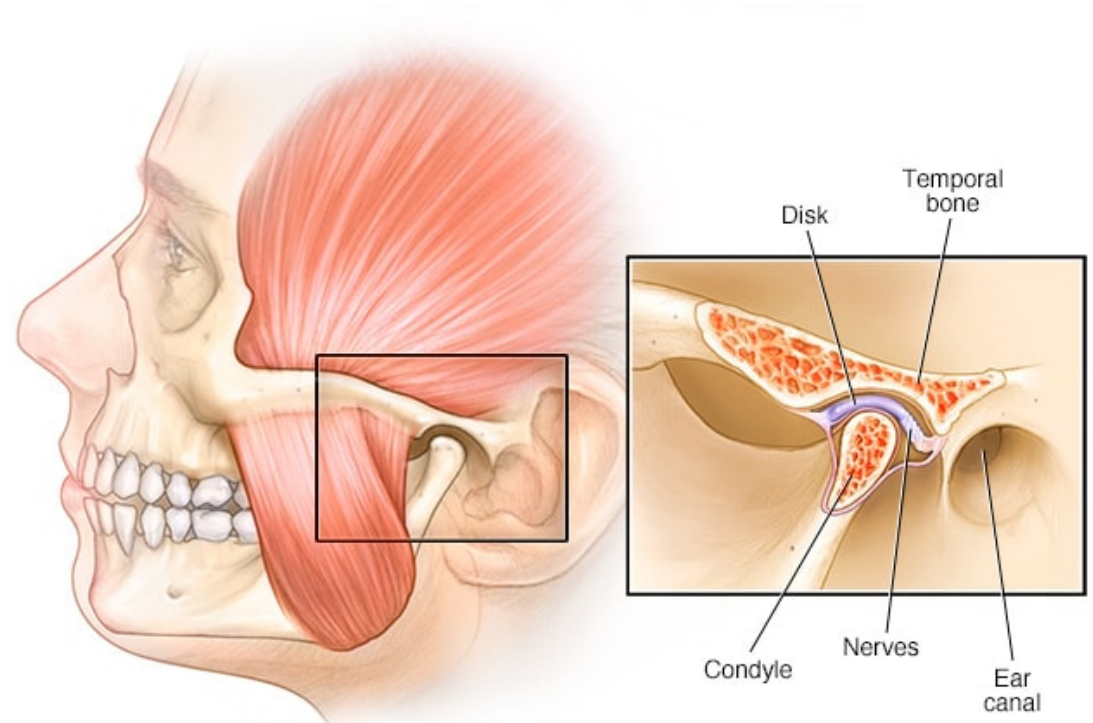
- ▶ For you to appreciate the jaw (TMJ) and its disorders (TMD) as it relates to dizziness, tinnitus, headaches and poor posture
- ▶ Open thoughts and discussion with your health care team as to whether TMD and the cervical spine may play a role in your case
- ▶ Potentially raise more questions about what is causing your specific condition, rather than answering all your questions - empowering you to think about **holistic and integrated solutions**





## WHAT IS THE TMJ - TEMPOROMANDIBULAR JOINT?

The temporomandibular joint (TMJ) is the joint that connects your mandible (lower jaw) to your skull. The joint can be found on both sides of your head in front of your ears. It allows your jaw to open and close, letting you to speak and eat



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# WHAT IS TMD - TEMPOROMANDIBULAR DISORDER?

The symptoms of TMJ disorders (TMD) depend on the severity and cause of your condition. The most common symptom of TMJ disorders is pain in the jaw and surrounding muscles.

Symptoms may show up on just one side of the face or both.

TMD can be caused by a number of different things, including:

- dental (tooth) issues — for example, if you have new fillings or dentures causing an uneven bite
- wear and tear of the joint, usually caused by osteoarthritis
- an injury
- jaw clenching and teeth grinding, which may be linked to stress
- other diseases, such as rheumatoid arthritis, fibromyalgia or gout
- injury to the jaw
- head or neck injury

## YOU MAY HAVE TMD IF YOU SUFFER FROM...

### HEAD

1. Recurring headaches
2. Head tension
3. Shooting pain up back of head
4. Scalp painful to touch

### EYES

1. Pain behind eyes
2. Bloodshot eyes
3. Sensitive to sunlight

### JAW

1. Clicking or popping
2. Grating sounds
3. Pain in cheek muscles
4. Uncontrollable jaw movements

### EARS

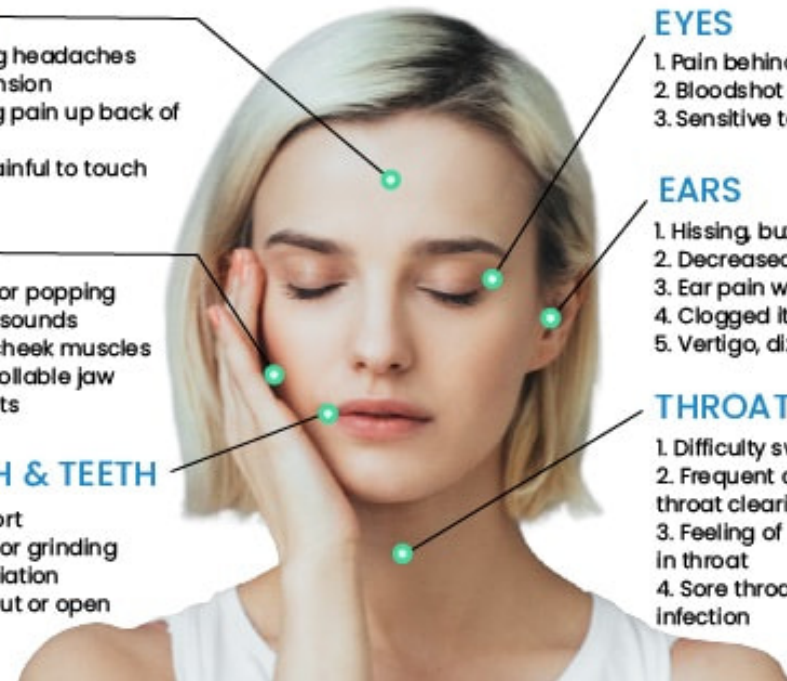
1. Hissing, buzzing, or ringing
2. Decreased hearing
3. Ear pain with no infection
4. Clogged itchy ears
5. Vertigo, dizziness

### MOUTH & TEETH

1. Discomfort
2. Bruxism or grinding
3. Jaw deviation
4. Locks shut or open

### THROAT

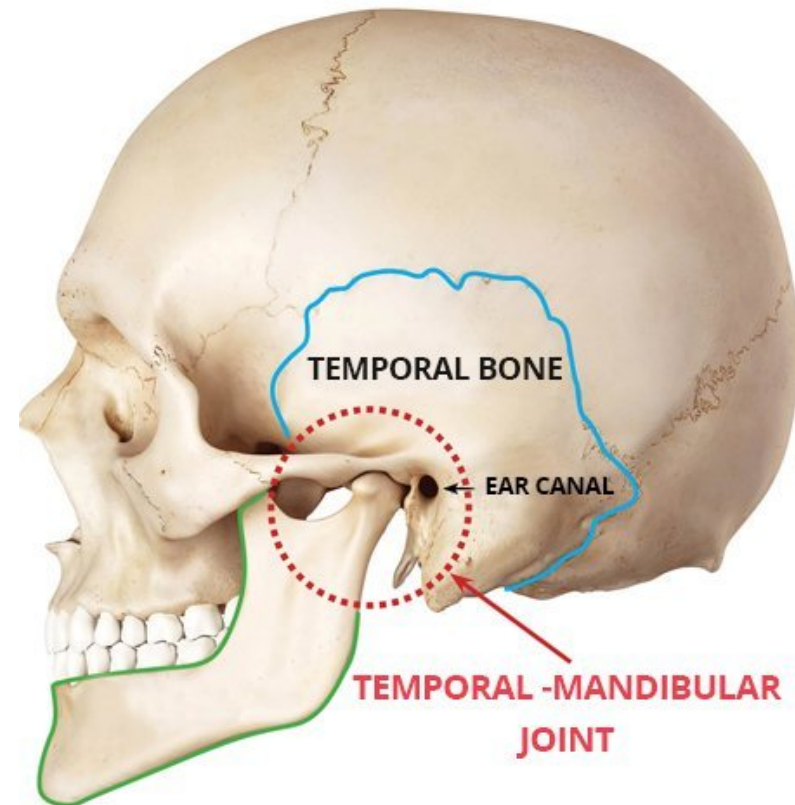
1. Difficulty swallowing
2. Frequent coughing or throat clearing
3. Feeling of foreign object in throat
4. Sore throat with no infection





## IS THERE A CONNECTION BETWEEN TMD AND OTOLOGICAL SYMPTOMS?

- ▶ Otological symptoms include
  - ▶ dizziness
  - ▶ vertigo
  - ▶ tinnitus
  - ▶ ear fullness and pain,
  - ▶ hearing changes







## Otologic Symptoms of Temporomandibular Disorder and Effect of Orofacial Myofunctional Therapy

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Cláudia Lúcia Pimenta Ferreira, M.S.; Marco Antonio M. Rodrigues Da Silva, Ph.D.

**ABSTRACT:** The aim of this study was to investigate the frequency of otologic symptoms and their relationship to orofacial signs and symptoms of temporomandibular disorder (TMD), and the effect of orofacial myofunctional therapy. The study was conducted on eight asymptomatic subjects (Group C) and 20 subjects with articular TMD, randomly distributed over two groups: one treated using orofacial myofunctional therapy (OMT Group) and a control group with TMD (Group CTMD). Patient selection was based upon the Research Diagnostic Criteria for TMD (RDC/TMD). All subjects submitted to a clinical examination with self-reporting of symptom severity, and to orofacial myofunctional and electromyographic evaluation at diagnosis and again, at the end of the study. Correlations were calculated using the Pearson test and inter- and intragroup comparisons were made ( $p < 0.05$ ). In the diagnosis phase, subjects with TMD reported earache (65%), tinnitus (60%), ear fullness (90%), and 25% of the asymptomatic subjects reported tinnitus. The otologic symptoms were correlated with tenderness to palpation of the temporomandibular muscles and joints and with orofacial symptoms. Only the OMT group showed a reduction of otologic and orofacial symptoms, of tenderness to palpation and of the asymmetric index between muscles. OMT may help with muscle coordination and a remission of TMD symptoms.

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## Prevalence of otologic complaints in patients with temporomandibular disorder

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The prevalence and rank of order of 4 otologic complaints in 200 temporomandibular disorder (TMD) patients, as well as the relationship between the complaints and TMD subgroups, were investigated and compared with an asymptomatic control group. No subjective otologic complaints were reported by 45 (22.5%) TMD patients; the remaining 155 (77.5%) patients had at least 1 otologic complaint. Otolgia, tinnitus, vertigo, and hearing loss were reported by 63.6%, 59.1%, 50%, and 36.4%, respectively, of the subjects with myofascial pain and dysfunction; by 46.1%, 44.2%, 32.5%, and 22% of the patients with internal derangement; and by 62.5%, 45.8%, 41.6%, and 20.8% of the patients with both myofascial pain and dysfunction and internal derangement. However, the incidence of otalgia (8%), tinnitus (26%), vertigo (14%), and hearing loss (14%) was found to be lower for the control group. Statistically, the control group had fewer otologic complaints. Patients in the TMD groups had high incidences of otologic complaints compared with the control subjects without TMD signs or symptoms. Aural symptoms in patients with internal derangement or myofascial pain and dysfunction, or their combination, were nonspecific. (Am J Orthod Dentofacial Orthop 2003;123:620-3)



## Temporomandibular disorders, otologic symptoms and depression levels in tinnitus patients

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**SUMMARY** The aim of this study was to determine the prevalence of signs and symptoms of temporomandibular disorders (TMD) and otologic symptoms in patients with and without tinnitus. The influence of the level of depression was also addressed. The tinnitus group was comprised of 100 patients with tinnitus, and control group was comprised of 100 individuals without tinnitus. All subjects were evaluated using the research diagnostic criteria for temporomandibular disorders (RDC/TMD) to determine the presence of TMD and depression level. Chi-square, Spearman Correlation and Mann-Whitney tests were used in statistical analysis, with

a 5% significance level. TMD signs and symptoms were detected in 85% of patients with tinnitus and in 55% of controls ( $P \leq 0.001$ ). The severity of pain and higher depression levels were positively associated with tinnitus ( $P \leq 0.001$ ). **It was concluded that tinnitus is associated with TMD and with otalgia, dizziness/vertigo, stuffy sensations, hypoacusis sensation and hyperacusis, as well as with higher depression levels.**

**KEYWORDS:** temporomandibular joint disorder, tinnitus, earache, dizziness, depression

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## Association between painful temporomandibular disorders, sleep bruxism and tinnitus

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**Abstract:** The present cross-sectional study was designed to investigate the association between sleep bruxism (SB), tinnitus and temporomandibular disorders (TMD). The sample consisted of 261 women (mean age of 37.0 years). The Research Diagnostic Criteria for Temporomandibular Disorders were used to classify TMD and self-reported tinnitus. SB was diagnosed by clinical criteria proposed by the American Academy of Sleep Medicine. The results showed an association between painful TMD and tinnitus (OR = 7.3; 95%CI = 3.50-15.39;  $p < 0.001$ ). With regard to SB, the association was of lower magnitude (OR = 1.9; 95%CI = 1.16-3.26;  $p < 0.0163$ ). When the sample was stratified by the presence of SB and painful TMD, only SB showed no association with tinnitus. The presence of painful TMD without SB was significantly associated with tinnitus (OR = 6.7; 95%CI = 2.64-17.22;  $p < 0.0001$ ). The concomitant presence of painful TMD and SB was associated with a higher degree of tinnitus severity (OR = 7.0; 95%CI = 3.00-15.89;  $p < 0.0001$ ). **It may be concluded that there is an association between SB, painful TMD and self-reported tinnitus; however, no relationship of a causal nature could be established.**

Braz Oral Res., (São Paulo) 2014;28(1):1-7



## IS THERE A LINK BETWEEN TINNITUS AND TEMPOROMANDIBULAR DISORDERS?

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**Statement of problem.** The frequent concurrence of tinnitus and temporomandibular joint and masticatory muscle disorders (TMD) has led to the assumption that a possible relationship exists between these 2 conditions.

**Purpose.** The present prospective clinical study was conducted to assess the possible association between tinnitus and TMD and to investigate the effect of stomatognathic therapy on tinnitus distress.

**Material and methods.** The prevalence of TMD and tinnitus was investigated in a consecutive series of 951 patients at the Department of Prosthetic Dentistry at the University Medical Center Regensburg, Germany. Patients with TMD and simultaneous tinnitus were included in the prospective clinical trial (n=25). Baseline examination comprised a detailed functional analysis, diagnosis of temporomandibular joint and masticatory muscle disorder, and a tinnitus questionnaire. All the participants received individual dental functional therapy (oral splints, physiotherapy). The effects of functional therapy on TMD and tinnitus symptoms were examined 3 to 5 months after the initiation of dental functional therapy. Means (standard deviations) were calculated, and 1-way ANOVA was used to investigate statistical differences ( $\alpha=.05$ ). The differences of the 2 binary outcomes were compared with the Pearson  $\chi^2$  test, and the relative risk was calculated.

**Results.** Prevalence of tinnitus was found to be 8 times higher in participants with TMD (30 of 82 [36.6%]) than in participants without TMD (38 of 869 [4.4%]). All the participants with unilateral TMD and unilateral tinnitus showed these conditions on the same side. Stomatognathic therapy improved tinnitus symptoms in 11 of 25 participants (44%).

**Conclusions.** The results of this study and the prospective clinical trial showed a significant correlation between tinnitus and TMD. The observed treatment outcome suggests that dental functional therapy may have a positive effect on TMD-related tinnitus. (J Prosthet Dent 2014;111:222-227)

### CLINICAL IMPLICATIONS

There is a correlation between tinnitus and temporomandibular disorders, and stomatognathic treatment may positively influence temporomandibular joint and masticatory muscle disorder related tinnitus. Therefore, screening for temporomandibular joint and masticatory muscle disorder symptoms in all patients with tinnitus and using temporomandibular joint and masticatory muscle disorder therapy may be appropriate.

## Painful temporomandibular disorders, self reported tinnitus, and depression are highly associated

Disfunção temporomandibular dolorosa, auto-relato de zumbido e depressão estão fortemente associados

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### ABSTRACT

**Objective:** The aim of this study was to investigate the association among painful temporomandibular disorders (TMD), self reported tinnitus, and levels of depression. **Method:** The sample consisted of 224 individuals with ages ranges from 18 to 76 years. The Research Diagnostic Criteria for Temporomandibular Disorders Axis I were used to classify TMD and Axis II were used for self reported tinnitus, and to score the levels of depression. The odds ratio (OR) with 95% confidence interval (CI) was applied. **Results:** The presence of painful TMD without tinnitus was significantly associated with moderate/severe levels of depression (OR=9.3, 95%; CI: 3.44-25.11). The concomitant presence of painful TMD and tinnitus self-report increased the magnitude of the association with moderate/severe levels of depression (OR=16.3, 95%; CI: 6.58-40.51). **Conclusion:** Painful temporomandibular disorders, high levels of depression, and self reported tinnitus are deeply associated. However, this association does not imply a causal relationship.

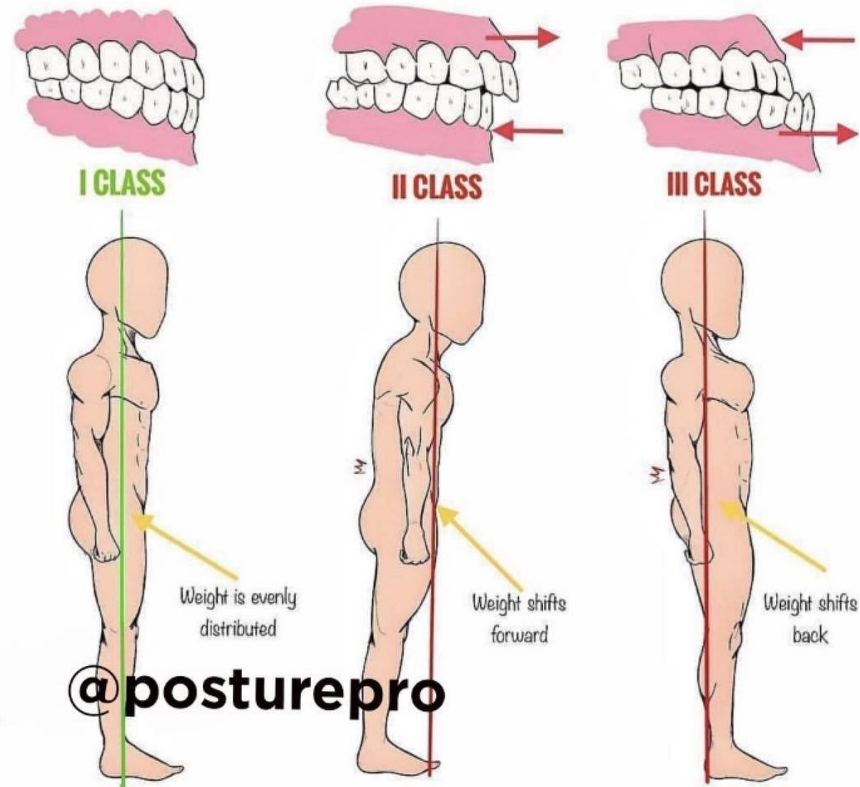
**Conclusion** "It is important for clinicians to understand this concept associated not causal) to avoid overly simplistic strategies when diagnosing and managing tinnitus, since tinnitus has been viewed as complex, multidimensional developmental processes where various physical, psychosocial and environmental factors are of the utmost importance. The interaction between otolaryngologists and dentists is strongly recommended when evaluating and managing patients suffering from chronic painful TMD and tinnitus"





# TMD AND POOR BALANCE AND POSTURE

## DENTAL OCCLUSION & BODY POSTURE







# GLOBAL BODY POSTURE AND PLANTAR PRESSURE DISTRIBUTION IN INDIVIDUALS WITH AND WITHOUT TEMPOROMANDIBULAR DISORDER: A PRELIMINARY STUDY



systematic review

BJPT Brazilian Journal of Physical Therapy

## Static body postural misalignment in individuals with temporomandibular disorders: a systematic review

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### ABSTRACT

**Objective:** The aim of this study was to evaluate body posture and the distribution of plantar pressure at physiologic rest of the mandible and during maximal intercuspal positions in subjects with and without temporomandibular disorder (TMD).

**Methods:** Fifty-one subjects were assessed by the Diagnostic Criteria for Research on Temporomandibular Disorders and divided into a symptomatic group (21) and an asymptomatic group (30). Postural analysis for both groups was conducted using photogrammetry (SAPo version 0.68; University of São Paulo, São Paulo, Brazil). The distribution of plantar pressures was evaluated by means of baropodometry (Footwork software), at physiologic rest and maximal intercuspal positions.

**Results:** Of 18 angular measurements, 3 (17%) were statistically different between the groups in photogrammetric evaluation. The symptomatic group showed more pronounced cervical distance ( $P = .0002$ ), valgus of the right calcaneus ( $P = .0122$ ), and lower pelvic tilt ( $P = .0124$ ). The baropodometry results showed the TMD subjects presented significantly higher rearfoot and lower forefoot distribution than those in the asymptomatic group. No differences were verified in maximal intercuspal position in the between-group analysis and between the 2 mandibular positions in the within-group analysis.

**Conclusions:** Subjects with and without TMD presented with global body posture misalignment. Postural changes were more pronounced in the subjects with TMD. In addition, symptomatic subjects presented with abnormal plantar pressure distribution, suggesting that TMD may have an influence on the postural system. (J Manipulative Physiol Ther 2014;37:407-414)

**Key Indexing Terms:** Temporomandibular Disorder; Posture; Photogrammetry

**ABSTRACT | Background:** The association between body postural changes and temporomandibular disorders (TMD) has been widely discussed in the literature, however, there is little evidence to support this association. **Objectives:** The aim of the present study was to conduct a systematic review to assess the evidence concerning the association between static body postural misalignment and TMD. **Method:** A search was conducted in the PubMed/Medline, Embase, Lilacs, Scielo, Cochrane, and Scopus databases including studies published in English between 1950 and March 2012. Cross-sectional, cohort, case control, and survey studies that assessed body posture in TMD patients were selected. Two reviewers performed each step independently. A methodological checklist was used to evaluate the quality of the selected articles. **Results:** Twenty studies were analyzed for their methodological quality. Only one study was classified as a moderate quality study and two were classified as strong quality studies. Among all studies considered, only 12 included craniocervical postural assessment, 2 included assessment of craniocervical and shoulder postures, and 6 included global assessment of body posture. **Conclusion:** There is strong evidence of craniocervical postural changes in myogenous TMD, moderate evidence of cervical postural misalignment in arthrogenous TMD, and no evidence of absence of craniocervical postural misalignment in mixed TMD patients or of global body postural misalignment in patients with TMD. It is important to note the poor methodological quality of the studies, particularly those regarding global body postural misalignment in TMD patients.

**Keywords:** temporomandibular disorders; body posture; craniocervical posture; systematic review.

### HOW TO CITE THIS ARTICLE

Chaves TC, Turci AM, Pinheiro CF, Sousa LM, Grossi DB. Static body postural misalignment in individuals with temporomandibular disorders: a systematic review. Braz J Phys Ther. 2014 Nov-Dec; 18(6):481-501. <http://dx.doi.org/10.1590/>



Review

## TMJ Dysfunctions Systemic Implications and Postural Assessments: A Review of Recent Literature

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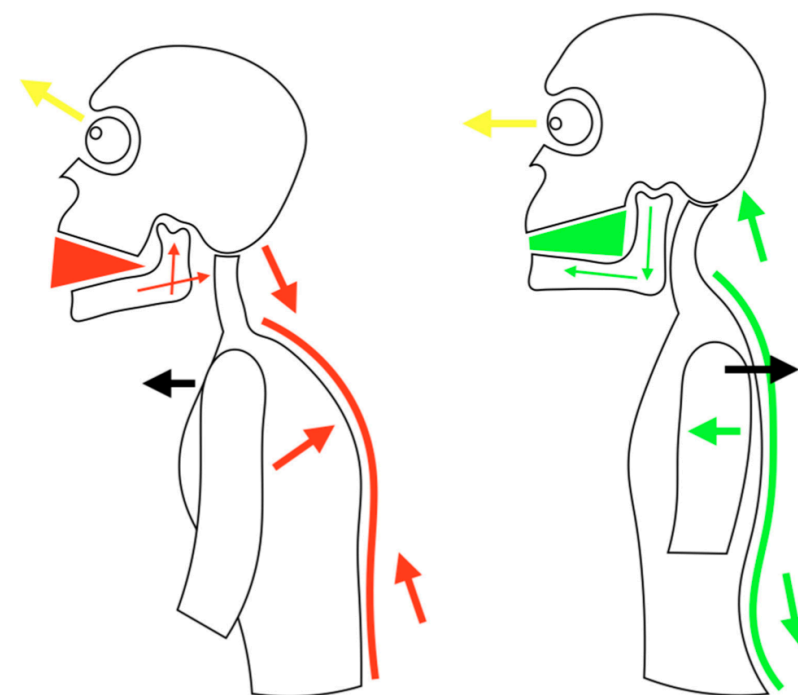
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**Abstract:** Cases of correlations between posture and the temporomandibular joint have long been reported in the literature. In particular, occlusal anomalies, and therefore malocclusion, could have negative implications for the spine. The objective of this study was to review the literature and bring to light any correlations between temporomandibular joints (TMJ) and posturology. The literature search was conducted in the PubMed and Embase scientific search engines with the aim of obtaining the most possible results in the initial search, the number of results initially obtained was 263. Subsequently, the inclusion and exclusion criteria were reduced first to 83 and subsequently to manual analysis of the articles, those included remained only 11. **The results show a correlation between anomalies of the TMJ and dysfunctions of the vertebral column.** Not all the articles considered are in agreement with each other regarding epidemiological data, but surely this study can represent an important starting point for a much more careful evaluation of the dental patient and at the same time for the request for counseling by a dentist in case of postural abnormalities.



**Figure 1.** Schematically representation of a condition of postural imbalance on the left and balance on the right. Note how mandible position is strictly related with trunk posture.



# TMD AND NECK PAIN

Kim et al. *BMC Musculoskeletal Disorders* (2019) 20:631  
https://doi.org/10.1186/s12891-019-3003-4

BMC Musculoskeletal Disorders

RESEARCH ARTICLE

Open Access



## The relationship between spinal pain and temporomandibular joint disorders in Korea: a nationwide propensity score-matched study

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### Abstract

**Background:** Patients with temporomandibular joint disorder (TMD) often complain of pain in other areas. Several studies have been conducted on spinal pain in TMD patients, but have contained only limited information. Therefore, this study analyzed the relationship between TMD and spinal pain in greater detail by using nationwide data.

**Methods:** A total of 12,375 TMD patients from the Korean National Health Insurance Review and Assessment database were analyzed. Controls were selected using propensity score-matching. The McNemar test, chi-square test, and paired t-test were used to compare the prevalence and severity of spinal pain between cases and matched controls. Logistic regression and linear regression models were used to analyze factors affecting the prevalence and severity of spinal pain in patients with TMD.

**Results:** The annual period prevalence of TMD was 1.1%. The prevalence was higher in younger individuals than in individuals of other ages and was higher in women than in men. The medical expenditure for TMD per person was \$86. Among TMD patients, 2.5% underwent surgical procedures and 0.3% were hospitalized. The prevalence of spinal pain in patients with TMD was 48%, whereas that in the control group was 34%. Increased severity of TMD was associated with an increased probability of spinal pain. The medical expenditure, mean number of visits, and lengths of treatment for spinal pain were greater for patients with TMD than for controls (\$136 vs. \$81, 4.8 days vs. 2.7 days, 5.5 days vs. 3.3 days). Higher TMD grade was associated with greater differences in average medical expenditure, number of visits, and lengths of treatment for spinal pain between cases and controls. Additionally, for women, living in a rural area and having an older age and more severe TMD were associated with a greater probability of spinal pain and higher medical expenditure related to spinal pain.

**Conclusion:** A strong association was observed between the presence of TMD and the presence of spinal pain. The association became stronger as the severity of TMD increased, indicating a positive correlation between the severity of TMD and spinal pain.

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http://dx.doi.org/10.1155/2015/512792

### Research Article

## Jaw Dysfunction Is Associated with Neck Disability and Muscle Tenderness in Subjects with and without Chronic Temporomandibular Disorders

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**Purpose.** Tender points in the neck are common in patients with temporomandibular disorders (TMD). However, the correlation among neck disability, jaw dysfunction, and muscle tenderness in subjects with TMD still needs further investigation. This study investigated the correlation among neck disability, jaw dysfunction, and muscle tenderness in subjects with and without chronic TMD. **Participants.** Forty females between 19 and 49 years old were included in this study. There were 20 healthy controls and 20 subjects who had chronic TMD and neck disability. **Methods.** Subjects completed the neck disability index and the limitations of daily functions in TMD questionnaires. Tenderness of the masticatory and cervical muscles was measured using an algometer. **Results.** The correlation between jaw disability and neck disability was significantly high ( $r = 0.915, P < 0.05$ ). The correlation between level of muscle tenderness in the masticatory and cervical muscles with jaw dysfunction and neck disability showed fair to moderate correlations ( $r = 0.32-0.65$ ). **Conclusion.** High levels of muscle tenderness in upper trapezius and temporalis muscles correlated with high levels of jaw and neck dysfunction. Moreover, high levels of neck disability correlated with high levels of jaw disability. These findings emphasize the importance of considering the neck and its structures when evaluating and treating patients with TMD.





# DO PEOPLE WITH MD EXPERIENCE TMD SYMPTOMS?

## Craniomandibular Disorders in Patients With Meniere's Disease: A Controlled Study

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*This study compares the frequency of signs and symptoms of craniomandibular disorders and dental conditions in patients diagnosed with Meniere's disease and in control subjects from a population sample. Thirty-one patients (12 men, 19 women) diagnosed with Meniere's disease were referred from three otolaryngologic clinics for clinical examination and possible treatment of craniomandibular disorders. Thirty-one control subjects were selected from the population in the same area of Sweden (Ystad). Both groups were subjected to a screening of their symptoms with a self-administered questionnaire and to a routine stomatognathic examination. The function of the masticatory system was further calculated according to the index of Helkimo for both anamnestic dysfunction ( $A_i$ ) and clinical dysfunction state ( $D_i$ ). Clinical symptoms of craniomandibular disorders such as pain in the face or jaw; pain on movement of the mandible; fatigue of the jaws; and pain located in the vertex area, the neck/shoulder area, and the temples all occurred significantly more often in the patient group. Findings at the clinical examination included a statistically higher frequency of tenderness to palpation of the masticatory muscles, the temporomandibular joint, and the upper part of the trapezius muscle in the patient group compared to that of the control group. The findings indicate a much higher prevalence of signs and symptoms of craniomandibular disorders in patients diagnosed with Meniere's disease than in the general population.*

J OROFACIAL PAIN 1996;10:28-37.





# WHAT HAS THE JAW TO DO WITH MY DIZZINESS OR TINNITUS?

## Peripheral System

- vestibular end-organs
- vestibular portion of CNVIII

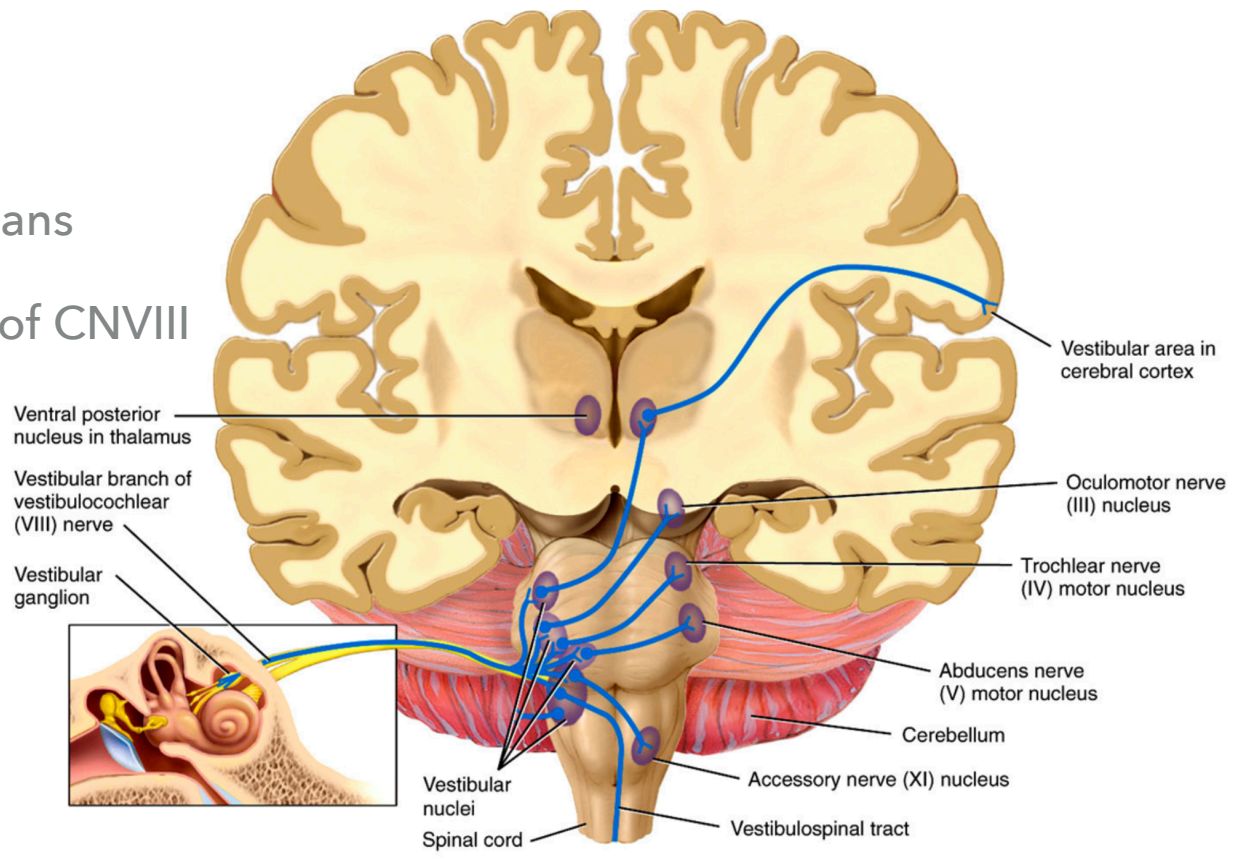


Figure 17.26 Tortora - PAP 12/e  
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## Central System

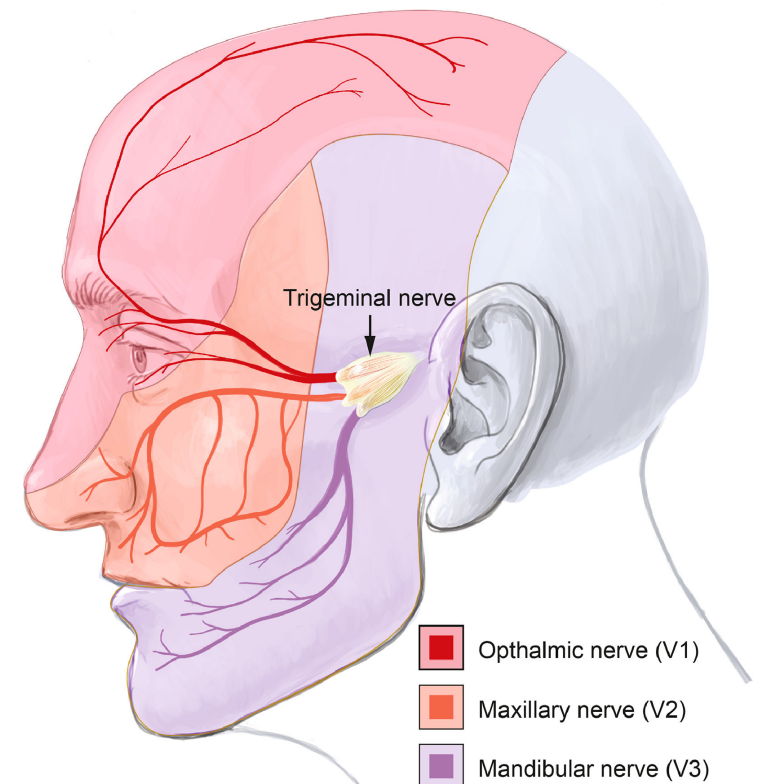
- brainstem
- cerebellum
- eye movements
- higher cortex
- autonomic
- spinal control



# TRIGEMINAL NERVE

Function (cranial nerve 5)

- ▶ chewing and eating muscles
- ▶ muscle in ear (dampen noise)
- ▶ sensory of face (pain, temperature, fine touch, dental pressure, vibration)

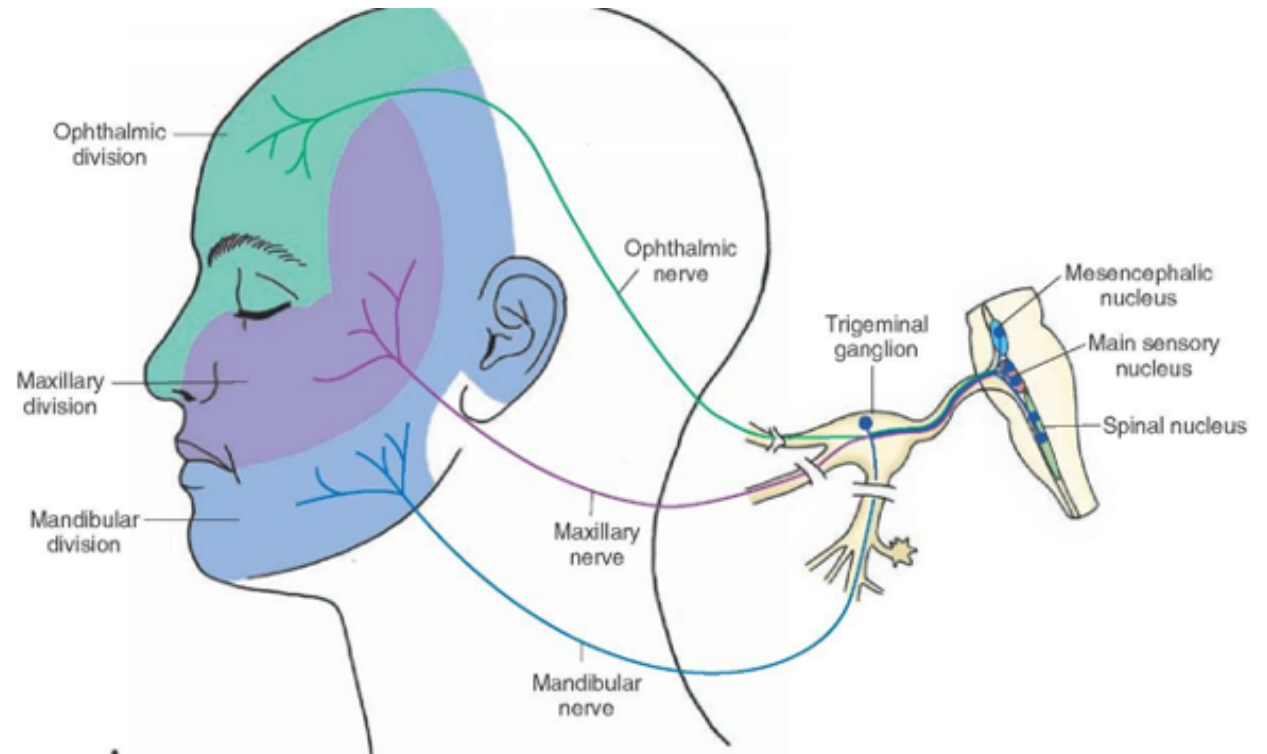




# TRIGEMINAL NERVE

Function (cranial nerve 5)

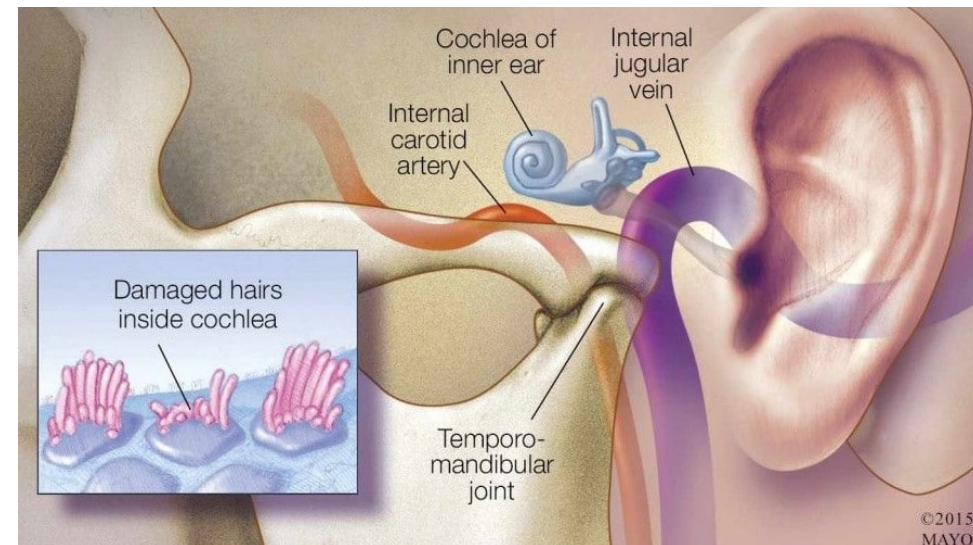
- ▶ chewing and eating muscles
- ▶ muscle in ear (dampen noise)
- ▶ sensory of face (pain, temperature, fine touch, dental pressure, vibration)





## WHAT HAS THE JAW TO DO WITH MY DIZZINESS OR TINNITUS?

- ▶ **anatomical proximity** between the temporomandibular joint, muscles innervated by the trigeminal nerve, and ear structures
- ▶ due to a nerve signal induced by auriculo temporal nerve or reduction of sensory signals
- ▶ mandibular condyle to suffer a dislocation can cause a stretching of the ossicular chain and trigger aural symptoms.
- ▶ hyperactivity of the jaw muscles can contract muscle tensor tympani (located in inner ear) resulting in symptoms ear fullness, imbalance and hearing loss



Kusdra, Pamela Maria et al. "Relationship between Otological Symptoms and TMD." The international tinnitus journal 22 1 (2018): 30-34 .



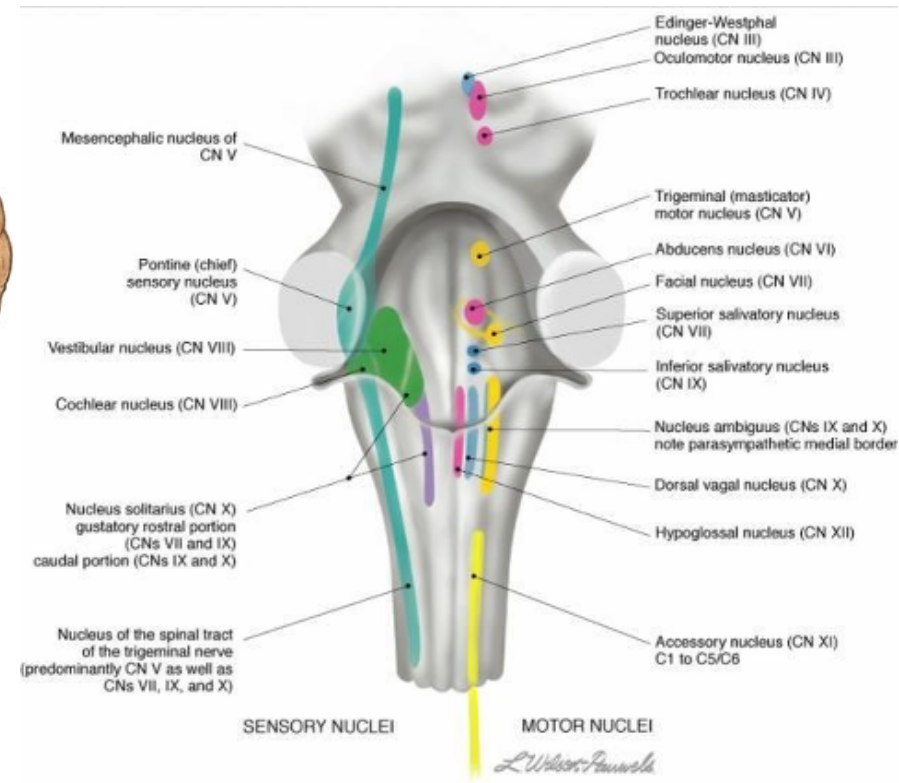
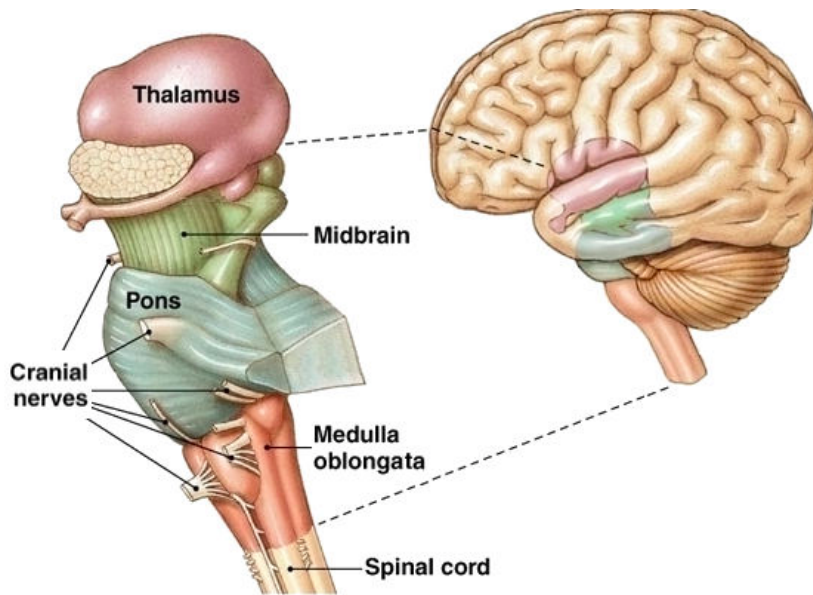


# BRAINSTEM - SITE OF SENSORY PROCESSING

The brainstem is a site of integration for all of the cranial nerves (except CN 1)

Many are connected embryologically and anatomically, so often have an influence on each other

“neurons that wire together, fire together”





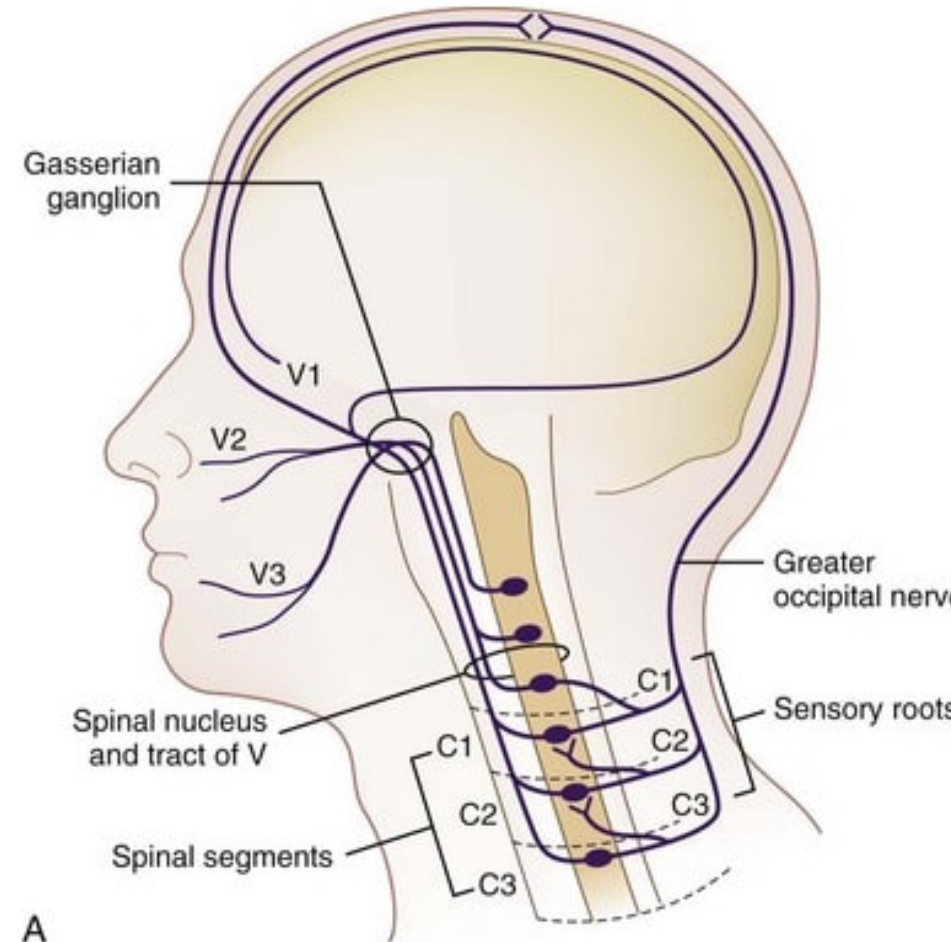
## CONVERGING SENSORY INPUTS

Physiological convergence of

- ▶ trigeminal sensory inputs
- ▶ upper neck (C1-3)

As well as connect with the vestibular nuclei and other brainstem centres (pain modulation, autonomic, auditory, balance, posture and visual processing) (*not shown in diagram*)

**“neurons that wire together, fire together”**





## HOW DO I KNOW IF I HAVE TMD?

### Self- assessment - do you have?

- discomfort or pain in the jaw, especially when eating
- an aching pain in front of your ear, which may spread to your face
- 'locking' of the jaw, making it difficult to open or close your mouth
- a clicking or grating noise when you open your mouth or chew
- an uncomfortable or uneven bite
- headache (especially in the temples, under the eyes and at the sides of the lower jaw)
- earache
- neck or shoulder pain

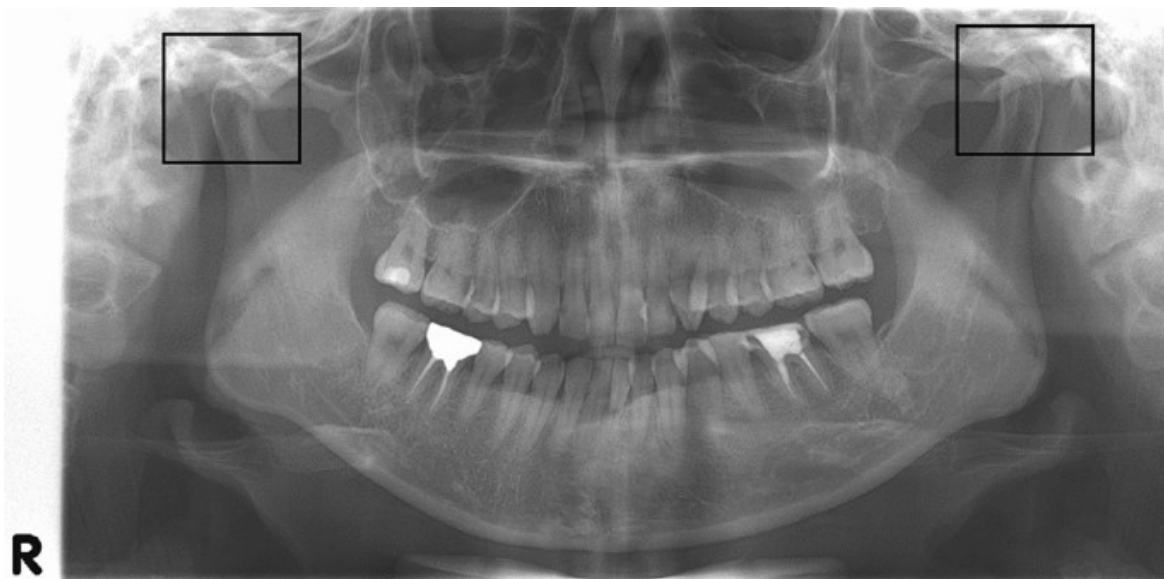




## HOW DO I KNOW IF I HAVE TMD?

### Dental or Orthodontist assessment

- check for signs of inflammation or irritation
- listen for clicking or grinding
- check your range of motion
- XRays (OPG)
- rule out dental or gum disease

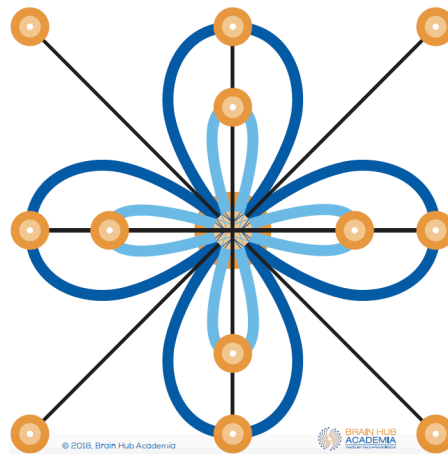




## HOW DO I KNOW IF I HAVE TMD?

### Functional Assessment

- ▶ balance testing
- ▶ posture assessment
- ▶ trigeminal sensitivity
- ▶ pain threshold
- ▶ light/noise sensitivity
- ▶ Neck X-rays
- ▶ Neck control







## TREATMENT OPTION - PHARMACEUTICAL

- ▶ anti-inflammatories
- ▶ anti-depressants
- ▶ opioids and other pain relievers
- ▶ anti-anxiety
- ▶ muscle relaxants





## TREATMENT OPTION - DENTAL

- ▶ splints for malocclusion
- ▶ splints for bruxism (night grinding)
- ▶ bite guards
- ▶ orthodontics and braces





## TREATMENT OPTION - FUNCTIONAL

- ▶ Trigeminal nerve stimulation





## TREATMENT OPTION - FUNCTIONAL

- ▶ low level laser therapy







## TREATMENT OPTION - FUNCTIONAL

- ▶ neuromuscular therapy (TENS)





# TREATMENT OPTION - FUNCTIONAL

- ▶ vestibular neuro-rehabilitation





## TREATMENT OPTION - FUNCTIONAL

- ▶ vagal nerve stimulation







## TREATMENT OPTION - FUNCTIONAL

- ▶ neck therapy (spinal and muscle therapy)



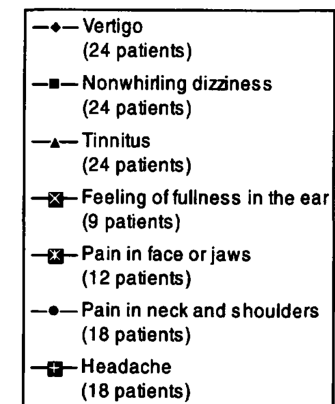
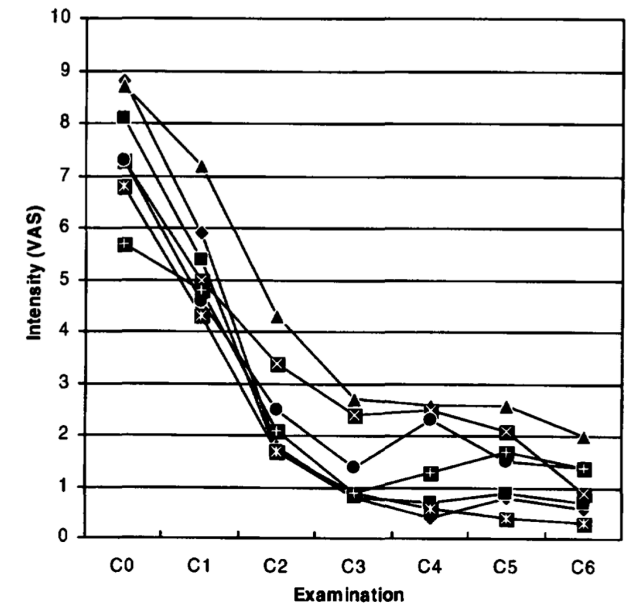




## Symptom Relief After Treatment of Temporomandibular and Cervical Spine Disorders in Patients with Meniere's Disease: A Three-Year Follow-up

Assar Bjerne, L.D.S.; Göran Agerberg, L.D.S., Odont.Dr., Ph.D.

**ABSTRACT:** This study describes the coordinated treatment of temporomandibular disorders (TMD) and cervical spine disorders in patients diagnosed with Meniere's disease. The aim was to follow up treatment outcomes for three years with regular follow-up examinations every six months. Of the 31 patients with Meniere's disease who participated in a controlled comparative study on the signs and symptoms of TMD, 24 participated in a subsequent controlled comparative study on the signs and symptoms of cervical spine disorders (CSD). These 24 Meniere's disease patients (ten males and 14 females) agreed to participate in this longitudinal study. At each follow-up, their symptoms were evaluated using self-administered questionnaires and visual analog scales (VAS). The results of the coordinated treatment showed simultaneous decreases in the intensities of vertigo, nonwhirling dizziness, tinnitus, feeling of fullness in the ear, pain in the face and jaws, pain in the neck and shoulders, and headache that were both longitudinal and highly significant. Significant longitudinal reductions in the frequencies of vertigo, nonwhirling dizziness, and headache were also reported by the patients as well as a complete disappearance of pain located in the vertex area. A significant relief of TMD symptoms and a decrease in nervousness was also achieved. **The results showed that a coordinated treatment of TMD and CSD in patients with Meniere's disease is an effective therapy for symptoms of this disease. The results also suggested that Meniere's disease has a clear association with TMD and CSD and that these three ailments appeared to be caused by the same stress, nervousness, and muscular tension.**



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## TREATMENT OPTION - FUNCTIONAL

- ▶ tDCS for tinnitus





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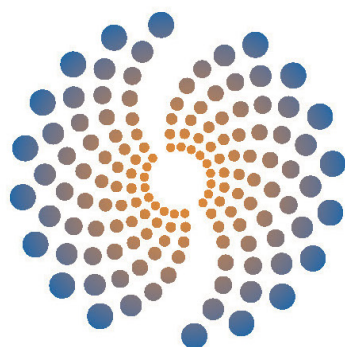
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