

# ESTABLISH HEALTHY TMJ PRIOR TO ORAL APPLIANCE THERAPY FOR SLEEP APNEA

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The American Academy of Sleep Medicine discussed the importance of dentists who fabricate oral appliances must be knowledgeable in the treatment of temporomandibular dysfunction in the “Practice Parameters for the Treatment of Snoring and Obstructive Sleep Apnea” with oral appliances, an update for 2005. “Oral appliances should be fitted by qualified dental personnel who are trained and experienced in the overall care of oral health, the tempormandibular joint, dental occlusion and associated oral structures.”<sup>1</sup>

For many years, medical and dental clinicians have been debating the causes and treatment for TM (temporomandibular) dysfunction. Dr. Hans Selye, MD, of the International Institute of Stress, University of Montreal, Canada, wrote numerous articles and textbooks starting in 1936 about the negative effects of stress on patients’ health. This had a profound effect on the medical profession’s view of this disorder and many patients have told me that their family doctors told them their headaches and other symptoms were mainly psychological in origin. One of the other reasons attributing to that conclusion is the fact that many of these chronic pain patients suffer from depression. The medical profession responds with prescribing anti depressants, pain medication, muscle relaxants and anti-inflammatory drugs for their patients. While it is beneficial to treat the symptoms it would also be helpful to try and find the cause of the problem and treat it accordingly.

The dental profession holds the key and indeed the responsibility of treating these patients. The medical profession is knowledgeable in treating all other joints in the body. It is the responsibility of the dental profession to treat the temporomandibular joint (jaw joint or TMJ).

Temporomandibular Dysfunction is extremely prevalent as the American Dental Association stated that approximately 34% of the adult population has at least one sign or symptom of TMD. The main problem is that this important disorder is not part of the curriculum in most medical and dental schools worldwide. TMD has also been called the “great imposter” since so many of the signs and symptoms can mimic other disorders. These include headaches, neck pain or stiffness, earaches, congestion or ringing in the ears (tinnitus), clicking, popping or grating noises in the jaw joints when opening and closing the mouth, tired jaws or pain when chewing, limited mouth opening or jaw locking, dizziness and fainting, difficulty in swallowing, pain behind the eyes, numbness in the hands, shoulder and back pain. If dentists and medical doctors are not trained to recognize these patients and refer them to someone competent to treat them then they will suffer endlessly.

## **Diagnosis of TM Dysfunction**

### **1. TMJ Health Questionnaire**

Prior to any dental procedure including oral appliance therapy for snoring and sleep apnea, every patient should be given a TMJ Health Questionnaire. Patients will be asked numerous questions to see if they have any of the painful symptoms as outlined above. If the patient has numerous symptoms then there is an increasing chance that they may have TM Dysfunction. A copy of the TMJ Health Questionnaire can be found at the end of this article.

### **2. Range of Motion**

If there are no structural problems within the TM (jaw joint) the patient should have normal range of motion (similar to other joints in the body).

The first consideration is that the patient should be able to open approximately 50 mm (they should be able to fit 3 fingers in between their upper and lower front teeth when they open wide).

A normal movement laterally (right and left) is 10-12 mm. If the patient cannot move laterally as described this could indicate problems within the TM joint.

A normal protrusive movement is 8-10 mm. This is a particularly important movement if you are fabricating an oral appliance to prevent sleep apnea. The research clearly demonstrates that for oral appliances to be effective the patient must be able to move the lower jaw forward. If the patient can only move the lower jaw forward 2 mm then the oral appliance may not be effective.

Clinicians should ask the patient to open very slowly and evaluate the direction the mandible moves on opening. A normal movement is to open straight. If the mandible deviates or deflects to one side then this usually indicates an internal derangement (problem within the TMJ).

### **3. Intra Capsular**

Intra capsular problems are problems within the TMJ. The clinical signs are clicking and popping noises within the TM joint when the patient opens and closes. A normal TM joint is noiseless and painless.

### **4. Extra Capsular**

Extra capsular problems are basically muscle related problems outside the temporomandibular joint, the muscles of mastication are extremely sore especially in the morning when the patient clenches or bruxes at night.

### **5. Muscle Palpations**

It is important for clinicians to palpate the muscles of the head and neck to determine if the muscles are sore due to excessive muscle contractions. Sore muscles indicate a TMJ problem. When the lower jaw (mandible) is not in the correct position to the upper jaw (maxilla) either antero-posteriorly, transversely or vertically, then the muscles of the head and neck often become sore upon palpation.

If the patient wakes up with headaches this is often indicative of the fact that they have been clenching or bruxing (grinding their teeth) all night.

## **Treatment of TM Dysfunction**

### **1. Internal Derangement of TMJ (Intra-Capsular)**

This consists of problems within the temporomandibular joints. The clinical signs would be evidence of clicking or popping noises when the patient opens and closes. The cause is an anteriorly displaced disc. When the patient opens the condyle moves forward on to the anteriorly displaced disc causing the clicking noise. The cause of the problem is that the lower jaw is located too far back when the patient bites on their back teeth. The solution would be to use a lower repositioning indexed splint to be worn during the daytime to move the lower jaw forward. When the click is eliminated when the patient opens and closes in the new forward position this eliminates over 94% of the TMJ symptoms.<sup>2</sup>



**LOWER REPOSITIONING SPLINT DAYTIME**

Patients with internal derangements (clicking jaw) wearing oral appliances for snoring and sleep apnea often wake up with posterior open bites in the morning. Patients must always be advised that this is a possible side effect of wearing oral appliances that move the lower jaw forward in order to open the airway. In most cases, patients bite will return to normal after approximately 30 minutes. However, in severe cases the patient will be left with an open bite between the posterior teeth. Most patients will accept a bad bite in return for wearing the oral appliance which successfully treated their snoring and sleep apnea. One possible solution would be for the patient to wear an anterior repositioning splint during the daytime to allow them to chew properly and an oral appliance at night to prevent the snoring and sleep apnea. Although this posterior open bite is rare, patients must be advised as to the possibility especially if they have an internal derangement (clicking jaw) prior to oral appliance therapy.

## Summary of TMJ Treatment

### Classifications of Internal Derangements

<b>Stage 1</b>	Jaw clicking, no pain <i>No treatment</i>
<b>Stage 2</b>	Jaw clicking, intermittent locking, pain <i>Daytime lower repositioning splint</i> <i>Nighttime upper anterior deprogrammer</i>
<b>Stage 3</b>	Chronic Closed Lock, pain <i>Distraction appliance or surgery</i> <i>Refer to TMJ specialists</i>
<b>Stage 4</b>	Early degenerative osteoarthritis, pain <i>Same treatment as Stage 2</i>
<b>Stage 5</b>	Advanced degenerative osteoarthritis <i>Crepitus, pain</i> <i>Refer to TMJ specialist</i>

### 2. External Derangement (Extra-Capsular)

Extra-capsular problems can be caused by occlusal interferences or parafunctional habits such as clenching or bruxing. The solution would be to wear an upper appliance at night called an anterior deprogrammer to help eliminate the parafunctional habits. The anterior deprogrammer has an anterior bite plate contacting only with the lower central and lateral incisors. This prevents the posterior teeth from occluding. When the posterior teeth are unable to contact, the temporalis and masseter muscles are unable to contract excessively and this helps prevent the clenching and grinding at night as well as the headaches upon awakening.



**UPPER ANTERIOR DEPROGRAMMER**

### 3. **Upper Flat Plane Splints (Mouthguards)**

The most popular splint used worldwide to prevent TM Dysfunction is the upper nightguard.<sup>3</sup> This is a flat plane splint that allows contact with the lower posterior teeth.



#### a) **External Derangement (Extra Capsular)**

Research has shown that the upper nightguard not only does not prevent bruxism (teeth grinding) but rather makes it worse.<sup>4</sup> To eliminate bruxism you must prevent the posterior teeth from contacting during swallowing.

#### b) **Internal Derangement (clicking jaw)**

When a patient wears a flat plane upper nightguard their lower jaw goes posteriorly. Patients with clicking jaws already have their jaws posteriorly displaced with the disc anteriorly displaced. Therefore, flat plane nightguards do not solve the problem. What is even worse, patients in Stage 2 Internal Derangement (clicking jaw) can often end up with Stage 3 Internal Derangement (lock jaw).

#### c) **Aggravation of Respiratory Disturbances by the use of flat plane occlusal splints (nightguards) in apneic patients.**

The problem is that the upper flat nightguard causes the lower jaw to go back and the tongue to go back which blocks the airway at night.

The result is an article written in the International Journal of Prosthodontics, 2004, 17:447-453, Yves Gagnon, Pierre Mayer, Gilles Lavigne.

Snoring was increased 40% using this upper nightguard and AHI was increased more than 50% in 5 out of 10 patients.<sup>5</sup> Clearly it is not advisable to use upper flat plane maxillary splints in patients who snore or have sleep apnea.

Sadly this flat plane upper occlusal splint is the most popular one that is taught in dental schools around the world.



**UPPER NIGHTGUARD  
LOWER JAW GOES BACK**

### **Conclusion**

If 34% of the population has TM dysfunction and the medical and dental schools are basically not teaching their graduates to either diagnose or treat TMD this is indeed a major problem for the public. Dentists need to stop fabricating upper nightguards (flat plane occlusal splints) for patients whose jaws click on opening, who brux at night or who snore or have sleep apnea. The American Academy of Sleep Medicine has recommended that dentists who fabricate oral appliances become familiar with the temporomandibular joint. It is time for the dental profession and particularly the dentists fabricating oral appliances to become more knowledgeable in the diagnosis and treatment of patients with TM dysfunction to help improve the health of our patients.

## **REFERENCES**

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