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**To Evaluate the Effectiveness of Occlusal Splints in TMJ Disorders Using
Joint Vibration Analysis**

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INTRODUCTION

The most common reasons for visits to the dental office are dental caries, periodontal problems or the loss of teeth. Most patients do not report dysfunctions of the masticatory system (temporomandibular joints and masticatory muscles). Small abnormalities in the function of the masticatory system initiate morphological and/or functional adaptations, so patients are able to function without pain.


Temporomandibular disorder is a cluster of coexisting conditions and clinical problems, where the occurrence of muscle-related TMD's is more than intracapsular joint-related TMD's. Due to diverse clinical presentations, corresponding different modifications were done in original Research and Diagnostic Criteria for Temporomandibular Disorders (RDC-TMD criteria) and multiple treatment options are being devised. Apart from thorough history, clinical examination and instrumental and diagnostic casts analysis, the advanced electronic recording techniques such as electromyography, electro-vibratography (EVG), electrosonography, thermography, and electrokinetic and axiographic measuring were documented since the 1980s for better diagnosis and more efficient treatment of disc displacement with reduction (DDR). The use of modern instrumentation and methods in the examination of patients allows for an easy, fast and non-invasive detection of small abnormalities in the motor function of the masticatory system, enabling early preventive and therapeutic measures, which are of great importance in efficient medical treatment. The most accurate and complete diagnosis possible can only help the clinician to develop an effective treatment plan.

Vibration analysis of the TMJ could be clinically useful as a screening examination for TMD patients. JVA (Joint Vibration Analysis) can not only detect an internal derangement, but it is a dynamic test, it can also evaluate how well adapted it is. This allows the clinician to recognize a well adapted internal derangement that does not require treatment (avoiding unnecessary treatment). Joint vibration analysis is based on principles of motion and friction by surfaces, which can be captured by accelerometers. Human joints in

proper biomechanical relationship, in theory, should produce little friction and little vibration surface changes within the joint. It has been postulated that different disorders can produce different vibration patterns or signatures in joint including the TMJ's. Vibration analysis of the TMJ is thus a quantitative process that measures the absolute intensity and frequency distribution of vibratory waves emanating from the joint during jaw motion. Analysis (JVA) could have the potential to provide data that could be used to assess the phenomenon and to indicate the status of the joint.

Occlusal splint therapy has been used routinely for diagnosis and treatment of various masticatory system disorders. Treatment with these appliances is non-invasive, reversible and provides proper treatment. Literature provides an understanding of treatment protocol for the use of splints for temporomandibular disorders. The selection of particular splint design appropriate for patients disorder will be facilitated by a better understanding of its physiologic and therapeutic effects. Hasegawa suggested that splint therapy can reduce pain in the temporomandibular joint caused by excessive occlusal pressure. In this manner, splint restores blood circulation to the TMJ by maintaining a wide gap between the mandibular condyle and the mandibular fossa. While majority of patients experience symptomatic relief in response to a splint, approximately 30% of patients do not experience any improvement in temporomandibular arthrosis.

The goal of an occlusal appliance is to provide orthopedic stability to the TMJ that alter the patient's occlusion temporarily and may be used to decrease parafunctional activity. While treating TMD's, challenge for clinician is to choose the correct type of splint although some studies suggested that success of splint therapy has less to do with the splint make or type and more to do with the primary disjunction of ingrained neuromuscular reflexes due to partial nonengagement of maxillary and mandibular teeth. The conventional routinely followed design, i.e. anterior repositioning appliance requires regular and repeated evaluation with risk of posterior open bite in the long run.

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