

Neuromuscular Dentistry: Use and Abuse

Fabio Savastano*

International College of Neuromuscular Orthodontics and Gnathology, Italy

***Corresponding Author:** Fabio Savastano, International College of Neuromuscular Orthodontics and Gnathology, Italy.

Received: February 20, 2019; **Published:** March 27, 2019

In the 1970s Dr. Bernard Jankelson described a new diagnostic modality that he would later define as Neuromuscular Dentistry. This methodology involved the use of bioelectrical instrumentation in the diagnosis and treatment of occlusal disorders. He can be considered a pioneer in the field of dentistry: just try to imagine what technology was like in the 1970s to put this into perspective. His studies had started well before then, in the early 1950s, examining why failure was so often seen in complex prosthetic cases using the classic procedures of his time. Dr. Jankelson's studies continued at the University of Washington and produced several publications that would later be considered the basis of Neuromuscular Dentistry (NMD) [1-6]. The Myomonitor, an ultra-low TENS (Transcutaneous Electrical Nerve Stimulator) device to stimulate and relax the muscles of head and neck, was introduced to the public in 1966 and sold by the newly founded Myotronics Research Inc [7]. Mandibular Tracking was developed during the following years, and in 1978, in collaboration with Dr. Fray Adib, the K5AR model was presented to doctors worldwide. I still own a K5AR, and I take a look at it every once in a while, to remind myself of how much effort it must have taken to develop it and how much effort it must have taken for me to learn how to use it. Surface electromyography was added in 1981 and in 1983 you could record mandibular movements with simultaneous EMG recordings. There were no laptop computers that you could hook-up, so to record data, the EMG was thermally printed and K5AR scans (oscilloscope style) were frozen so you could take a photo with your Polaroid.

I have been using this diagnostic technique for 30 years. I have seen years of progress in technology and how it has affected my practice. A complete neuromuscular evaluation is now a very simple task in comparison with 30 years ago, and any dentist can easily learn how to use the system after a short course. You may need to revise some anatomy and physiology, but the effort is well rewarded. In this span of time, I have seen several critiques of this approach by well-known dentists around the world. I do not want to discuss this criticism in this brief editorial, but rather underline how the disapproval of NMD seems to have lost steam in the last ten years or so. I have some proof that the general dental community is slowly steering towards understanding that a purely mechanistic approach to dental occlusion and TMJ function is a big failure in the dental community. Of course, there are still some institutions that prefer to keep their eyes closed, but it's a matter of time and their main focus will be on their pensions. Just use your browser to look-up "neuromuscular dental" or "neuromuscular orthodontics" and you will see that NMD is a reality. This change in direction is probably due to the recognition of the role of muscles and the development of the face in the determination of occlusal relationships. This more functional approach is underlined through the diagnostic factors related to healthy breathing and head posture that many dentists are now aware of. There is also a growing awareness among dentists that their mis-treatment can cause TMJ disorders, despite tens of publications that state the opposite. There is some speculation that epigenetic factors have a major role in the development of occlusion. This would be a sort of revenge of the "Functionalists" over an exhausted skeptic dental community. The importance of muscles for a stable, functional occlusion is easily seen in swallowing disorders.

The most important issue relating to NMD is that the main goal of this technique lies in the determination of the physiological rest position of the mandible. This simply means that the diagnostic protocol is separated into two phases during patient study: habitual and after mandibular distraction. Habitual refers to the evaluation of mandibular movements, muscle activity (during rest/clench) and determination of habitual rest position (HP) of the mandible. Mandibular distraction is obtained by reducing/interrupting all possible afferent inputs from the periodontal ligaments to the Central Nervous System (CNS) during tooth contact. This is a procedure that requires placing wax or other inter-occlusal material to avoid tooth contact during TENS pulsing. After 45 minutes of pulsing, and after checking via EMG

that the muscles are relaxed, the new rest position of the mandible is recorded. This is called the Physiologic Rest Position (PRP). It is the difference between these two rest positions that matters to the neuromuscular dentist: from the PRP (as seen on the mandibular kinesiograph) TENS spikes are presented as movements to closure of the mandible along a new occlusal trajectory unlinked to the present occlusion. This “muscular pathway” is given by the peripheral stimulation of the TENS on nerves V and VII. The habitual rest position reflects an accommodation of mandibular position with respect to occlusion and is determined by the CNS to create a starting point towards centric occlusion with the lowest energy demand [8]. This accommodative response assures avoidance of premature nociceptive tooth contacts. We all have a certain level of accommodation, and we are all maloccluded to some degree.

Unfortunately, the abuse of the terminology “neuromuscular dentistry” is common, as is the case for any technique that is growing in popularity. You are not performing a neuromuscular diagnosis if you do not place occlusal wax or other inter-occlusal material during TENS pulsing. Simply put, you would not be using the equipment for its primary purpose. The same can be said for some doctors that use equipment that cannot record Sagittal/Frontal scans, as indicated by Dr. Jankelson. The growing popularity of mandibular tracking has prompted several companies to try to replicate the original mandibular kinesiograph at cheap prices with cheap results. What about surface electromyography? Without any standard and proven methodology, several EMGs are on the market with silly software that drives you crazy. On the other hand, I continue to hear lecturers state that their ‘therapeutic mandibular position’ (obtained using very questionable methodologies at the time) and my centric (Myocentric) obtained using the neuromuscular procedure, are equivalent. Sorry to delude you buddy, but they are not. Now, with increasing frequency, I hear of a “muscular position of bite recording”: come on, give me a break!

Let me conclude that I now think that there are two new abuser categories in NMD: those that do not want to admit that NMD has always been more interesting and more useful for problem-solving than any other diagnostic methodology and do their best to respect muscle function without the use of bioelectrical instrumentation, and those that have the bioelectrical instrumentation but do not respect the fundamentals of NMD. There are no short-cuts pals!

Bibliography

1. Jankelson B. “Physiology of human dental occlusion”. *Journal of the American Dental Association* 50.6 (1955): 664-680.
2. Jankelson B. “Neuromuscular aspects of occlusion. Effects of occlusal position on the physiology and dysfunction of the mandibular musculature”. *Dental Clinics of North America* 23.2 (1979): 157-168.
3. Jankelson B. “[Occlusion--new concepts]”. *L'Information Dentaire* 47.45 (1965): 4205-4207.
4. Jankelson B. “Electronic control of muscle contraction--a new clinical era in occlusion and prosthodontics”. *Scientific and Educational Bulletin* 2.1 (1969): 29-31.
5. Jankelson B. “Functional positions of occlusion”. *Journal of Prosthetic Dentistry* 30 (1973): 559-560.
6. Jankelson B., et al. “The physiology of the stomatognathic system”. *Journal of the American Dental Association* 46.4 (1952): 375-386.
7. Jankelson B and CW Swain. “Physiological aspects of masticatory muscle stimulation: the myomonitor”. *Quintessence International, Dental Digest* 3.12 (1972): 57-62.
8. Savastano F. “Applying neuromuscular techniques in the orthodontic setting”. *South European Journal of Orthodontics and Dentofacial Research* 4.2 (2017): 31-42.

Volume 18 Issue 4 April 2019

© All rights reserved by Fabio Savastano.