

ORTHODONTICS

CONVENTIONAL VERSUS NEUROMUSCULAR

Dr's David Buck and Tim Gross, co-directors of LVI's new Physiologic Orthodontics program, were asked, *"What is the difference between conventional orthodontics and physiologic orthodontics?"* Here are their answers:

David Buck, DDS

Conventional orthodontic diagnosis depends on a static lateral cephalometric image that relates the jaws to the cranial base, and assessment of the dentition. What is not considered is the position of the cranium in relation to the rest of the body. We fully acknowledge that the posture of the mandible is affected by head position, notably forward head posture. Additionally, the maxilla may not be in harmony with the orthogonal posture of the cranium at time of diagnosis. Further, the status of the masticatory muscles is not considered in conventional orthodontic diagnosis, along with CBCT TM joint imaging of (adult) patients at presentation. Conventional orthodontics and the dental profession at large still minimally consider the functioning capacity of the airway. If we can accept that our modern diet and ubiquitous nature of allergies has caused craniofacial deficiencies in a high percentage of the population, then accordingly there is a high prevalence of malocclusions which are necessarily accompanied by airway problems, and sleep disordered breathing. Neuromuscular orthodontic diagnosis therefore includes an airway assessment.

Thus in the vast majority of patients who start orthodontic treatments, the posture; TM joints; muscles of the head and neck; and sleep breathing problems may very well all be pathologic when treatment begins. Since the occlusion is being developed with the aforementioned factors in play, there is little chance that the orthodontic patient will have a physiologic condition of muscles, joints, posture, and airway at completion of care. Conventional orthodontics focuses on the interdigitation of teeth following Angle's classification scheme as the dominant influence on treatment decisions, with a much reduced emphasis on facial and soft tissue assessments and skeletal measurements. Neuromuscular orthodontic treatment starts with reversible corrective orthotic therapy to stabilize all factors which would contribute to a non-physiologic outcome. Once the system unwinds and is stable, active tooth movements can begin knowing the proposed final outcome before irreversible treatment commences.

It is been my clinical experience that the protocol of conventional orthodontics with simultaneous activation of all the teeth in a non-physiologic muscular environment greatly increases the risk of unwanted intrusive movements that lead to compressed TM joints, posterior hypo-occlusion, and an overall increased pathologic state of the Neuromuscular system. It is deceptive when examining these patients as the posterior teeth look to have normal clinical crown length, and the anterior coupling, and Shimbashi can appear normal. Intrusion just like extrusion moves the entire gingival/alveolar apparatus with the tooth maintaining existing clinical crown length. When the scope of examination is expanded to look at Neuromuscular aspects, the pathology becomes much clearer. In many cases although the dental vertical looks adequate, the skeletal vertical is definitely not. The cephalometric analysis used for Neuromuscular orthodontic diagnosis has a unique feature in providing a reference for the range of skeletal vertical normality for an individual patient and can serve as an invaluable guide to treatment decisions.

We as Neuromuscular clinicians providing orthodontic treatments acknowledge that the major reasons for orthodontic case failure are lack of vertical development, and lack of adequate arch development. These are 2 of several critical keys to success in Neuromuscular orthodontic treatments. It has been my clinical experience treating advanced TMD adult patients for 14 years with Neuromuscular protocols, that a common thread amongst these patients is that a majority have had orthodontic treatments already. I am of the distinct opinion that the nature of conventional orthodontic protocols is a significant culprit in creating a TMD pain patient in time as the adaptive capacity of these patients is overwhelmed with chronic pathology in the multiple areas as mentioned above. I am further of the distinct opinion that chief among the reasons for this are unwanted, and undetected intrusive orthodontic movements leading to among other things compressed and pathologic TM joints.

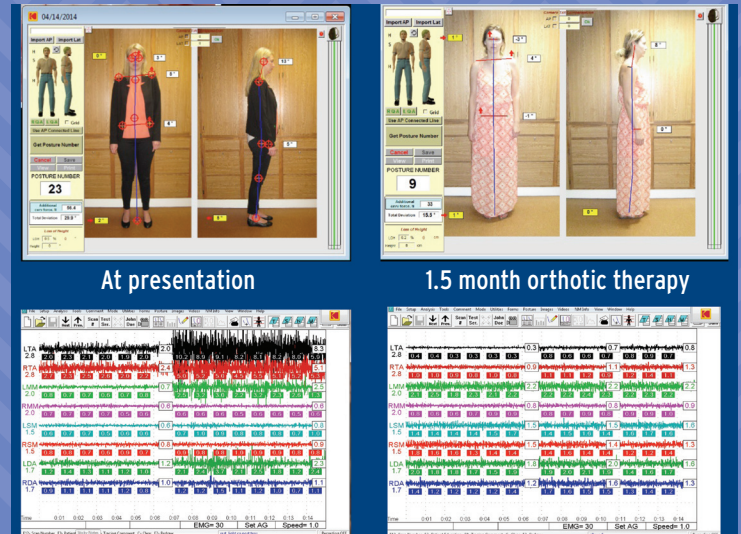
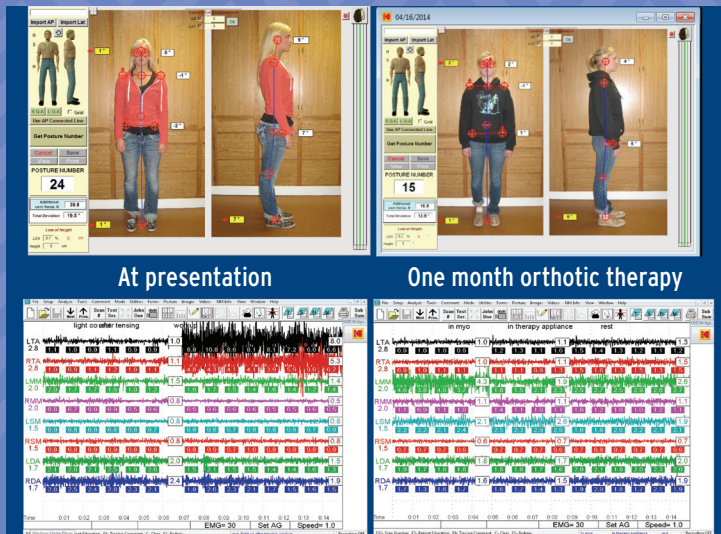
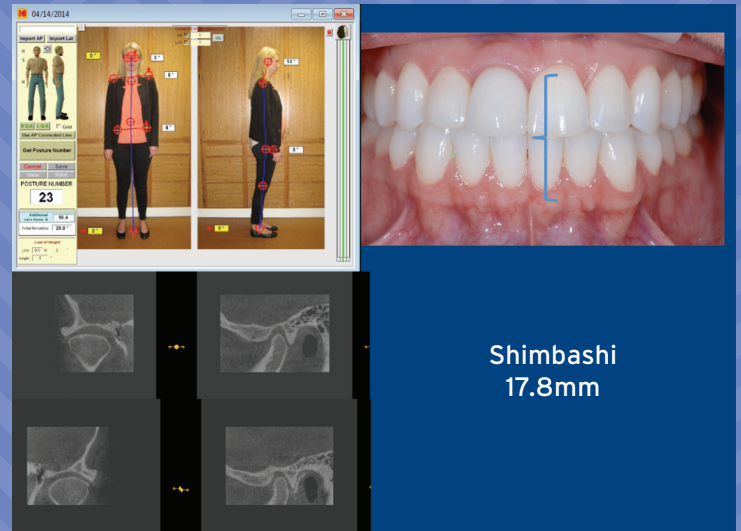
Let's look at how conventional orthodontic treatments done without a Neuromuscular approach create compromised outcomes.

First case:

- Female early 20's
- Orthodontically treated twice
- Disabling migraines with multiple hospitalizations in acute, intractable pain. Migraine medications do not work.
- Patient has headaches 3-4 times per week with severe migraines almost weekly
- No other systemic, lifestyle contributory risk factors now in phase one orthotic therapy for 2.5 months
- No migraines for 6 weeks, minor very mild headaches only once per week
- No hospitalizations for pain management
- Will be treated orthodontically for third time

Second case:

- Female late 30's
- Orthodontically treated twice for esthetic concerns
- Chronic neck pain
- Chronic joint pain, radiating facially
- Chronic joint noises and pain on eating
- Low grade headaches
- Meds Cymbalta for depression/anxiety



I offer two examples of patients seeking help for significant pain and headaches. Both have had multiple rounds of conventional orthodontics, and are now in disabling pain which affects all areas of life. Note the corrupt posture at presentation, the higher the number on Posture Pro the more damaged the postural presentation, and note the unstable and hypertonic muscles in MIP. The TM joints on both patients are highly compressed, distalized, and painful yet the appearance of the occlusion looks “normal” as viewed in the intraoral views. This demonstrates the “intrusive” problem inherent in conventional orthodontics. Notice how both the muscles and posture are correcting while these patients are in orthotic therapy. They both are also reporting significant reduction of pain complaints. This sets the stage for corrective orthodontics when the system becomes stable and pain-free.

Tim Gross, DMD:

Physiologic Orthodontics: So much more than straight teeth.

- Teeth will intercusate maximally.
- Mandibular posture will compensate for maximal intercusation.
- Compensatory mandibular posture leads to muscle strain.
- Masticatory muscle strain leads to craniocervical postural change.
- Postural stability and occlusal stability are codependent.

The science and mechanics of moving teeth is abundantly researched and published.

There are new technologies emerging to enhance tooth movement efficiency. But now emphasis on the physiology of the entire person must be integrated into the diagnosis, treatment plan and application.

The typical patient comes to the office and says, "I wanted straight teeth. I don't like the way my teeth look. Can you fix my smile?"

General dentists and orthodontists oblige with clear aligners or brackets and wires and make the teeth quite pleasing in appearance. With skill, the anterior teeth can be moved to follow the lipline, teeth are straight, midlines are aligned and contacts are tight. Voila! Another successful orthodontic result, or is it? Orthodontic tooth movement has evolved beyond making teeth straight for the sole purpose of cosmetics.

For physiologic orthodontics, it is all about the bite. In other words, it is about correcting malocclusions. But before proceeding, the definition of malocclusion must be clarified. It is interesting that a web search for the definition of malocclusion came up with eight incorrect definitions before the ninth one correctly defined it. According to About.com, "Malocclusion is a discrepancy in the way the upper jaw and lower jaw meet, or more simply, how they bite together." Well put, About.com. Well put. Correctly, there is no mention of teeth. The misunderstanding by most people, general

dentists as well as dental specialists included, is that the bite is the way in which the teeth come together, when it is actually the way that the upper and lower jaws meet. The reality is this: there are people with terribly misaligned teeth that have a good bite and people with perfectly straight teeth that have a bad bite. So if not the teeth, then what determines the bite? The answer is simple: everything. Posture, airway, habits, development, genetics, trauma, nutrition, teeth alignment and tooth loss are all possible determinants of the bite. To correct the bite is to correct whatever caused the malocclusion.

Physiologic orthodontics corrects the occlusion, i.e. the relationship of the upper and lower jaws, before even a single orthodontic bracket is ever bonded to a tooth. Airway patency is first addressed. An anatomical functional orthotic is bonded to the teeth to correct vertical, anterior-posterior, lateral, yaw, pitch and roll discrepancies of the bite. Temporomandibular joint decompression is objectively confirmed radiographically. Postural issues are corrected. The optimal physiologic relationship of the mandible to maxilla is refined with coronoplasty of the orthosis. Then, after occlusal stabilization is complete with comfortable teeth, muscles, joints, tendons and ligaments of the oral and craniocervical complex, orthodontic tooth movement is initiated. Orthodontic treatment begins only after physiologic stability is achieved. In summary, first the final position of the occlusion is determined, and then the teeth are moved to that position.

Physiologic based functional orthodontics has trumped conventional cosmetic based orthodontics. Architect Louis Sullivan said, "Form follows function." That axiom can be applied to orthodontics by stating, "Cosmetics follow physiologic function." Moreover, the application of physiologic orthodontic principles will yield a cosmetic result that is comfortable and maintains long term stability. Primum non nocere (First, do no harm.)

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