I want to thank the editor of the AJO-DO for inviting me to respond to the essay by Professor Rudy Slavicek. Unlike him, I won’t be starting at the time period of 5 to 6 million years ago. Instead, I want to focus on the current situation in the orthodontic field in regard to disorders of the masticatory complex and adjacent structures; these usually are collectively described as temporomandibular disorders (TMD). However, I noticed that Professor Slavicek used this term only twice in his essay.

My main concern for many years has been the role that orthodontists think they should play in dealing with various types of TMD. As Okeson1 pointed out, “It is difficult to imagine a specialty that routinely and significantly changes a patient’s occlusal condition would not have a powerful effect on the masticatory structures [eg, the temporomandibular joints (TMJs)] and their functions.” This obviously correct observation has, in my opinion, been used to justify both appropriate and inappropriate behaviors by orthodontists as they encounter TMD in their practices. The need for orthodontists to constantly monitor and evaluate the relationships between their occlusion-changing procedures and the well-being of the TMJs cannot be disputed; it is the very essence of their daily work. As I like to tell my orthodontic students, “You are in the occlusion-disrupting business, so you must have reasonable treatment objectives and procedures to move every patient’s dentition to a new set of occlusal and craniomandibular relationships that will be biologically acceptable.”

However, the above truisms do not automatically translate into a conclusion that failure to produce some expert’s version of a good occlusal or craniomandibular outcome is a risk factor for developing TMD. Furthermore, it does not mean that an untreated person with a malocclusion or a nonideal TMJ relationship (whatever that means) is at risk for developing TMD. Finally, it does not mean that patients with active TMD symptoms and craniomandibular or occlusal imperfections will need orthodontic treatment to become healthy.2 If TMD symptoms arise during active orthodontic treatment, it is possible that the mechanical forces and transient occlusal mal-relationships have exceeded that patient’s capacity for adaptation, but it is even more likely that some adolescents and young adults treated by orthodontists will simply develop TMD coincidentally during the 2- to 3-year period of treatment.

Interestingly, I find myself in agreement with many of the points raised by Professor Slavicek, although I disagree with others. In his section on “First period of the mixed dentition,” he correctly stated that eruption of the first molars and exchanging deciduous anterior teeth with the permanent ones will set the table for structural adaptations of the TMJ; as he concludes, “This means that occlusion dictates adaptation.” In a later section on “Functional period of maturation,” he correctly stated that “the position of the mandible is determined 3 dimensionally by the occlusion of the teeth.” However, it is at that point that he and I might differ in our interpretations of those facts. He seems to regard the mandibular position as fragile and intolerant of phenomena such as so-called functional interferences in occlusion (or the disruption produced by orthodontic treatment). I was glad to see that he devoted only 1 sentence to the proposition that “Avoidance patterns [elicited by functional interferences] . . . might be 1 reason for” TMD. This notion goes back over 75 years, and, despite the overwhelming evidence against it, we still hear it repeated constantly in the TMD field.

However, my 45-year background in the TMD field leads me to believe the TMJ is remarkably resilient and capable of putting up with a lot of diverse dental...
The TMJ is remarkably resilient and capable of putting up with a lot of diverse dental concepts and procedures.

concepts and procedures. It is this very resilience that makes it possible for dentists to create regional crowns and bridges as well as full-mouth reconstructions, while orthodontists and orthognathic surgeons produce even more massive occlusal changes either slowly or quickly. Not only are these major interventions, but the concepts for carrying them out can differ quite a lot from 1 dentist to another (not to mention between 1 expert and another). Yet, most patients “adapt” to the various versions of these procedures are carried out; this is a tribute to the body’s ability to regain homeostasis, but some dentists seem to be unable to accept this fundamental biological concept when it comes to the TMJ.

The main points advanced by Professor Slavicek that I disagree with are to be found in his section on bruxing and clenching, which has a subheading, “the role of teeth in stress management.” To his credit, he did not invoke the old concepts of occlusal disharmonies being responsible for causing these parafunctional activities. However, his statements about reducing stress through bruxism or using the masticatory organ as a psychic stress valve are based on outdated ideas about that relationship, as are the rather old literature references that he cites. Therefore, his final sentence in that section (“Grinding and clenching are expressions of psychic stress assimilation and are mainly controlled by the neuromuscular system and occlusion.”) is no longer regarded as a correct theory, although psychologic factors can play a role in awake bruxism. Instead, during the past 20 years, research in this field has been conducted primarily in sleep laboratories, where it has been shown that significant nocturnal orofacial parafunctions (sleep bruxism) are part of a disordered sleep cycle, and they are now labeled as parasomnias. Space does not permit a full discussion of this topic here, but readers will be better served by looking into that literature instead of the articles cited by Professor Slavicek.

In the last section of his essay, Professor Slavicek offers a brief summary of “gnathology,” which oddly is referenced only to the article by Rinchuse and Kandasamy that was quite critical of the myths of orthodontic gnathology. His original response to their article was sent to the AJO-DO, which persuaded our new editor to invite him to participate in this Point/Counterpoint. I had expected Professor Slavicek to mount a more vigorous defense of gnathology as an occlusal discipline that was essential for the practice of orthodontics in this section. Instead, he merely offered a few sentences to define the term and to extol its virtues as a major theory of how the masticatory system works and how it should be treated. Although I am not a fan of gnathology as a superior conceptual framework, I do respect the dedication of dentists who follow the gnathologic discipline when they are performing major restorative dental procedures. There is an old joke that compares a gnathologic dental reconstruction protocol to an airplane flying from Chicago to Detroit via Los Angeles; when you get to your destination, everything is fine—but it was a long trip. However, Rinchuse and Kandasamy objected to the inference that the concepts and procedures of gnathology should be viewed as a superior approach for the practice of orthodontics, where no teeth are being structurally altered. In my opinion, their criticisms regarding this issue are well founded, since no evidence either from inside the specialty or from external occlusion authorities has proved the necessity (or even the utility) of following this type of complex protocol during orthodontic treatment.

Finally, the Conclusions section of Professor Slavicek’s essay consists of a series of short sentences that summarized much of what has gone before. I found myself in agreement with almost every one of those statements, because they correctly describe how the masticatory system is built and how it works. Only the last sentence, which links the mouth with the psyche, is somewhat overstated; surprisingly, there is no mention at all of either orthodontic treatment or TMD in this final section. I hope this means that Professor Slavicek and I are closer to some degree of agreement than we might have initially expected. I salute his lifelong dedication to the study and restorative treatment of the masticatory apparatus.

WHAT SHOULD ORTHODONTISTS KNOW AND DO ABOUT THE TMJ

In this final section of my essay, I want to offer my conclusions regarding how orthodontists should be thinking about the TMJ in the 21st century. Some of these issues are discussed by Stockstill et al; their article, which appears in this issue of the AJO-DO, is based on a survey of American and Canadian orthodontic programs. Those programs were asked about how they teach the topics of occlusion, the normal TMJ, and TMD to their graduate students. The survey results...
suggestions that some programs are doing a good job of covering these subjects in a contemporary scientific framework, while others are still teaching some outdated or incorrect concepts about at least 1 of these topics.

First, it is absolutely essential that orthodontists understand the processes of growth and development of the masticatory system, of which the TMJ is a major component. This is fundamental knowledge in their chosen field. They can argue among themselves and with the basic scientists about what role the TMJ plays in those processes, because not all of these issues have been resolved yet. Second, they should recognize that internal derangements of the TMJ discs in growing patients can cause some mild mandibular asymmetry to occur, and this should be taken into account during their treatment; however, there is no need to treat the discs themselves, because frequently they will adapt to their new positions. Third, orthodontists should study and understand the effects of functional appliances on growing mandibles and avoid their use in mature patients. Finally, they should try to finish treatment with the TMJ in a reasonable and biologically acceptable retroposed position. Unlike the gnathologists, who speak of positions as cause of centric relation in tenths of millimeters, I believe that most condylar positions obtained at the end of good orthodontic treatment ultimately will be OK—as long as you don’t finish in protrusion (old joke line). If your referring dentists demand an unreasonable degree of precision from you in this matter, you have to educate them about the realities of how the TMJ works, and how well it can adapt to a variety of time-tested finishing techniques in your specialty.

Regarding the subject of TMD, it is clear that orthodontists should screen their patients for pretreatment TMD signs and symptoms—but in doing so they need to have a realistic understanding of the difference between TMJ trivia and meaningful symptoms. They should be more careful when dealing with patients who have a significant TMD history, because they might be more vulnerable to recurrences and symptom flare-ups during orthodontic treatment than normal subjects. If TMD symptoms arise for the first time during your orthodontic treatment, you should be prepared to recognize and manage those symptoms while discontinuing active orthodontic therapy. If this keeps happening for certain patients, you might need to adopt a compromise treatment plan or even discontinue altogether. Finally—and this is the most important advice I have: orthodontists need to say NO to their referring dentists and to the TMD patients they send to you for orthodontics as a solution to their TMD problems.

Current practice guidelines in the TMD field emphasize classic history and examination procedures to diagnose TMD in a medical orthopedic framework, and treatments should be selected from the universe of conservative and reversible procedures. Occlusion-changing and jaw-realignment procedures are no longer considered appropriate treatments for most TMD patients, and management success is improved when patients are treated in a biopsychosocial framework. Orthodontists can play an important role in this new treatment paradigm because they have advanced biomedical training and good clinical skills, but we don’t need their mechanical procedures to have good outcomes with our orofacial pain patients. I hope that Professor Slavicek can agree with some of these ideas, and I thank the editor for asking me to write this response essay.

REFERENCES


