Letters to the Editor

To the Editor:

Whatever Happened to Occlusion?

In the days of Glickman[1] and the dissenting research by individuals like Waerhaug[2] and Ramfjord,[3] occlusion was argued and debated everywhere in dental academia. Theories were postulated, discussed, and often refuted, but controversy motivated more thought and discussion. Dental schools competed to be the center of thought on occlusion, and their various researchers and teachers were considered "occlusion gurus" or "authoritarians."[3] There were new studies and hypotheses but much more controversy. Today, there has been a diminution of the topic of occlusion in research, dental curricula, and continuing education.

The American Dental Association (ADA) Survey Center[4,5] compiles clinical science hours of instruction for all American dental schools. Compared to the 1983 through 1984 academic year, the hours devoted to occlusion in the 2003 through 2004 year were 24% less in didactic instruction, 25% less in laboratory instruction, and 29% less in intramural patient care. Also notable was the extreme variance among the 55 schools surveyed in 2003 to 2004. Although the mean total of instruction in occlusion was 55 hours, the minimum was 18 hours and the maximum was 253 hours. This inconsistency suggests that there is minimal agreement or communication between the schools or that there is little oversight or input from the ADA or the American Dental Education Association.

These statistics verify the perception of diminishing importance that dental schools are placing on the teaching of occlusion and the divergence of emphasis on occlusion in the curriculum. It seems that occlusion has fallen into the "black hole" of dental education. Many dental schools allow the teaching of occlusion to float or drift from one department to another. Often, there is no specific course or department on occlusion, but it is alluded to or discussed in all areas of dentistry.[6,7] Controversy exists everywhere in life. In dentistry, we hope that a scientific and intellectual approach will encourage evidence-based research that leads to resolution of these disagreements. However, this is not always possible. Occlusion is a field of dentistry that is rife with controversy and has little evidence-based research to substantiate many of its tenets. Much occlusal therapy is based on hypotheses, experience, anecdotes, conjecture, and even mythology.[8]

The diminution in publications on occlusion (Tables 1 and 2) has followed a similar pattern over the past 30 years. From 1976 through 1985, 7.27% of dental publications discussed "dental occlusion." Although the total number of dental publications increased 24% in the 10-year period from 1996 through 2005, the number of papers on dental occlusion decreased and represented only 5.35% of the total. A question arises as to whether the reduction of the importance of occlusion in education over the past years influenced the research negatively or if controversy over the relevance of the research influenced the curricula.

Evidence-based research is what we all seek, but it is not always attainable. This may be due to the inconsistent definition and diagnosis for trauma from occlusion, conflicting theories and arguments over the "appropriate" terminology, and the inability to establish a laboratory model that replicates all of the factors in occlusal trauma. The American Academy of Periodontology published its last position paper on occlusion in 1996.[7] It identified many of the controversies in occlusion. It was found that the "results are inconclusive on the interactions between occlusion and the progression of attachment loss." The paper included a glossary of terms and defined occlusal traumatism as the "overall process by which a traumatogenic occlusion produces injury in the periodontal attachment apparatus." In 2000, the Academy published its "Parameter on Occlusal Traumatism in Patients with Chronic Periodontitis."[9] This paper reaffirmed the Academy's position but acknowledged that signs and symptoms of temporomandibular dysfunction also may be related to occlusal traumatism.

The textbooks on occlusion vary considerably, with some emphasizing bruxism and others minimizing it. These differences depend on which studies the author accepts and finds to be relevant and those

Table 1.

Percentage of Published Literature Devoted to Research in Dentistry and Occlusion

	All	%
Dentistry 1976-1985	130,849	
Occlusion 1976-1985	9,508	7.27%
Dentistry 1996-2005	161,972	
Occlusion 1996-2005	8,665	5.35%

Table 2.

MEDLINE Search Strategies Used

	Search Strategy Models
Dentistry 1976-1985	(exp Dentistry/or exp Stomatognathic System/or exp Stomatognathic Diseases/) limit 1 to year = "1976-1985"
Occlusion 1976-1985	(exp Dental Occlusion/or exp Malocclusion/or exp Jaw Relation Record/) limit 1 to year = "1976-1985"

which are rejected. Terminology and definitions differ from one text to the other. Although some writers limited trauma from occlusion to attrition and mobility, others included temporo-mandibular dysfuntion (TMD), splaying and shifting of teeth, and abfraction[10] as signs and symptoms of occlusal trauma. A recent "Point/Counterpoint" article in the *Journal of the American Dental Association*[11] pitted periodontists against each other arguing the relationship between occlusal forces and periodontal destruction. Both sides reviewed the past century of research and commentaries and, although they represented dissenting positions, they ultimately agreed that traumatic occlusion, in the presence of periodontitis, can act as a co-destructive force and that prophylactic occlusal adjustment is not indicated or advisable. Studies were cited, and it was acknowledged that occlusal discrepancies are common but do not always create trauma from occlusion.

We should consider redefining and agreeing on terms that have been altered over the years that remain inconsistent in papers and textbooks. First, let us decide whether "occlusal traumatism,"[12] "trauma from occlusion,"[10] or traumatogenic occlusion"[13] should be the preferred term. These terms have been bantered about for over 50 years with one group or textbook insisting on one term and another group insisting on another. What role do occlusal habits or bruxism play in creating trauma from occlusion and in the etiology of TMD? Occlusal habits associated with TMD do not always involve tooth-to-tooth contact but can include nail biting, ice chewing, and mandibular thrusts. Often, patients who are retrognathic develop habits of thrusting their mandible forward to achieve a more esthetic profile. There are patients with neurological disorders[14] who have uncontrollable mandibular thrusts or tics. These habits can persist for long periods of time, leading to temporomandibular dysfunction and pain. When evaluating myofascial pain, attrition, and tooth mobility, perhaps we should consider the concept and term of "trauma from occlusal habits"[15] as a major cause of disease.

Upon request, the Academy of Periodontology was able to find past programs from the Academy's annual meetings. In 1975, there were nine presentations on occlusion. These were talks, continuing education programs, and lunch and learn sessions. The 1980 meeting listed seven such presentations. By 1985, interest in occlusion seemed to be waning. There were no topics on occlusion, but there were four on TMD, and one might assume that occlusion was discussed in some of these. The 2005 meeting had no mention of occlusion or TMD in the entire program. Occlusion, an integral part of dentistry, cannot continue to be minimized. The leading researchers and clinicians in periodontics should be called upon to reverse this trend. A starting point for the Academy would be the formation of a "workshop" that would define the nomenclature, identify the issues, evaluate the studies, and establish a curriculum for occlusion that is understandable, meaningful, and universally accepted. Evidence-based research must be the foundation of these decisions if they are to be accepted by all dentistry. If sufficient studies are lacking, it is incumbent upon the international research and clinical organizations to encourage the proper research that will resolve these controversies.

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