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Editorial

From optional to essential: Why the temporomandibular joint and occlusion deserve a core place in dental education curriculum

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The global dental profession is evolving rapidly, driven by material science, digital technology, artificial intelligence and a profound understanding of the stomatognathic system. As future practitioners, we must champion educational standards that reflect this progress. A persistent and critical failure in the dental curricula is the inadequate, superficial, or optional coverage of the temporomandibular joint (TMJ) and comprehensive occlusal principles. These disciplines must transition from tangential topics to essential, core competencies to ensure that the next generation of dentists can provide safe, effective, and patient-centered care.

1. The Unignorable Prevalence and Diagnostic Imperative

Temporomandibular Disorders (TMDs) are not rare conditions; they are widespread, constituting the most common cause of non-odontogenic orofacial pain. Recent cross-sectional studies confirm a high prevalence of TMD symptoms among the general population, with some regional studies even reporting prevalence as high as 61.2% among dental students themselves—a population under significant academic and psychological stress.[1,2] This demonstrates that virtually every graduate will encounter these conditions daily.

However, clinical practice cannot rely on self-reported symptoms alone. The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) is the current international reference standard, providing a reliable, dual-axis protocol for assessing both the physical (Axis I) and the psychosocial/behavioral dimensions (Axis II) of TMD.[3,4] Without mandatory, comprehensive training in applying the DC/TMD protocol, graduates lack the validated tools to accurately screen, diagnose, and differentiate these complex pain conditions from other orofacial pathologies. By failing to integrate this diagnostic standard into core education, we risk perpetuating antiquated, tooth-centric approaches and neglecting the essential biopsychosocial model of pain management.

2. Occlusion as the Cornerstone of Restorative Success

The argument for robust occlusal training transcends TMD management. Occlusion is the foundation upon which dentistry is built. A recent literature review emphasizes that achieving functional occlusion remains essential for minimizing complications and ensuring patient comfort, regardless of advancements in dental materials.[5]

When students lack a detailed understanding of force distribution, load management, and the dynamic interplay between the teeth, muscles, and joints, they are fundamentally unprepared to:

1. Design and Fabricate Durable Restorations: Improper occlusal contact can lead to premature failure, chipping,

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or fracturing of crowns, bridges, and implant-supported prostheses[6] and even relapse of orthodontic treatment.
2. Prevent Iatrogenic Issues: Unaddressed occlusal discrepancies created during routine restorative procedures can introduce harmful forces, leading to patient discomfort, parafunctional habits, and even new-onset TMD symptoms.
3. Manage Complex Cases: Advanced procedures like full-mouth rehabilitation or comprehensive orthodontic treatment demand predictive knowledge of how changes in the dental arches affect condylar stability and joint health.[7]

The current trend of siloed learning—where occlusion is taught separately from operative, prosthodontic, and orthodontic modules—must end. These principles must be integrated to show students that a successful restoration is one that is in harmony with the entire stomatognathic system.

3. The Path Forward: A Call for Global Curriculum Alignment

The following reforms should be embraced

1. Longitudinal Integration: We must embed TMJ and occlusion throughout the curriculum, from basic head and neck anatomy to advanced clinical treatment planning, rather than confining it to isolated modules.
2. Mandatory Clinical Competency: Mastery of the DC/TMD Axis I examination and essential occlusal analysis techniques (such as bite registration and occlusal analysis) must be mandatory, graded clinical skills.
3. Interdisciplinary Exposure: Students require exposure to the interdisciplinary management of TMD and complex occlusion, involving collaborations with physical therapists and pain specialists, to reinforce the contemporary biopsychosocial approach.[8]

The resistance to this necessary curriculum shift often cites time constraints or the perceived difficulty of the subject matter. However, viewing comprehensive occlusal and TMD training as a time cost is shortsighted; it is, in fact, an essential investment in future clinical efficiency and ethical practice. Students who graduate with this core competency will be far less likely to encounter expensive treatment failures, chronic pain cases, or medicolegal challenges later in their careers. This mastery of foundational biomechanics reduces the need for constant specialist referrals, enabling clinicians to manage a wider spectrum of patient needs safely and effectively, translating directly to cost-effective care. Furthermore, adopting internationally validated standards like the DC/TMD promotes global consistency in diagnosis and treatment philosophy, paving the way for robust international research collaboration and improved patient outcomes worldwide. Ultimately, providing patients with care that respects the complexity and integrated nature of the entire masticatory system builds invaluable professional credibility and patient trust, differentiating a merely skilled technician from a truly comprehensive doctor.

By transitioning the TMJ and occlusion from optional consideration to essential core knowledge, we empower future dentists to reduce iatrogenesis, effectively manage common conditions, and elevate the standard of patient care globally. The onus is on us, the students and researchers, to advocate for a curriculum that truly prepares us for the reality of clinical practice.

4. Conflict of Interest

None.

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