

Occlusal Stability

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KEYWORDS

- Occlusal • Stability • Fixed prosthodontic treatment
- Removable prosthodontic treatment • Implant prosthodontic treatment

KEY POINTS

- In dentistry, articulation is the static and dynamic contact relationship between the occlusal surfaces of the teeth during function.
- The exact maxillomandibular position at which maximum intercuspation should occur or be restored has been deliberated. Patients presenting with occlusal instability and tooth loss may require that a functional occlusion be reestablished. Understanding the accepted terminology and definitions in the *Glossary of Prosthodontic Terms* is essential before prescribing any particular occlusal scheme.
- The literature supports that bilateral mandibular manipulation, compared with gothic arch tracing or chin-point guidance is a clinical method to consistently record centric relation (CR).
- The 3 most likely temporomandibular disorders observed in clinical practice are occlusal-muscle disorders related to parafunction, internal joint derangements, and degenerative joint disease. It is important for the clinician to evaluate each patient for the range of motion during mandibular movement and observe signs and symptoms for a variety of the temporomandibular disorders.
- Selecting the occlusal scheme for dentate patients, or those requiring implant, fixed or removable prosthodontic care, should take into consideration the prevailing patient conditions and anticipated prosthetic needs to achieve occlusal stability.

INTRODUCTION

Occlusion is the foundation for clinical success in fixed, removable, and implant prosthodontic treatment.¹⁻⁵ Understanding those principles that determine its development is critical when restoring a patient's occlusion. The dynamic interface of the maxillary and mandibular occlusal surfaces has been studied for more than 3 centuries. During that time, the evolution of many philosophies, devices, and theories of occlusion has occurred, based on anecdotal clinical observations and applied

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geometric perceptions. Peer-reviewed journals and textbooks have reported these classic and contemporary occlusal concepts.⁶⁻²⁸ As evidence-based dentistry emerged, it championed a closer scrutiny of previously held beliefs, resulting in the abandonment of many pragmatic, yet beneficial occlusal procedures. The impetus toward scientific discovery, whereby factual information might be universally applied in both dental education and clinical practice, has created a renewed interest in occlusal studies.²⁹⁻³⁴

The American College of Prosthodontists formed a Task Force on Occlusion Education, consisting of prosthodontic educators and clinicians who represented the content experts, to reexamine what should be taught about occlusion.³⁵ Dental educators from universities across the United States were surveyed regarding the content and methodology of their occlusion curriculum. Also, the available scientific literature regarding occlusion was explored. Many occlusal studies were noted to be at the lowest level of hierarchal evidence, lacking randomization, bias controls, examiner blinding, or satisfactory statistical power, and so forth. Other areas were identified as having equivocal evidence or lack of agreement. It was concluded that occlusal concepts should be included in dental education and clinical practice when survey consensus occurred or when supporting scientific literature was discovered, resulting in the development of an occlusion primer.⁵ There remains a significant need for occlusion research to confirm educational constructs and to validate clinical procedures currently in use.

OCCLUSAL STABILITY

In dentistry, articulation is the static and dynamic contact relationship between the occlusal surfaces of the teeth during function.³⁶ Teeth make contact in a static manner during maximal intercuspation (MI), such as at the end of the chewing cycle or during deglutition or clenching. They may also contact in a dynamic manner during eccentric gliding tooth contacts, which occur during incising, the closing chewing cycle, or perhaps during bruxism. Condylar pathways, tooth guidance, and the overriding neuromuscular control determine mandibular movements, which affect the occlusal surfaces or interface.³⁷ As a result, the anatomic shapes of teeth, although genetically scripted, must morphologically and physiologically adapt to functional loading.

These tissue and organ adaptations vary by location and timing and can result in identifiable physiologic changes in the occlusal interface, which include tooth wear and pulpal and periodontal changes that affect the cementum and alveolar bone. Missing or worn teeth may alter the occlusal vertical dimension (OVD), posterior support, or anterior guidance (AG), which may be further compromised by mesial drift, malposed or tipped teeth, and aberrant eruption patterns.³⁸ Altered growth and development, congenital anomalies, or degenerative changes within the joints often create variant or discordant skeletal relationships and associated atypical occlusal contacts. In addition, airway obstruction, diet, erosion, and parafunctional habits generally affect tooth position, shape, and impending function.³⁹

Also, muscle and joint disorders can be the result of systemic disease, trauma, arthritis, and other processes unrelated to the dentition, yet may affect the occlusal interface by creating atypical tooth contacts. In the process, the patient's physiologic adaptive capacity for repair may be breached; this may lead to signs and symptoms within the neuromusculature and the temporomandibular joints (TMJs) that may culminate in a remarkable loss of occlusal stability.^{40,41}

The purpose of this article is for the clinician to recognize occlusal stability, which requires understanding normal occlusal relationships as well as appreciating the

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