

Occlusal Schemes and Philosophies in Full Mouth Rehabilitation - A Review

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Abstract: Occlusion restoration in patients with mutilated dentition is a difficult situation because each case is unique. Due to widely divergent opinions regarding the selection of an appropriate occlusal scheme, reconstructing worn - out dentition is complicated. Understanding the factors that influence the pattern or contours of occluding tooth surfaces is beneficial when planning for the maintenance of oral health and function. This is true whether we are preserving natural dentition or providing prosthesis for partially or fully edentulous patients. The goal of full mouth rehabilitation is not only to reconstruct and restore the worn out dentition, but also to maintain the overall health of the stomatognathic system. Full mouth rehabilitation should restore a state of functional and biological efficiency in which teeth and their periodontal structures, masticatory muscles, and temporomandibular joint (TMJ) mechanisms all function together in synchronous harmony. The aim of this article is to review briefly the various occlusal concepts, forms and schemes and philosophies in reconstructing worn out dentition to help overcome various difficulties occurring during full mouth rehabilitation.

Keywords: Full mouth rehabilitation, Occlusal concept, Occlusal philosophy, Occlusal wear

1. Introduction

The ultimate goal of full - mouth rehabilitation is to restore normal healthy function of the masticatory apparatus. Full - mouth rehabilitation seeks to convert all unfavourable forces on the teeth, which invariably cause pathological conditions, into favourable forces that allow normal function and, as a result, cause healthy conditions. [1] Occlusion is critical in establishing synchronous harmony between the components of the stomatognathic system i. e., teeth, masticatory muscles, and temporomandibular joints. As a result, the most important step in prosthetic rehabilitation of a patient with mutilated dentition is the selection of an appropriate occlusal scheme. Understanding occlusion requires knowledge and understanding of the physiology of the masticatory system, as well as insight into dysfunctional adaptation. [2] Following a thorough clinical examination and diagnosis of a patient with worn - out dentition, an appropriate occlusal scheme that not only restores the occlusal surface of teeth but also provides optimal muscle and joint function should be selected. [3] A thorough examination of the patient's diet, eating habits, and/or gastric disorders, as well as the current state of occlusion, is required for proper treatment planning. [4, 5]

Various classifications, [6, 7] have been proposed to classify patients requiring full mouth rehabilitation; however, Turner and Missirlian's classification is the most widely used. [8] According to them, patients with occlusal wear can be broadly classified as follows:

Category 1: Excessive wear with loss of vertical dimension of occlusion (VDO). The patient's closest speaking space is greater than 1 mm, and the interocclusal space is greater than 4 mm, with some loss of facial contour and drooping corners of the mouth. All teeth in a single arch must be prepared in a single visit so that the vertical dimension of

occlusion does not increase, allowing for better aesthetics control.

Category 2: There should be excessive wear with little or no loss of vertical dimension of occlusion, but be patient with the available space. Although the patient typically had a history of bruxism and paraoral habits, the vertical dimension of the occlusion is maintained by continuous eruption. Because of the shorter crown height, there may be difficulties with upheaving retention as well as resistance form; in this case, gingivoplasty is required. Slight reshaping of the superior surface of the tooth, i. e. enamel of teeth from the posterior segment of the opposing arch, may be beneficial in gaining some interocclusal space for restorative material.

Category 3: Excessive wear without loss of vertical dimension of occlusion, but with limited available space. In this category, there is extensive wear down of teeth in the anterior region over a long period of time, while there is less wear down of teeth in the posterior region. Centric relation and centric occlusion have a 1 mm closest speaking space and a 2–3 mm interocclusal distance.

In these cases, vertical dimension for restorative materials must be obtained. This can be achieved through orthodontic movement, restorative repositioning, surgical segment repositioning, and programmed OVD modification. The goal is to restore the tooth to its natural form, function, and aesthetics while preserving the physiologic principle in harmonious correlation with the adjoining hard and soft tissues, all of which improve the patient's oral health and well - being. [9]

Goals of full mouth rehabilitation [10]

- A static co - ordinated occlusal contact involving the maximum number of teeth in centric relation.
- An anterior guidance that is in accordance with the working side's lateral eccentric position

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- Disclusion of all the posterior teeth in protrusion during the anterior guidance
- Disclusion of all non - working inclines in lateral excursions.
- Group function of the working side inclines in lateral excursions

A few guidelines must be followed if the following goals are to be achieved. [11] They are as follows

- Requirement of reorganizing the occlusion
- Suitable occlusal scheme
- Change in occlusal vertical dimension
- Requirement of replacement of missing teeth
- The effects of the type of restorative material used on occlusal stability of TMD and parafunctional habits

The clinician must decide on the occlusal approach and an appropriate occlusal scheme after evaluating and classifying the patient's current clinical situation but before beginning the reconstruction procedure.

Occlusal Approach

Occlusal approach for restorative therapy can be either conformative approach (often advisable) or a reorganised approach.

a) In Conformative approach [12]

The occlusion is reconstructed based on the patient's existing intercuspal position. It is used when only a small amount of restorative treatment is required. It includes two situations:

- 1) Occlusion is not modified prior to tooth preparation. Though minor changes to restorations, such as the removal of non - working contacts, can be made.
- 2) Occlusion is modified before tooth preparation by localised occlusal adjustments such as shortening an opposing cusp, elimination of non - working side interferences, and removal of a deflective contact on the tooth to be restored.

b) In Reorganised approach [13]

New occlusal scheme is established around a suitable condylar position which is the centric relation position. If the existing intercuspal position is unacceptable and needs to be changed or when extensive treatment is to be undertaken to optimize patient's occlusion the patient's occlusion may be reorganised. [14] Complete occlusal scheme in modified and restoration provided in harmony with new jaw relation so as to:

- 1) Provide a reproducible starting point i. e. centric relation position
- 2) Provide an even, stable occlusion.
- 3) Provide an occlusion that is in harmony with functional movements.
- 4) Ensure that pathologic deflective contacts are not introduced.
- 5) Provide posterior stability to prevent anterior drifting

Reorganization may be considered when the existing intercuspal position is considered unsatisfactory for any of the following reasons

- 1) Repeated fractures of existing teeth or old restoration
- 2) Bruxism
- 3) Lack of interocclusal space for restoration

- 4) Trauma from occlusion due to excessive or abruptly directed forces.
- 5) Compromised function – unstable tooth contacts with tilting and supraeruption of teeth hampers mastication.
- 6) Compromised esthetics - change of clinical heights necessary to improve esthetics.
- 7) TMD
- 8) Developmental anomalies e. g. amelogenesis imperfecta.

There is no ideal technique to achieve this in every patient. There are 4 basic steps in harmonizing anterior guidance [15]:

- 1) Establish coordinated centric stops on all anterior teeth
- 2) Extend centric stops forward at the same vertical to include light closure from the postural rest position
- 3) Establish group function in straight protrusion
- 4) Establish ideal anterior stress distribution in lateral movements

Occlusal Schemes

According to the tooth contact condition, the ideal occlusion for eccentric movements can be classified into three schemes: mutually protected articulation, group function, and balanced articulation. For complete denture patients, the balanced occlusion concept is used, whereas for natural dentition, mutually protected occlusion and group function are used. [4] Each type has its own indication and contraindication. [16]

1) Mutually protected occlusion

The concept arose from the work of D'Amico, [17] Stuart, Stallard, [18] and Lucia, [19] as well as the members of McCollum's Gnathological Society in mid 1920s. Stallard and Stuart (1961) renamed mutually protected occlusion to ORGANIC OCCLUSION, which occurred when the centric relation and MIP coincided. In centric occlusion, the cusps of the posterior teeth should make contact, whereas in lateral excursions, only opposing canines should make contact, and in protrusion, only the anterior teeth should make contact. The posterior teeth have a cusp - to - fossa relationship. The anterior teeth disocclude by 25 microns.

2) Canine guided occlusion

Gysi introduced the canine protected occlusion scheme in 1915. D'Amico, [20] investigated the significance of cuspid teeth in 1958 and proposed the Concept of Canine Guidance (Canine Disclusion), in which the maxillary canine teeth guide the mandible during eccentric movements. It guides both lateral and protrusive movements of the mandible when in functional contact with the lower teeth. As a result, any force other than the axial loading is prevented.

3) Group Function Occlusion

The principles of group function occlusion were first introduced by Schuyler (1929). It is defined as multiple contact relations between maxillary and mandibular teeth in lateral movements on the working side, in which several teeth act as a group to distribute occlusal forces. The group function of the teeth on the working side distributes occlusal forces evenly across all teeth. During excursive movements, the posterior teeth on the working side make contact, but not those on the non - working side. Working contacts between the upper and lower buccal cusps are the only ones desired;

lingual cusp working contacts and posterior protrusive contacts are not. [21]

Occlusal concepts in Full Mouth Rehabilitation

There are two important basic steps which must be recognised in any technique. These are; a) Preliminary equilibration of occlusion and b) Establishment of incisal guidance. The fundamental principles of occlusion must be understood and followed, and specific goals must be visualised and achieved whenever possible. The objectives of the preliminary occlusal equilibration are: (1) To correlate centric occlusion with the unstrained centric relation, (2) To obtain the maximum distribution of occlusal stress in centric relation, (3) To retain the vertical dimension of occlusion, (4) To equalize the steepness of similar tooth inclines in order to distribute eccentric occlusal stresses evenly, (5) To establish smooth guiding tooth inclines, (6) To reduce the steepness of inclines of guiding tooth surfaces so that occlusal stresses may be more favourably applied to the supporting tissues, (7) To retain the sharpness of cutting cusps, (8) to increase the number and size of food exits, and (9) To decrease the size of the occlusal contact surfaces. Premature (deflective occlusal) contacts of balancing or nonfunctioning tooth inclines are one of the most damaging types of malocclusion. These contacts not only contribute to the premature loss of the involved teeth, but also to temporomandibular joint injury. Only on natural teeth is balancing cusp incline contact objectionable. [14]

1) Gnathological concept [22, 23]

B. B. McCollum graduated from dental school in 1907, and his desire to create the better the denture led him to broaden his search to include natural dentitions. In 1926, he coined the term "Gnathology" with Dr. Harvey Stallard, defining it as the science relating to the anatomy, histology, physiology, and pathology of the stomatognathic system, as well as treatment of this system based on examination, diagnosis, and treatment planning. McCollum founded the Gnathological Society in 1926. McCollum and Harlan pioneered the first positive method of locating the transverse horizontal axis and transferring the recording to an articulator using components from a Snow Facebow to describe the study and treatment of the entire mouth as a functioning unit. Their findings led to the development of mandibular movement principles, the transverse horizontal axis, maxilla - mandibular relationships, and an arcon articulator designed to accept the transfer of these records. The goal was to record maxillomandibular relationships that accurately reproduced border jaw movements and would recommend the best occlusal interface. With McCollum's assist, a gnathological concept was developed that clearly stated the importance of occlusion for patients who are completely or partially edentulous, as well as for patients who are completely dentulous.

The Gnathological Society established parameters that must be recognised, recorded, and comprehended. These parameters are determined by a variety of factors that are unique to each patient; some are modifiable by the restorative dentist, while others are fixed and constant for each individual and unchangeable in oral rehabilitation. Tooth shape and position (which includes compensating curves), vertical interarch dimension, anterior guidance, and

the occlusal scheme are all variables that can be influenced by the needs of restorative dentistry and aesthetics. The intercondylar distance, the hinge axis position, the condylar path as it moves in the glenoid fossa, and the relationship of the maxilla to the mandible are the constant factors that must be considered. When planning an oral rehabilitation and completing treatment, these represent individual characteristics that must be considered as they occur in the patient.

Gnathology's goal is to create an interference - free occlusion, which necessitates the concept of an organic occlusion, which includes occlusion, uniform centric contact, forces directed in line with the long axes of the teeth, tripodism, twin centric contact for cross tooth stability, narrow occlusal table, maximum cusp height, and fossae depth with supplemental anatomy.

2) Simplified occlusal design by Wilskott and Belser

According to this theory, force vectors acting on teeth are not only directed along the longitudinal axes of the roots, and thus occlusal contact locations do not determine the direction of functional forces. The stability of the teeth on the arch is primarily determined by the forces of eruption from the periodontium and the balance of the resting pressures of the cheek and tongue muscles. An occlusal design should take into account the variability of the guiding surfaces found in the temporomandibular joints. Occlusal contacts that do not serve a valid purpose may be removed, and the number of contacts per tooth may be reduced to one. Based on this, they proposed a simplified occlusal scheme in which: one occlusal contact per tooth, usually a cusp - fossa relation, all interproximal contacts should be proper and tight as they stabilise the tooth mesiodistally, anterior disclusion mechanics should be used so that posteriors do not experience any interference on lateral excursive movement, and anterior disclusion mechanics should be used so that posteriors do not experience any interference on lateral excursive movement, antero - posterior freedom of movement should be provided which is achieved by having concave internal slopes on the cusps of posterior teeth. [24]

3) Freedom in centric by Schuyller [25, 26]

The concept of 'Freedom in Centric' was first introduced by Schuyler, who supported the theory that the centric relation was more of a biological area of the TMJ than a point. Centric occlusion has long been thought to occur at a fixed point of occlusal contact between opposing teeth, in accordance with the accepted maxillomandibular relationship (a single precise position). Perhaps it would be more helpful to think of it as occurring in a specific area of the occlusal surfaces where the occluding tooth surfaces rest. As a result, the teeth would have a degree of eccentric freedom of movement before the inclined tooth surfaces influenced their relationship. It has been recognised that in the most retruded maxillo mandibular relation, a slight freedom of lateral and anteroposterior movement in centric occlusion is preferable to a locked intercuspation. This freedom of movement in centric occlusion improves patient comfort and reduces the risk of bruxism and other traumatogenic effects on the dentition's supporting structures.

In the functionally generated path technique, establishing freedom of movement in centric occlusion has been recognised as a critical factor. It is first established in the upper anterior teeth's incisal guide component. The lower anterior teeth make contact with a horizontal surface on the incisal guidance (the lingual surfaces of the upper anterior teeth), which allows for slight eccentric mobility before the effects of inclined planes of these surfaces take effect. This may differ slightly from the incisal guide pattern found in natural dentitions. Whether the functionally generated path technique or the articulating instrument itself is used in the final construction procedures, this area of horizontal freedom in the incisal guidance mechanism will ensure the desired freedom in posterior occlusal contours.

4) Pankey, Mann and Schuyler philosophy [27, 28]

Arvin Mann and L. D. Pankey quickly realised that creating a static model of the dynamic movement of mandibular function produced a matrix that could be used to design any occlusion in fixed and removable prosthodontics. They created the Pankey - Mann Oral Rehabilitation Technique. Their philosophy was based on the spherical theory of occlusion, Meyer and Brenner's "wax chew - in" technique, and D'Amico's discussion of the importance of cuspid teeth. When the opposing teeth come into functional contact, the canine teeth serve to guide the mandible during eccentric movements. When the upper canine teeth are in functional contact with the lower canines and first premolars, the mandible's lateral and protrusive movements are determined. When their opponents make contact during attempted eccentric movements of the mandible, they transmit the desirable periodontal proprioceptor impulses to the mastication muscles in a greater degree than any other teeth, reducing muscular tension and thus reducing the magnitude of the applied force. The Pankey - Mann - Schuyler technique takes a segmental approach to planning and completing oral rehabilitation. The lower anterior, upper anterior, lower posterior, and upper posterior teeth are all assessed, waxed up, and restored in order.

The incisal guidance was developed intra orally with acrylic resin in the PMS technique to meet aesthetic and functional requirements. The occlusion plan should follow the monsoon curve, and posterior mandibular teeth should be in sync with incisal / anterior guidance so that they do not interfere with posterior / condylar guidance. The functionally generated path technique (FGP) is used to develop the posterior occlusal surfaces of the maxilla after the mandibular restorations are completed. The best occlusal plane is chosen based on the curve of monson, and the mandibular posterior teeth are restored in harmony with the anterior guidance so that they do not interfere with condylar guidance. With "long centric" incisal guidance and group function in working excursion, the definitive restorations are equilibrated into a centric relation position with mandibular buccal cusps onto flattened fossae-marginal ridge contact, with mandibular buccal cusps onto flattened fossae-marginal ridge contact. The Pankey - Mann - Schuyler technique uses acrylic provisionals that are adjusted intraorally. The lower arch reconstruction is completed first before beginning work on the upper teeth. Because only one arch is restored at a time, discomfort is kept to a minimum. This technique has a lower chance of developing errors.

5) Twin - Table technique of Hobo [29 - 32]

Dr. Sumiya Hobo gave this advice, which is followed in the rehabilitation of dentate patients. The working condylar path is set on the articulator to move directly outward along the transverse horizontal axis to produce a neutral line in the twin - tables technique. A semi - adjustable arcon - type articulator with a box - shaped fossa element simulates the condylar path in use. Mount the maxillary study cast with a removable anterior segment after setting condylar guidance. Remove the maxillary anterior segment and eccentrically move the articulator to remove interferences that prevent a smooth, gliding motion. This procedure results in a cusp - shape factor that harmonizes with the condylar path. The anterior guidance in the Twin table concept is predetermined to create a harmonious disocclusion with the condylar path. Two different customised incisal guide tables are used in this technique. The incisal table without disocclusion is the first incisal table. It is accomplished by fabricating die systems with removable anterior and posterior segments, which allows for uniform contact in the posterior restorations during eccentric movements. The other incisal table is made by placing 3 mm plastic separators behind the condylar elements so that the articulator can simulate border movements. This is termed as the incisal guidance with disocclusion. The first incisal guide table aids in the fabrication of posterior tooth restorations. To achieve incisal guidance with disocclusion, the second guide table is required. Using the twin - tables technique, the final prosthesis results in a restoration with a predictable posterior disocclusion and anterior guidance that is in alignment with the condylar path.

6) Twin Stage technique by Hobo and Takayama [32 - 34]

As an advanced version of the Twin Table technique, the Twin Stage procedure was created. Condylar guidance and anterior guidance are primary determinants of occlusal rehabilitations, according to the literature. This technique, proposed by HOB0 and TAKAYAMA for the rehabilitation of a severely worn dentition, describes the method of reorganising an occlusion using the cuspal angle as the primary determinant. The condylar path has long been thought to be an important determinant of occlusion. According to Hobo and Takayama, however, the condylar path has been shown to deviate and has a minor impact on disocclusion. The amount of disocclusion increased by only 0.020 mm during protrusion, by 0.015 mm on the nonworking side, and by - 0.002 mm on the working side, with each degree of rise in the horizontal condylar guidance. As a result, the cusp angle and anterior guidance are more important determinants for achieving a disocclusion, and with these average angulations of the horizontal condylar guidance, a mutually protected occlusion can be successfully achieved. Despite being independent of both the condylar and incisal paths, a standard value for cusp angle was established in order to compensate for natural dentition wear caused by caries, abrasion, and restorative work. It was possible to determine the standard amount of disocclusion by using the standard cusp angle.

7) Nyman and Lindhe scheme for severely advanced Periodontitis [35]

When the patient occluded in the intercuspal position, the occlusion was designed so that there was an even and

simultaneous contact all over the dentition (IP). This means that the masticatory muscles' forces kept the bridge in a balanced and stable position. The occlusion was also designed to achieve intermaxillary contact simultaneously over the various areas of the bridge during lateral mandibular excursions. This means that all precautionary measures were taken to prevent the bridge from tilting. The movements between RP (retruded contact position) and IP, as well as IP and protruded contact position, were designed using the same balanced occlusal pattern.

8) Youdelisscheme [36]

In 1971, Youdelis proposed an occlusal scheme for patients with advanced periodontitis. The goal was to achieve axially directed forces and simultaneous interocclusal contact of posterior teeth in a centric relation position (usually coincident with intercuspal position). Protrusive excursions require anterior disclusion, while lateral excursions require canine disclusion. Because of the arrangement of the cuspal anatomy, if the canine disclusion is lost due to wear or tooth movement, the posterior teeth fall into group function. Articulators that are fully adjustable as well as semi - adjustable can be used.

2. Discussion

The absence of contact on any posterior teeth in any position other than centric relation is referred to as posterior disclusion. It's simple to achieve with cusp tip - to - fossa morphology. It must also be accomplished with tripod or surface - to - surface morphology to avoid lateral interferences in any situation where centric contact is required on inclines steeper than the mandible's lateral border movements. There are two techniques of accomplishing posterior disclusion:

- The anterior guidance is first synchronised with functional border movements, and then the posterior teeth's lateral inclines are disoccluded by proper anterior guidance.
- The posterior teeth are established first and then disoccluded by developing the anterior guidance. This method is backward. Anterior guidance is an important guiding factor in the development of posterior occlusal form and should be developed early on. When the anterior guidance is determined by the posterior occlusal form, the accuracy of the anterior guidance is questioned.²¹

Whereas anterior guidance anterior group function and cuspid protected occlusion can be used to develop posterior disclusion. In lateral excursions, cuspid - protected occlusion is defined as disocclusion by the cuspids of all other teeth. It's usually the foundation of what's known as mutually protected occlusion. [17] Lucia (1961) described advantages of a mutually protected occlusion as the following¹⁹

- A cusp to fossa relationship causes upper and lower components to interlock, providing maximum centric support in all directions.
- The force is clearly closer to the long axis of each tooth.

- The marginal, transverse, and oblique ridges are arranged in a shearing action, resulting in a more efficient chewing apparatus.

Patients whose periodontium is compromised cannot receive mutually protected occlusion. While occlusion of group functions has the following benefits: a) The teeth on the working side evenly distribute occlusal stress. b) Nonworking interferences are not subjected to destructive, obliquely directed forces because there is no contact on the nonworking side. c) Horizontal pressures are distributed to one half of the arch on the working side during lateral movements. d) It also protects centric holding cusps, such as the buccal cusps of the mandible and the palatal cusps of the maxilla, from excessive wear.

Condylar guidance does not dictate anterior guidance, according to Pankey, Mann Schyuler's philosophy. As a result, it recommends that the anterior guidance be developed for the best possible aesthetics, function, and comfort. The benefits of this technique include the ability to diagnose and plan treatment for the entire rehabilitation before preparing a single tooth, it is a well - organized, logical procedure that moves along smoothly, there is never a need to prepare or build more than 8 teeth at a time, there is no risk of losing the patient's vertical dimension, and all posterior occlusal forms are in harmony with the anterior occlusal forms. [21]

The working condylar path was influenced by anterior guidance, according to Hobo and Takayama, who concluded that they were dependent factors. According to them, posterior disclusion is caused by the angle of hinge rotation created by the angular difference between the anterior guidance cusps, which aids in the management of potentially harmful non - axial forces. They came to the conclusion that the cusp angle is the most reliable factor of occlusion because it does not deviate and is four times more reliable than the condylar and incisal paths, which vary. Despite being independent of both the condylar and incisal paths, a standard value for cusp angle was established in order to compensate for natural dentition wear due to caries, abrasion, and restorative work. [30, 31]

It was possible to determine the fixed amount of disclusion by using the standard cusp angle. Molar disclusion during eccentric movements is effective in eliminating harmful lateral occlusal forces, and the anterior teeth, being the furthest from the fulcrum, are least influenced by the varying amount of flexion caused by the closing musculature, and thus are in the best position to carry the load. Interferences in protrusion are the most damaging, so posterior teeth contact should be avoided during incising, especially in protrusive movements.

Even contact should be provided in the intercuspal position for extremely advanced periodontitis cases, according to Nyman and Lindhe Scheme, though no emphasis is placed on the type of contacts.¹⁷ Anterior disclusion should be achieved when distal intercuspatation is available. Before beginning the treatment procedure, determine whether a full mouth simultaneous technique is required, which advocates the restoration of both arches at the same time, or a

quadrant/segment technique, which requires the completion of one quadrant in a planned sequence before moving on to the next. [35, 37]

When using the segmented simultaneous technique, the desired features of full mouth simultaneous rehabilitation and the programmed quadrant approach are combined into a single reconstructive technique. This technique simplifies basic reconstruction procedures while allowing the dentist to use an appropriate occlusal scheme and philosophy for each patient. Finally, after thoroughly reviewing the existing clinical condition, the clinician must choose an appropriate occlusal scheme for a specific reconstruction case in order to achieve predictable long - term results and a functional occlusion.

3. Conclusion

Occlusal rehabilitation is a major procedure that should be carried out according to the dentist's treatment plan, which is based on his knowledge of various treatment philosophies and clinical skills. The principles of treatment are universal, all functional factors are interrelated, and every effort should be made to create an occlusal interface in which the periodontium of teeth, mastication muscles, and TMJs all work in harmony. This necessitates a precise diagnosis of the deranged condition's aetiology, intra - oral changes, and other negative effects on jaw relations. To validate occlusal treatment theories, more scientific research and systematic reviews are required. Finally, the clinician must assess and evaluate the literature as well as his or her own clinical experiences. Modern oral rehabilitation techniques can restore both function and health to severely deteriorated, diseased mouths. Because the success of rehabilitation procedures was dubious in the past, some of these "dental cripples" were sentenced to full - mouth extraction and complete dentures. However, recent advancements in dental technology, materials, and equipment have made the task of rebuilding, restoring, and rehabilitating diseased mouths much easier. Dentists have been able to save many teeth that would have been lost otherwise.

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