

# COMPLETE ORAL REHABILITATION- AN OVERVIEW

\* Vivek V Nair

\*Professor, Dept. of Prosthodontics, Govt Dental College, Trivandrum. | Corresponding Author: Dr. Vivek V Nair, Email: drvivekmds@rediffmail.com

## **Abstract:**

*Restoration of efficient masticatory function through complete mouth rehabilitative procedures embraces the re-establishment of harmonious relationships within the limits dictated by the anatomical and physiological factors affecting the temporomandibular joint. Today, the profession has advanced to the point where sound theories are applicable and practical techniques are available. It is therefore possible for the dental practitioner to rehabilitate completely the mouth, with assurance and confidence that the rehabilitated dental apparatus can be maintained in a state of health and functional efficiency over an extended period of time. The aim and endeavor, therefore, is reconstruction and rehabilitation of the whole, satisfying all the related factors, including the health of the periodontium, vertical dimension and free way space, balanced functional occlusion and the esthetic requirements.*

## Key words:

Oral rehabilitation, occlusal rehabilitation, Oral reconstruction, Full mouth reconstruction

## INTRODUCTION

To rehabilitate means 'to restore to a former capacity. Oral rehabilitation is the restoration of the form, function, and esthetic qualities of the masticatory mechanism. The rehabilitation of a mouth therefore, can be the satisfactory placement of a single restoration, or it can encompass the rebuilding of the remaining teeth and replacing of any number of missing teeth. Perhaps the best term to designate extensive restorative treatment that involves most or all of the teeth and that is accomplished according to sound anatomic and physiologic concepts might be 'complete oral rehabilitation'. A patient who suffers from any of the conditions requiring the rebuilding of his dental arches deserves the best his dentist has to offer. Since the successful handling of such patients may depend on the degree of accuracy with which the operator can capture and utilize the highly individual functional characteristics of the patient's masticatory mechanism, the dentist should use the most nearly faultless techniques and machines within his capabilities. The four prime objectives of oral rehabilitation are optimum oral health, functional efficiency, mouth comfort and esthetics.

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## Indications

1. Loss or large amounts of tooth structure necessitating the replacement or restoration of most or all of the dentition
2. Temporomandibular joint disturbances that can be attributed to the patient's faulty occlusion
3. The treatment of periodontally diseased mouths in which defective occlusion seems to play a major role as a contributing factor

## Contraindications

1. Frequently, friends and relatives of one's rehabilitation patients will request similar treatment. There are many malfunctioning mouths that do not need extensive dentistry and have no joint symptoms. These cases are best left alone.
2. Some mouths that have the potential to break themselves down, never actually produce the destruction, for some reason.

## Fundamental of complete mouth rehabilitation

The entire concept of complete Oral Rehabilitation as practiced today is dependent basically upon three proven and accepted principles, namely

- a. The existence of the physiological rest position of the mandible which is a constant
- b. The recognition of a variable vertical dimension and
- c. The acceptance of a dynamic functional centric occlusion

## Functional analysis of occlusion

A functional analysis of occlusion is pertinent to the formulation of a proper plan of treatment for complete mouth rehabilitation. It must include:

1. Determination of the proper vertical height by utilizing the physiological rest position of the

mandible as a guide and noting the existing functional free way space.

2. An examination and study of the path of closure from rest position to the physical contact position of the teeth noting whether condylar displacement occurs.
3. An analysis of functional occlusion must include the effects of the occlusal pattern upon the periodontal structures.
4. An analysis of the temporomandibular joint positioning relative to the occlusal pattern by means of roentgenographic studies.

## PANKEY-MANN – SCHUYLER PHILOSOPHY OF COMPLETE OCCLUSAL REHABILITATION

Utilizing the "principles of occlusion" espoused by Dr. Clyde Schuyler, Dr. Pankey integrated different aspects of several treatment approaches into an orderly plan for achieving an optimum occlusal result with minimum stress on the patient or the dentist. Since its inception, the philosophy has had as its goal the fulfillment of the following principles of occlusions as advocated by Schuyler.

1. A static coordinated occlusal contact of the maximum number of teeth when the mandible is in centric relation
2. An anterior guidance that is in harmony with function in lateral eccentric positions on the working side.
3. Disclusion by the anterior guidance of all posterior teeth in protrusion
4. Disclusion of all non-working side inclines in lateral group function of the working side inclines in lateral excursion

## Sequence of treatment

- i. Examination, diagnosis, treatment planning, prognosis

- ii. Harmonization of the anterior guidance for best possible esthetics, function, and comfort
- iii. Selection of an acceptable occlusal plane and restoration of the lower posterior occlusion in harmony with the anterior guidance in a manner that will not interfere with condylar guidance
- iv. Restoration of the upper posterior occlusion in harmony with the anterior guidance and condylar guidance

## Advantages

1. It is possible to diagnose and plan treatment for the entire rehabilitation before a single tooth is prepared
2. It is a well-organized, logical procedure that progresses smoothly with less wear and tear on the patient, operator, and technician.
3. There is never a need for preparing or rebuilding more than eight teeth at a time.
4. It divides the rehabilitation into separate series of appointments. It is neither necessary nor desirable to do the entire case at one time.
5. There is no danger of 'getting lost at sea' and losing the patient's present vertical dimension. The operator knows exactly where he is at all times.
6. The functionally generated path and centric relation are taken on the occlusal surface of the teeth to be rebuilt at the exact vertical dimension to which the case will be constructed
7. All posterior occlusal contours are programmed by and are in harmony with both condylar border movements and a perfected anterior guidance.
8. There is no need for time-consuming techniques and complicated equipment.
9. Laboratory procedures are simple and controlled to an extremely fine degree by the dentist.

## THE PANKEY-MANN PHILOSOPHY

Contrary to the cuspid protection of Stuart's theory, this concept states that cuspid guidance is important and builds the upper and lower cuspids to normal intercuspal function. This may necessitate the resurfacing of the worn lingual surfaces of the upper canines, so that as the mandible functions at interocclusal level, and at a pre determined vertical height, the angulations of the lingual surfaces of the upper cuspids serve as guides in carving the posterior wax patterns of the upper teeth. First, the lower occlusal curve is established by scribing a radius with a sharp knife into the lower plaster teeth and then building lower posterior wax patterns, which will conform to this radius. These patterns are then cast and are inserted. The upper posterior occlusion is then fabricated by a functional technique using the upper cuspids as guides. In the completed work, an acceptable working bite is established with multiple simultaneous cuspal contacts on all the posterior teeth. The balancing bite has original multiple simultaneous cuspal contacts, but these are freed slightly before the work is inserted.

## Disadvantages

1. In the Pankey- Mann technique only voluntary movements on the horizontal plane are recorded. Functional movements on the horizontal plane with food in the mouth are recorded. Neither voluntary or functional movements in the frontal or sagittal planes are recorded.
2. The upper cast is placed in centric occlusion with the lower cast in the Pankey- Mann technique. In all total reconstruction techniques, it is important to relate the mandible to the maxilla free from cuspid guidance. This does not take place if the casts are occluded by placing them together as you would if they were in your hands. To occlude the casts in the same manner in which the patient presents them can create grave errors in total rehabilitation

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3. If this technique is adhered to, an average of 1.5mm of tooth structure is removed occlusally from all the teeth. This seems to be far from conservative.

4. After establishing the desired 'cuspid rise', just before the functional chew-in, nothing is touching back of the cuspids. When hard food is crushed, the greatest leverage is in the region of the molars. With no posterior contact, the condyles may be pivoting around the cuspids as an anterior axis of rotation

5. A chewed in occlusal or incisal plane can be different for each rotational axis about which the mandible is guided. The probability of incorrect control of the anterior incisal plane, if guided by the cuspids alone, the incisors may be too short. This may result in poor esthetics.

## TREATMENT PLANNING SEQUENCE FOR OCCLUSAL REHABILITATION

The whole treatment plan should be formulated on the approach to the total human being. The three basic phases of treatment are the elimination of pathology, functional repositioning and restoration of teeth to optimum form and function, and replacement dentistry. At different stages, depending upon the proficiency of the operator, he may require consultation with various specialists in order to determine the optimum treatment plan. This treatment plan should be predicated to retain the maximum natural dentition for the normal individual life span, comfortably, usefully, healthfully and esthetically. The following sequence in treatment planning may be helpful in occlusal rehabilitation.

### I. Removal of indicated teeth

- A. Infected
- B. Impacted
- C. Malpositioned, only when required for improved prognosis

### II. Periodontal treatment

- A. Instrumentation

### B. Surgical procedures

- i. Pocket elimination
- ii. Reattachment
- iii. Bone contouring
- iv. Frenectomies and muscle attachment

### III. Endodontic treatment

### IV. Consideration of Maxillo-mandibular relationship

#### A. Bruxism and habit patterns

- i. Education (retraining of habits)
- ii. Medication
- iii. Protective appliances

#### B. Realignment of arches to proper form and function

- i. Adult orthodontics

#### C. Occlusal equilibration and recontouring of teeth to reduce strain and compensate for minor alignment deviation

#### D. Evaluation of vertical dimension

- i. Do not change unless absolutely indicated and then preferably after trial period with splints.

### V. Re-evaluation of treatment planning

### VI. Preparation of necessary teeth in quadrant or complete arch to conform with your techniques

- i. Carious teeth
- ii. Old deficient restorations
- iii. Food impaction areas
- iv. Overhanging restoration margins
- v. To improve form and function of arches
- vi. Conservation of tooth structure

### VII. Treatment of preparations and base restorations

### VIII. Making impressions and records as

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required

IX. Placing temporary splints or replacements

X. Re-evaluation of treatment planning

XI. Laboratory procedures

A. Replacement of missing teeth, preferably with fixed partial prosthesis

B. Splinting of retained teeth if necessary

XII. Try-in restoration

A. Check esthetics

B. Check phonetics

C. Check proximal contacts

D. Check margins; clinically and with x-rays

E. Check occlusion

F. Check vertical dimension

G. Repolish restorations

XIII. Cementation

XIV. Finish case

A. Recheck as in XII above

B. Perform prophylaxis and thoroughly polish restorations

C. Preventive treatment-topical stannous fluoride, if indicated

D. Desensitize sensitive teeth

E. Make post-treatment roentgenograms, models and photographs

XV. Post-presentation of case

A. Review original problems

B. Compare pre and post-treatment roentgenograms, models and photographs

C. Review patient education and instructions

D. Case completed but never dismissed

XVI. Estimate duration of treatment and patient investment

A. Use due consideration for yourself and

your patient

B. Add a contingency factor so that estimate will not be changed

## METHOD OF TREATMENT

One of the most common method by which we treat the complete oral rehabilitation is by the quadrant dentistry method. Extreme skill is necessary if total treatment is to be accomplished by the quadrant dentistry method. Very careful equilibration of the existing occlusion must be completed first. This may be difficult to expedite, because teeth shift, making it necessary to repeat the procedure several times. Then each quadrant of dentistry must be perfectly executed. When all four quadrants are completed, further equilibration is usually necessary. Any adjustment in the mouth is difficult and cannot be accomplished as accurately or as easily as on an articulator.

The patient's temporomandibular movements must be accurately recorded and duplicated in minute detail. Before the preparations are made, it is necessary to determine which cusps are essential and approximately where they will be located. This is extremely important because it will influence the type of preparations to be used. How the teeth interdigitate will determine whether full coverage or onlays are indicated. The veneer materials available today are a poor substitute for nature's enamel and will never take its place. The best-made restorations that are adjacent to gingival tissue can only be irritants.

The practical treatment of a case necessitates the completion of all the preparations of the teeth involved. Usually this cannot be accomplished at one sitting, nor should it be done that way. So, we have to construct temporary restorations for each quadrant as we proceed. Because of improvements in our techniques and materials, it is now possible to temporize most cases with acrylic splints-either processed or autopolymerized. Splinted together, they also tend to maintain the

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status quo in the interim required for laboratory procedures. When all four quadrants are prepared, the master impressions are taken, and these casts are accurately related to the articulator by means of a face-bow and a centric interocclusal record. The prepared teeth will have the exact relation on the articulator that they have in the patient's mouth. Quadrant impressions are taken as each quadrant is prepared, and the quadrant casts made from these impressions will be used for final margin and contact adaptation of the wax patterns. Now an articulation is developed in wax on the master casts on the articulator. The characteristics of the articulation will be a harmonious arrangement of the occlusal surfaces that will follow the movement of the temporomandibular joint. The anterior teeth –overbite and overjet–will be coupled with the posterior occlusal surfaces. The wax patterns will be separated, transferred to the quadrant dies, and the margins adapted. The patterns will then be cast and metal framework prepared for trial in the mouth.

Regardless of how carefully and accurately we work or think we work, these castings are far from the finished product that the patient will wear. The errors incorporated in cutting the wax patterns and transferring them to individual dies, the investing and casting errors, the material errors–all add up unbelievably. It therefore becomes necessary to correct the restorations before they can be worn. Each restoration is carefully fitted to each tooth and to each other restoration. After the restorations have been fitted satisfactorily, we do a 'remounting'. This means that accurate casts containing the restorations are placed on the articulator in the same relation that they had in the mouth. This step is accomplished by means of a face-bow transfer and a centric interocclusal record. The restorations are then carefully adjusted until they exhibit the same characteristics and relation to each other as the wax patterns on the master casts. When this has been accomplished, the restorations are ready to be worn temporarily

by the patient.

There are several reasons for temporary wearing of the restorations. Healing of the supporting structures of periodontally involved teeth will frequently produce a slight change in the positions of the teeth and their restorations. Malfunctioning joints often heal after proper function with the result that there is a slightly different relationship patients, after over coming long imposed neuromuscular patterns of malfunction, will more readily give us a accurate joint relationships. If the restorations are temporarily cemented, they can be removed without difficulty for slight adjustments to perfect he case. In very bad periodontal or joint cases, it is often necessary to have half a dozen remountings over a period of several years before real success can be achieved.

## DISCUSSION

The objective of complete mouth rehabilitation is the reconstruction, restoration and maintenance of the health of the entire oral mechanism. The accomplishment of this goal requires an understanding and utilization of all this goal requires an understanding and utilization of all the available dynamic potential. This is opposed to a static approach which recognizes the existence of the various functional elements of mastication but fails to integrate all these components into a single structural unit. The technique of rehabilitation through simple occlusal reconstruction, where in each tooth is considered as an individual entity, and where in the over all pattern of mastication is neglected, is a static approach. The importance of the functional factors of proper vertical dimension, adequate freeway space, and balanced functional occlusion are disregarded, and as a result, an effective restoration is not achieved. This type of rehabilitative procedure does not consider the important physiological factors basic to mastication, and consequently, the procedures are merely a mechanical reconstruction. Thus, the correction of those elements responsible for

the correction of those elements responsible for the masticatory breakdown remain unchanged, and the restoration of the dental organ to a state of functional efficiency is not realized. Complete mouth rehabilitation is a dynamic functional problem, and embodies the correlation and integration of all the component parts into one functioning unit. The aim and endeavor, therefore, must be reconstruction and rehabilitation of the whole, satisfying all the related factors.

## **CONCLUSION**

1. The science of complete mouth rehabilitation rests upon three proven and accepted fundamentals. The existence of a physiological rest position which is a constant; the recognition of a variable vertical dimension, and the acceptance of a dynamic functional centric occlusion.
2. An occlusion can be considered to be in an ideal state of centric occlusion when the opposing teeth enter into a state of proper intercuspation at an acceptable vertical height, with adequate functional free way space and where in no condylar displacement occurs when the mandible travels from its position of centric relation to centric occlusion
3. A functional analysis of the occlusion is pertinent to the formulation of a proper plan of treatment for complete mouth rehabilitation
4. In prosthodontic rehabilitative procedures through the restoration of lost vertical dimension and the re-establishment of a balanced functioning occlusion the mandible is not repositioned, but the existing displacement is eliminated.
5. In rehabilitative procedures the endeavor should be to reproduce nature at the age that the patient is presented for treatment.
6. The prime concern in the rehabilitation of the masticatory apparatus is not only the restoration of the functional mechanism to a state of health but the maintenance and perpetuation of this state of health.