

# Don't Believe What You See in Mouth, Listen To Condyles-A Systemic Review

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## Abstract

Centric relation, static and dynamic occlusion are less talked about than its actual importance in dentistry. Their relevance to different disciplines of odontology (general dentistry, conservative dentistry, orthodontics, prosthodontics, dental technicians) has been well documented. Numerous articles in scientific literature regarding the importance and necessity of interdisciplinary teamwork in dentistry to correct problems associated with occlusion has been documented. The centric occlusion and centric relation (CO CR) discrepancy is multifactorial with a degree of psychogenic influence varying throughout an individual's life with phases of symptoms affecting the quality of life. The current review highlights role of various disciplines in rectifying problems relating to discrepancy in centric occlusion and centric relation.<sup>1</sup>

## 1. Introduction

At every level of general practice, a dentist routinely faces problems of sore teeth, excessive wear, loose teeth, Temporomandibular Joint (TMJ) disorders and orofacial pain. A dentist who does not have a working knowledge of occlusal principles must resort to guesswork and time-wasting trial and error attempts to solve problems<sup>2,3,4</sup>.

Gnathologists and restorative dentists have suggested using centric relation to provide a stable and reproducible position to reconstruct the dentition. In recent years, an increased number of dentists desiring to achieve a treatment result wherein the upward and forward or a seated position of the condyle is maintained when the patient closes the mandible to the Intercuspal Position (ICP). Most dentists who look carefully at this joint-to-dentition relationship would agree that the larger the discrepancy between the seated condyle and tooth

intercuspal pretreatment, the more difficult it is to achieve the desired result<sup>4,5</sup>.

## 2. Why Centric Relation?

Experience with balanced occlusion has taught that unless the maximum intercusping of the teeth is coincident with centric relation of the mandible in the terminal hinge closure, restorations will not work in the mouth as they did on the articulator<sup>6,7</sup>.

In India concept of checking for interferences in balancing and excursive movements in all patients is lacking resulting in faulty prosthesis and restorations which ultimately affects TMJ and the life of restoration.

Okeson said of centric relation that the "most orthopedically stable joint position is when the condyles are in their most superior anterior position in the articular fossa, resting against the posterior slopes of the articular eminences, with the articular discs properly interposed<sup>7</sup>.

### 3. Need for to Rectify CO-CR Discrepancy

Need for rectifying CO-CR discrepancy was highlighted by Ronald H. Roth in his articles on functional occlusion. According to roth need for stability after orthodontic cases partially relied upon functional occlusion<sup>5,8,9</sup>.

It was then considered necessary to de-programme every case using splint therapy. The dental casts in centric relation on a semi adjustable articulator aided in the diagnosis of the malocclusion. This revealed a malocclusion that is more severe than that seen with teeth in maximum intercuspation<sup>5,8,9</sup>.

Teeth with initial occlusal discrepancies (Figure 1) have significant deeper initial probing depths, worse prognoses, and worse mobility<sup>10</sup>.

By increasing the vertical dimension and separating the posterior teeth, the occlusal interferences to centric occlusion are removed. In the presence of signs and symptoms of temporomandibular dysfunction, a full arch appliance is indicated to limit loading on the joint. These

approaches attempt to allow the muscles to relax and allow the condyles to seat more superiorly and anteriorly to reveal the true discrepancy between the mandibular position in centric occlusion and maximum intercuspation (Figure 3). After finishing it was advocated to use gnatho-positioners to settle in centric<sup>11,12,13</sup>.

These removable intra-oral appliances are considered necessary in cases when there is evidence of clinically significant masticatory impairment with documented pain and/or loss of function. Only oral splint (Figure 2) appliance is considered medically necessary for TMD/TMJ therapy<sup>14</sup>.

The clinical procedure is not a single-day entity, but instead survival on a long-term basis. The clinical longevity of our work is dependent on so many factors and when we have a closer look, all these ultimately depend on the occlusal stability. The restorative dentist must follow the dictates of condylar guidance, and place the cusps properly and construct an anterior guidance that is in harmony with condylar guidance<sup>15</sup>.

PRE RX



**Figure 1.** Teeth with initial occlusal discrepancies.

REPOSINING SPLINT



**Figure 2.** Oral splint Appliance.

POST SPLINT



**Figure 3.** True malocclusion with condyles seated in fossa.



**Figure 4.** Face bow transfer for centric mounting.

It is important that any case involving an occlusal scheme change start with asymptomatic joints. The joints should be pain-free when firmly loaded with bimanual manipulation, and function without pain from a disk derangement<sup>5,14</sup>.

Significant number of practitioners have, for years, advocated mounting (Figure 4) study models in centric relation. These practitioners, along with recent texts, state that it is not an optional step to be taken on some patients, but a necessary step to be taken on all patients, whether young or adult, because it is not possible to accurately predict which cases need to be mounted<sup>15</sup>.

## 4. Rectifying Co-Cr Discrepancy

Presence of occlusal interference is widespread in all population groups, and that there are more people with non-ideal functional occlusal relationships than people with signs and symptoms of functional occlusal disorders. Possible consequences of occlusal interference, such as bruxism and toothwear and relapse of tooth position may also occur sometime after dental treatment<sup>16,17</sup>.

Splint wear prior to restorative dentistry and orthodontics is indicated when:

1. The patient exhibits signs and symptoms of TMD;
2. Difficulty is experienced in recording RCP/ CR;
3. As a routine, prior to full mouth reconstruction orthodontics, and orthognathic surgical procedures;

The patient cannot perform reproducible pantographic tracings/mandibular movements. Splint wear is continued until:

1. Signs and symptoms of TMD have been alleviated;
2. A stable, comfortable, repeatable jaw position has been achieved (as evidenced by stable occlusal contacts on the splint for three months);

The patient can perform reproducible pantographic tracings/mandibular movements. After checking the patient intraorally, if the patient will not make gliding excursions into protrusive and keep the anterior teeth in contact, you are sure that posterior interference exists. Also if patient cannot make lateral excursions and keep the cuspids together or the patient will not readily allow mandibular manipulation interference exist. Individual tooth positioning needs to be gauged so that they can

be moved to achieve an ideal anatomical and functional goal. For this Occlusal equilibration is done. Post treatment cases should not be equilibrated until growth has been completed. The changes with growth are likely to alter the results of equilibration. In orthodontics gnatho-positioners are used to settle occlusion in centric occlusion<sup>18-20</sup>.

## 5. Goals of Equilibration<sup>11</sup>

1. To establish a positive one-place closure in which centric relation and occlusion are one and the same with equalized occlusal stops for all posterior centric cusps.
2. To establish proper coupling of anterior teeth and as ideal as possible anterior guidance for posterior disocclusion
3. To organize the posterior occlusion so as to harmonize ridges and groove direction with mandibular border movements.
4. To maintain maximum cusp height
5. To remove a minimum amount of tooth material
6. To achieve stability of centric relation.

These techniques predictable and have proven to be faster, easier, less expensive, and more accurate.

## 6. Conclusion

From the fixed prosthodontist restoring several quadrants at a time, to the removable prosthodontist fabricating complete dentures, to the oral surgeon positioning the mandible and condyle during orthognathic surgery, the common thread is the determination and attainment of a concentric, stable, repeatable condylar position. It is time for the all dental professionals to accept this standard as a treatment goal and to embrace the instrumentation that makes assessment of this position possible.

## 7. References

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