

## Horizontal Jaw Relation

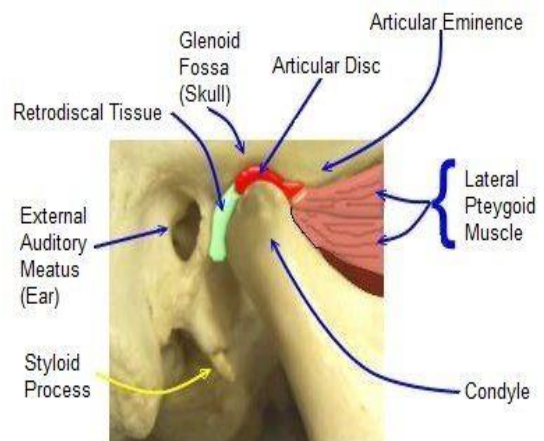
It is the relationship of the mandible to the maxilla in a horizontal plane. It can also be described as the relationship of the mandible to the maxilla in antero-posterior and side-to-side direction.

The horizontal relations include:

- 1- Centric jaw relation.
- 2- Eccentric jaw relations: Any relationship between the jaws other than centric relation.
  - A. Protrusive or forward relation: The relation of the mandible to the maxillae when the mandible is thrust forward.
  - B. Left or right lateral relation: The relation of the mandible to the maxillae when the lower jaw is in a position to either side of the centric relation.

### Centric jaw relation:

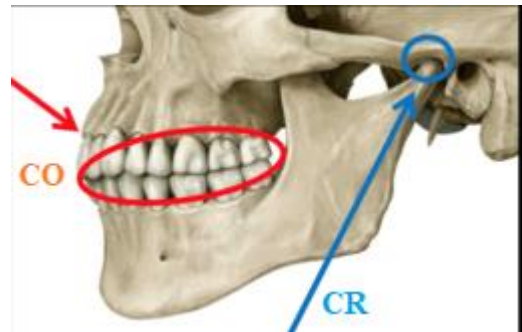
It is the maxilla-mandibular relationship in which both condyles articulate with the thinnest avascular portion of their respective disks with the complex in the anterior-superior position against the shapes of the articular eminencies. This position is independent of tooth contact. This position is clinically discernible when the mandible is directed superiorly and anteriorly, and from which the individual can make lateral movements at a given vertical dimension. It is restricted to a purely rotary movement about the transverse horizontal axis.



OR; It is a clinically determined relationship of the mandible to the maxilla when the condyle disk assemblies are positioned in their most superior position in the mandibular glenoid fossae and against the distal slope of the articular eminence (*it is a bone-to-bone relationship*).

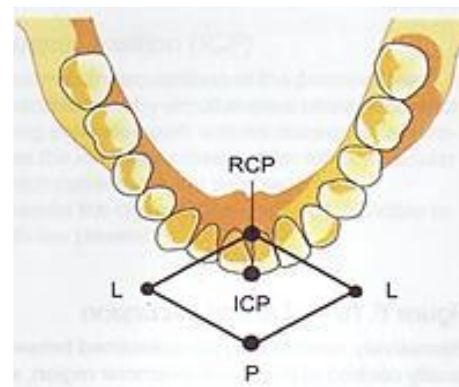
### Centric occlusion

It is the occlusion of opposing teeth when the mandible is in centric relation.



### Maximal intercuspation position

The most complete interdigitating of the teeth independent of condylar position. Hence maximal intercuspation is a maxilla-mandibular relationship determined by *tooth-to-tooth relationship*.



### Importance of centric relation

- 1- It is a reference position.
- 2- It is a learnable, repeatable, and recordable position.
- 3- It is the starting point for developing occlusion.
- 4- Functional movements like chewing and swallowing are performed in this position.
- 5- It is a reliable jaw relation because it is bone to bone relation.

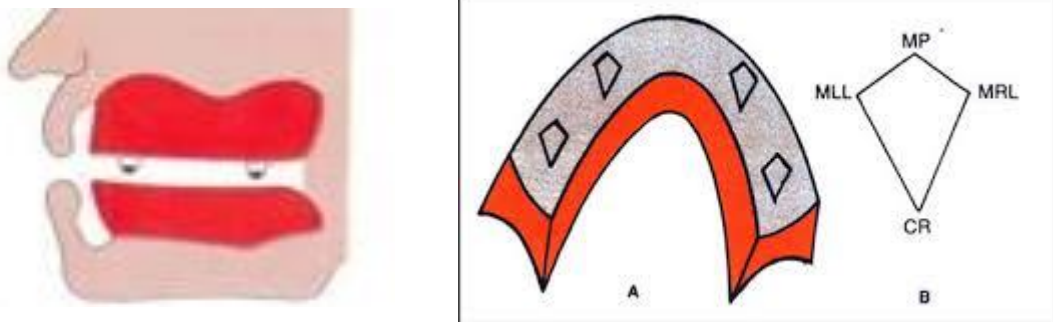
## Methods of recording centric relation

- 1- Functional (chew-in) methods.
- 2- Graphic method.
- 3- Tactile or inter occlusal check record method.

### 1- Functional methods

#### A- Needles-House technique

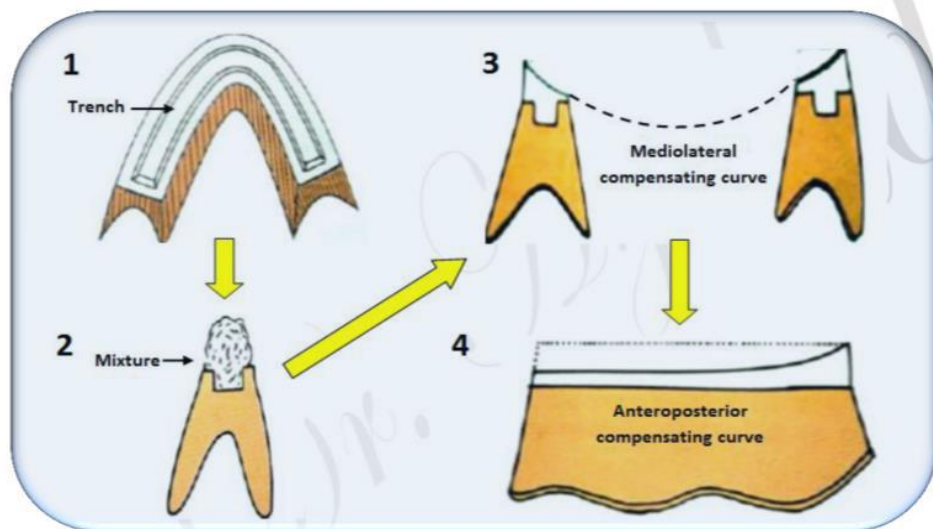
This method used impression compound occlusion rims with four metal styli placed in the maxillary rim. When the patient moves his mandible, the styli on the maxillary rim will create a marking on the mandibular rim, after all mandibular movements are made, a diamond-shaped pattern is formed. The anterior-most point of this diamond pattern indicates the centric jaw relation.



**MP: maximum protrusion, MLL: maximum left lateral, MRL: maximum right lateral, CR: centric relation.**

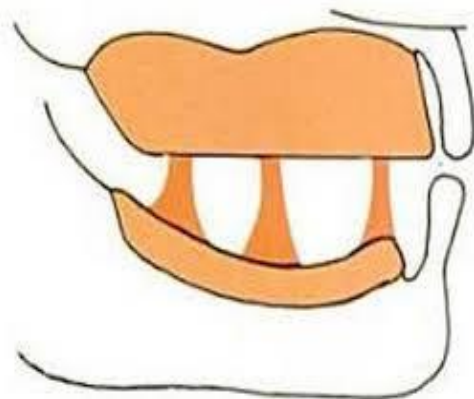
#### B- Patterson technique

This method used wax occlusion rims. A trench is made along the length of the mandibular rim. A 1:1 mixture of pumice and dental plaster is loaded into the trench. When the patient moves his mandible, mediolateral and anteroposterior compensating curves will be produced on the mixture, and the height of the mixture is also reduced. The patient is asked to continue these movements till a predetermined vertical dimension is obtained. Finally, the patient is asked to retrude his jaw and the occlusal rims are fixed in this position with metal staples.



### C- Swallowing technique

In this method, soft cones of wax are placed on the lower record base. The wax cones contact the upper occlusion rim when the patient swallows.



Note: the disadvantages of functional methods involve lateral and anteroposterior displacement of the recording bases in relation to the supporting bone while the record is being made.

### 2-Graphic methods

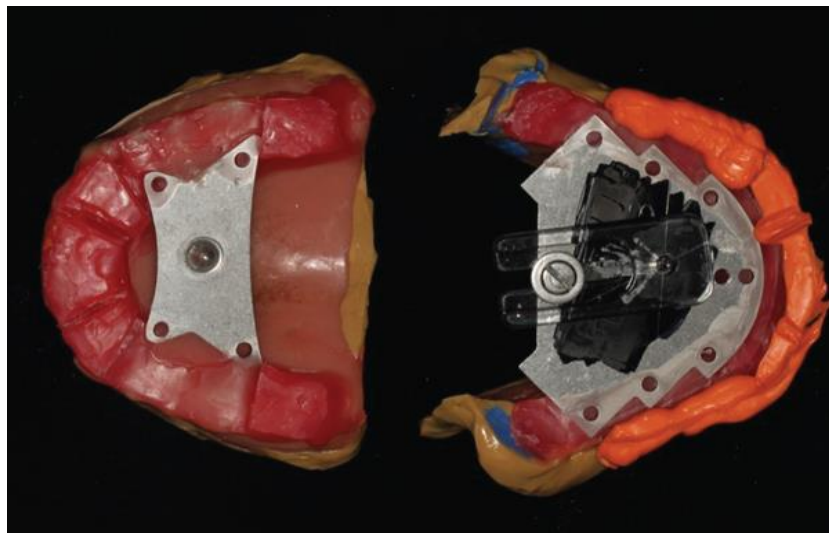
These methods are called so because they use graphs or tracing to record the centric relation.

The general concept of this technique is that a pen-like pointer is attached to one occlusal rim and a recording plate is placed on the other rim, the plate coated with carbon or wax on which the needle point can make the tracing when the mandible

moves in horizontal plane, the pointer draws characteristic patterns on the recording plate.

The characteristic pattern created on the recording plate is called arrow point tracing, also known as Gothic arch tracing. The apex of the arrow point tracing gives the centric relation, with the two sides of the tracing originating at that point being the limits of the lateral movements. The apex of the arrowhead should be sharp else the tracing is incorrect.

The graphic methods are either intra-oral or extra-oral depending upon the placement of the recording device. The extra-oral is preferable to the intra-oral tracing because the extra-oral is more accurate, more visible, and larger in comparison with the intra-oral tracing.



### **3- Tactile or inter occlusal check record method**

In this method, the centric relation is recorded by placing a recording medium (wax, plaster, zinc oxide eugenol, silicon, and polyether) between the record bases when the jaws are positioned at centric relation.

The patient closes into the recording medium with the lower jaw in its most retruded unstrained position and stops the closure at a predetermined vertical dimension.

This method is simple because mechanical devices are not used in the patient's mouth and are not attached to the occlusion rims. This method has the advantage of causing minimal displacement of the recording bases in relation to the supporting bone.

This method is essential in making an accurate record, the visual acuity and the sense of touch of the dentist also inter in making of centric relation record, this phase is developed with experience and it is difficult to teach to another individual.

#### **Indication of inter occlusal check record method:**

- 1- Abnormally related jaws.
- 2- Displaceable, flabby tissue.
- 3- Large tongue.
- 4- Uncontrollable mandibular movements.
- 5- It can also be done for patients already using a complete denture.

#### **Methods for assisting the patient to retrud the mandible**

1. Instruct the patient by saying “Let your jaw relax, pull it back, and close slowly and easily on your back teeth”
2. Instruct the patient to contact with his tongue a piece of wax placed on the posterior palatal seal area and slowly close.
3. The patient is asked to bring his upper jaw forward while occluding on the posterior teeth.

4. The head is tilted backward which makes protrusion more difficult
5. The patient is asked to swallow and close slowly.
6. Instruct the patient to do routine jaw exercises.

### **Factors that complicate centric relation record**

- 1- Resiliency of the tissues supporting the denture base.
- 2- Stability and retention of the record bases.
- 3- The TMJ and its neuromuscular mechanism.
- 4- Amount of pressure applied in making the record.
- 5- Technique employed in making the record.
- 6- The ability of the dentist.

### **Methods of recording eccentric jaw relations**

The main reason for making an eccentric jaw relation is to adjust the articulator to simulate the eccentric movement of the mandible to the maxilla and establish balanced occlusion.

The methods are similar to those made for centric relations and include functional, graphic, and inter-occlusal records.

### **Inter occlusal eccentric records**

(Protrusive, left and right lateral movement), can be made on the occlusion rim or on the posterior teeth at the try-in appointment.