Horizontal Jaw Relation

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

❖ **The Horizontal Relations include:**

1. Centric jaw relation

2. Eccentric jaw relations

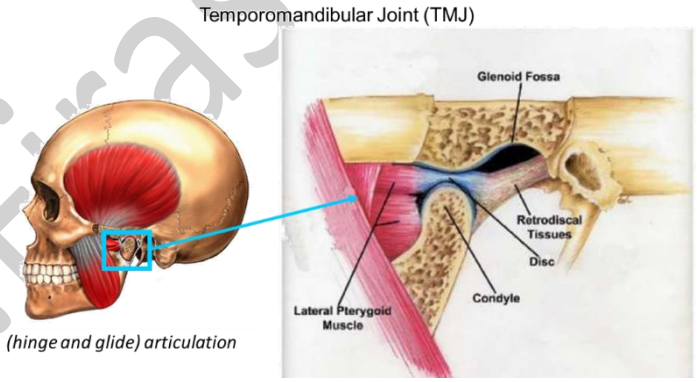
A. Protrusive or forward relation
B. Left or right lateral relation

1. Centric jaw relation:

It is the Maxillo-mandibular relationship in which, both condyles head articulate with the thinnest avascular portion of their respective disks with its complex in the anterior-superior position against the shapes of the articular eminencies.

This position is independent on teeth contact and can be noticeable clinically when the mandible directed superiorly and posteriorly, 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.

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



❖ **Centric occlusion:**

It is the contact between the occlusal surface of the maxillary teeth with the opposing mandibular teeth when the mandible in centric relation.

❖ **Maximal Intercuspal Position:**

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

Importance of Centric Jaw Relation

1. It is a reference position from which the mandible can move to any direction
2. It is a learnable, repeatable and recordable position.
3. It is the start point for developing occlusion.
4. Functional movement like chewing and swallowing are performed in this position.
5. It is a reliable jaw relation because it is bone-to-bone relation.

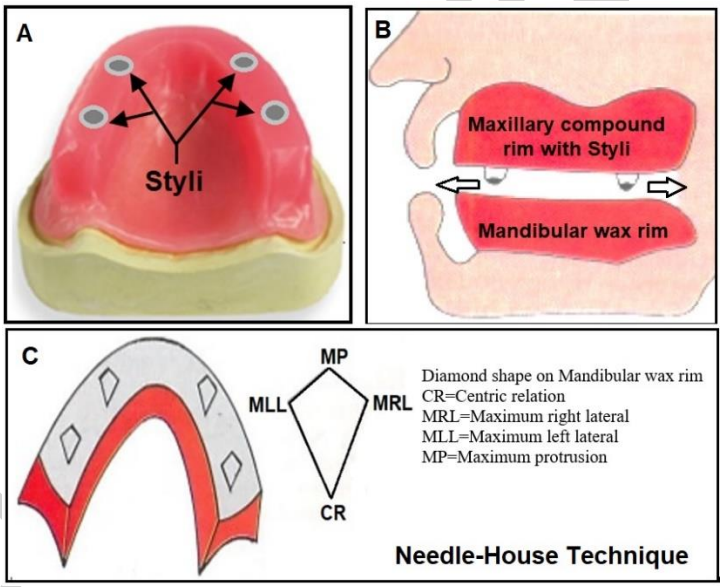
Methods of Recording Centric Jaw Relation

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

1- Functional methods:

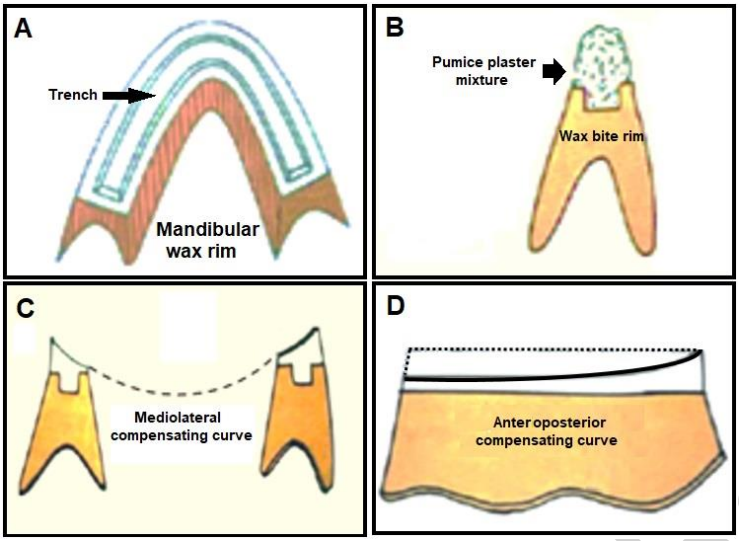
A- Needles-House Technique

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 movements of mandibular completely; a diamond-shaped pattern is formed. The anterior most point of this diamond pattern indicates the centric jaw relation.



B- Patterson Technique

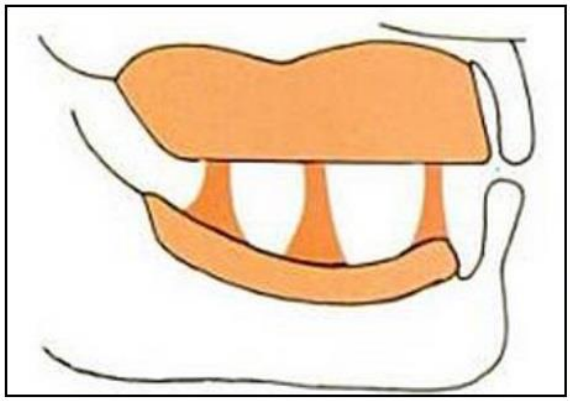
In this method, a trench made along the length of occluding part of the mandibular wax rim. A mixture of pumice and dental plaster with ratio 1:1 is loaded into the trench. When the patient moves his mandible, compensating curves on the mixture was formed due to decreases height of the mixture. The patient asked to continue with these movements until a predetermined vertical dimension obtained. Finally, the patient asked to retruded his jaw and the occlusal rims fixed with metal staples.



The disadvantages of functional methods involve lateral and anteroposterior displacement of the record bases in relation to the supporting bone while the centric record being made.

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. This method is also used to record occlusion vertical dimension.

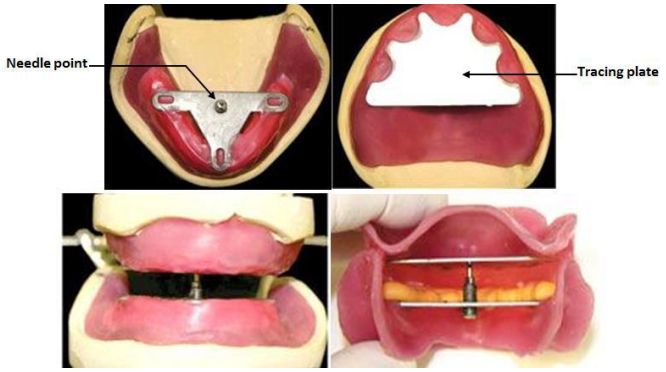


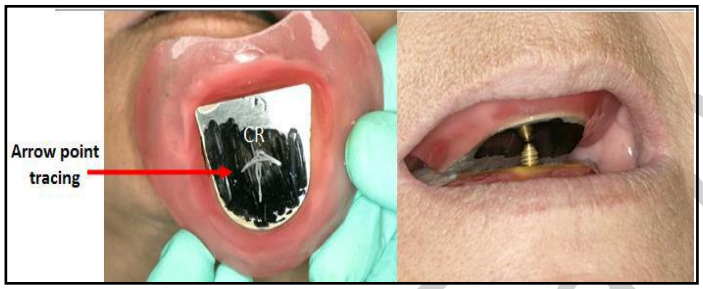
2- Graphic methods

These methods used graphs or tracing (drawing) to record the centric relation. The general concept of this technique is that a pen-like pointer 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 patterns 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 comparing with the intra-oral tracing.





Intra-oral graphic method

Extra-oral graphic method

3- Tactile or interocclusal check record method

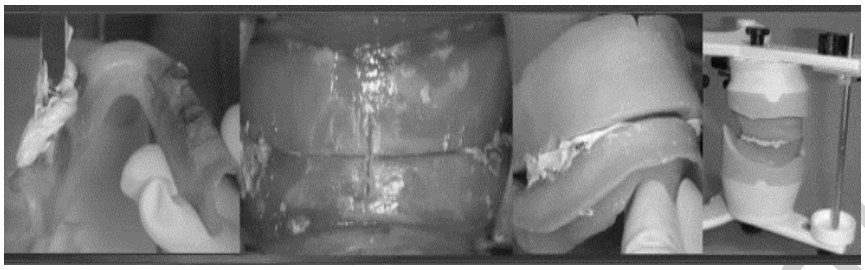
According to this method, the centric relation recorded by placing a recording medium between the maxilla and mandible record bases when the jaws positioned at centric relation.

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

This method is simple because mechanical devices are not used in the patient 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 insight, the sense of touch by the dentist in the making of centric relation record, this phase developed with experience, and it is difficult to teach to another individual.
Materials that are commonly used for **interocclusal check record** include wax, plaster, zinc oxide eugenol, silicon and polyether.



An indication of interocclusal check record method:
1. Abnormally related jaws.
2. Displaceable, flabby tissue.
3. Large tongue.
4. Uncontrollable mandibular movements.
5. It used for patients already wearing a complete denture.

❖ **Methods used for assisting patient to retruded the mandible:**
1. Instruct the patient to let his jaw relax, pull it back, and close slowly on his 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 asked to bring his upper jaw forward while occluding on the posterior teeth.
4. The head tilted backward, which makes protrusion more difficult
5. The patient 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.

2. <u>Eccentric jaw relations:</u>
Any relationship between the jaws other than centric relation.

Lateral jaw relation: The relation of the mandible to the maxillae when the lower jaw is in a position to either side of centric relation.
Protrusive jaw relation: The relation of the mandible to the maxillae when the mandible thrust forward.

❖ **Methods of Recording Eccentric Jaw Relations:**
The main reason in 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 that used for centric (the functional, graphic and interocclusal records).

Interocclusal 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 by Hanau articulator.

Hanau articulator used to register eccentric record according to the following formula to obtain lateral inclination:

L=H/8+12

L= lateral condylar inclination.
H= horizontal condylar inclination as established by the protrusive record.

Factors considered during making eccentric jaw relation

1. The condylar path of the patient cannot be altered.
2. The condyles do not travel in straight lines during eccentric mandibular jaw movements.
3. Semi-adjustable articulators in which the condyles travel on a flat path cannot be used to reproduced eccentric movements exactly.
4. Fully-adjustable articulators, where the condylar and incisal guidance is fabricated individually with acrylic, can travel in the path of the condyle using pantographic tracings.