Jaw Relations and Mandibular Positions

Jaw Relations:
- Centric Relation and Centric Occlusion.
- Protrusive Relation.
- Right and Left lateral relation.

Mandibular Positions:
- Physiological rest position.
- Vertical dimension of occlusion.
Jaw Relations

- **Jaw Relation**: It refers to the position of the mandible relative to the position of the maxilla.

Centric Relation

Definitions:

- The most retruded physiologic relation of the mandible to the maxillae to and from which the individual can make lateral movements.

- It is the maxillomandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective discs with the complex in the anterior-superior position against the slopes of the articular eminences.
Centric Relation

- It is a horizontal anteroposterior bone to bone relation (independent of tooth contact).

Centric Occlusion

**Definition:**
The occlusion of the opposing teeth when the mandible is in centric relation.

*Centric occlusion is a tooth contact-determined position, not a condylar-determined position.*

**Maximal Intercuspal Position:**
The complete inter-cuspation of the opposing teeth independent of condylar position.
Centric Relation

The centric relation is important in the construction of complete dentures for the following reasons:

• It is a definitive position.
• The patient can voluntarily and reflexly return to this position.
• It can be recorded and repeated.
• It is a reference point in recording other relations or positions of the mandible.
• It is a starting point for developing occlusion.
• The mandibular casts are mounted on an articulator in centric relation.

Eccentric Relationship:

Eccentric relations or positions of the mandible:
Any relation of the mandible to the maxilla other than centric relation is called an Eccentric Relation.

The eccentric relation or position of the mandible consists of:
Protrusive relation.
Right-lateral relation.
Left lateral relation.
Protrusive Relation:

Protrusion is defined as a position of the mandible anterior to centric relation.

“It is relation of the mandible to the maxilla when the mandible is thrust forward”.

The movement of the condyles in the joint is downward and forward. The condyles and the discs are guided downward against the articular eminences of the glenoid fossae.

Protrusive Relation:

The angle of the slide varies from patient to patient and from side to side in the same patient and is called “Condyles Guidance”.

By the definition a condylar guidance is the mandibular guidance generated by the condyles traversing the contours of the glenoid fossae.

Guidance means providing direction to movement; a guide.
Lateral MaxilloMandibular Relation:

The lateral mandibular relation is defined as the relationship of the mandible to the maxillae in a position to the left or right of the mid-sagittal plane.

Right and Left MaxilloMandibular Relation:

**Working side:** The side towards which the mandible moves in lateral excursion. The condyle on that side is referred to as the working side condyle.

**Non-working side:** It is the side of mandible that moves toward the median line in lateral excursion. The condyle on that side is referred to as the non-working side condyle.
Right and Left MaxilloMandibular Relation:

*Bennett Angle:* The angle formed between the sagittal plane and the average path of the advancing condyle as viewed in the horizontal plane during lateral mandibular movement.
Type of Movements:

• Rotational Movement

• Translational Movement

• Lateral Movement

Rotational Movement

Around the horizontal axis (hinge axis)
Factors related to centric relation are:

(Cont's)

- The condyles are seated in superior anterior position against the slopes of the articular eminences, and the mandible can rotate around a fixed transverse horizontal axis also called the terminal hinge axis.

- As the condyles rotate around the terminal hinge axis the lower incisor midpoint arcs about 20 to 25 mm. This movement is termed the terminal arc of closure.

Rotational Movement

- If the mandible opens beyond the terminal arc of closure i.e.; 25 mm the condyles move forward and downward.
• Translator movements of the condyle
  ─ Forward or protrusive movement
  ─ Translator movement that occurs when the mouth is opened wide
**Physiologic Rest Position:**

Definition:

The position assumed by the mandible when the head is in an upright position, the muscles are in equilibrium in tonic contraction and condyles are in a neutral, unstrained position.
**Vertical Dimension:**

- **Vertical dimension** is defined as the distance between two selected points, one on the fixed (maxilla) and one on a movable member (mandible).

- When the mandible is in the physiologic rest position the masticatory muscles are in a state of minimum activity. The length of the face measured from the tip of the nose and tip of the chin is termed “rest vertical dimension.”

**Vertical Dimension:**

At the rest position the maxillary and mandibular occlusal surfaces of teeth are separated. This separation is termed **interocclusal distance or “free way space.”**

The interocclusal distance has an average range of 2 to 4 millimeters.
Vertical Dimension:

Significance of physiologic rest position:

In the construction of complete dentures the physiologic rest position is important – because:

- It is a bone to bone relation in vertical direction.
- It is a constant position throughout life.
- It is not affected by the loss of natural teeth.
- The position can be recorded and measured within acceptable limits and
- It is used in the determination of *vertical occlusal dimension*.

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Vertical Dimension:

**Occlusal vertical dimension:**

It is defined as *the distance measured between two points when the occluding members are in contact.*

*Rest Vertical Dimension = Occlusal Vertical Dimension + Interocclusal Rest Space (Freeway space)*
**Ridge Relationship:**

The positional relationship of the mandibular residual ridge to the maxillary residual ridge.

**Ridge relationship is classified into:**

*Class 1: Normal*

*Class 2: Retrognathic*

*Class 3: Prognathic*

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**Class 1: Normal**

The upper ridge crest is directly above the lower ridge crest, arrangement of teeth will be conventional.
Ridge Relationship:

Class 2: Retrognathic

The lower jaw is smaller than the upper jaw. Arrangement of teeth requires that the vertical overlap (overbite) and horizontal overlap (overjet) of anterior teeth be increased with reduction or elimination of lower first pre-molar.

Class 3: Prognathic

The lower jaw is larger than the upper jaw and lies outside of the crest of the upper ridge. Arrangement of teeth will be cross bite.
Recording the Maxillomandibular Relationship:

Sequence of the Clinical Procedures:

1. Check extension, retention and stability of upper and lower record bases.
2. Determine the posterior palatal seal.

![Image of maxillary and mandibular record bases.]

Recording the Maxillomandibular Relationship:

Sequence of the Clinical Procedures: (Cont’s)

3. Shape the upper record (occlusion) rim to provide a guide to the arrangement of the artificial teeth.

   A. Restoration of the Labial Contour (Labial Fullness)
   observed from the front and profile views

   B. Adjust the level of the Occlusal Plane
   The average adult shows approximately 1-2 mm of the upper central incisors when the lips are just parted.
Recording the Maxillomandibular Relationship:

C. **Anterior Plane:**
is parallel to an imaginary line joining the pupils of the eyes or a line at right angles to the median sagittal plane of the face.

D. **Anteroposterior Plane:**
parallel to the ala-tragus line (an imaginary line running from the inferior border of the ala of the nose to some defined point on the tragus of the ear.

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Recording the Maxillomandibular Relationship:

**Sequence of the Clinical Procedures:**
*(Cont’s)*

4. Register the vertical component of jaw relationship (occlusal vertical dimension).
Recording the Maxillomandibular Relationship:

Sequence of the Clinical Procedures: (Cont’s)

5. Obtain a face-bow record.

Recording the Maxillomandibular Relationship:

Sequence of the Clinical Procedures: (Cont’s)

6. Register the horizontal component of jaw relationship (centric realtion).
Recording the Maxillomandibular Relationship:

Sequence of the Clinical Procedures:

(Cont's)

8. Prepare a written laboratory work authorization.
Questions