

Second Stage

## 8. lecture



# Maxillo-Mandibular Relation

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## Maxillo-Mandibular Relationship Record:

It is a registration of any positional relationship of the mandible relative to the maxilla .These records may be at any **vertical**, **horizontal**, or **lateral** orientation.

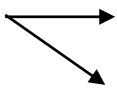
### Types of jaw relation:-

#### A- Vertical relation

- 1- Vertical relation of occlusion.
- 2- Vertical relation of rest position.

#### B- Horizontal relation:

1- Centric jaw relation

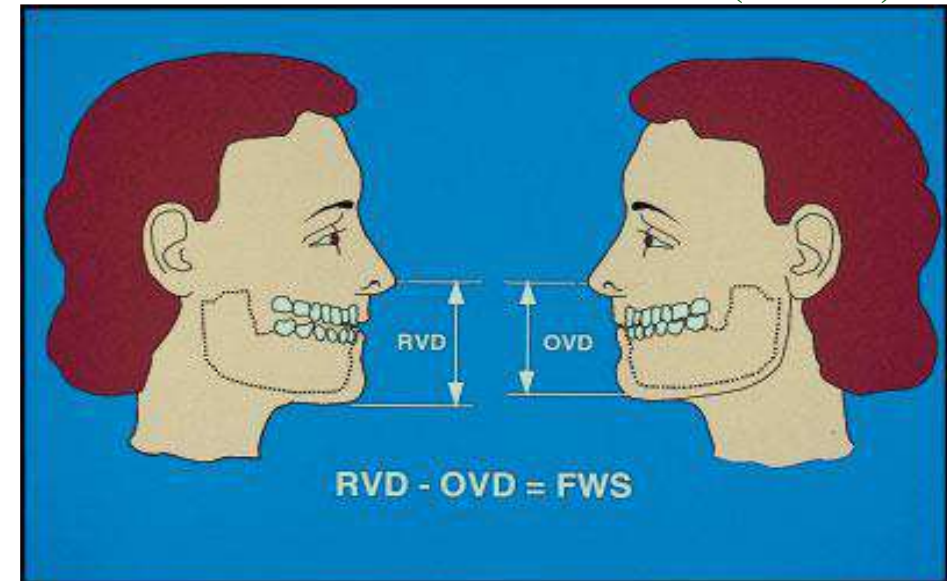
2- Eccentric jaw relation  Lateral jaw relation  
Protrusive relation

## Vertical jaw relation

- **Rest Vertical Dimension:** The distance between two selected points, one on a **fixed** and one on a **movable** member. In general, vertical measurements of face could be recorded between any **two arbitrary** selected points which are usually located one above the mouth at the tip of nose and the other below the mouth at the tip of chin in the midline region.
- **Occlusal Vertical Dimension:** The distance measured between two points when the occluding members are in contact. (Occluding teeth or occlusal rims are in contact).
- **Inter occlusal distance (freeway space):** The distance between the occluding surface of the maxillary and mandibular teeth, when the mandible is in its physiological rest position.



**RVD - OVD = Inter occlusal distance (2-4 mm)**



- **Vertical dimension of speech:** The distance measured when the occluding members are in their closest proximity during speech.

## **Importance of vertical dimension**

1- Functional roles include:

a- Mastication

b- Respiration

c- Deglutition

d- Phonetics

2- Psychological role.

3- Esthetic role.

4- Comfortable role by maintenance health of tissue, mucosa, bone, muscles and T.M.J (temporo-mandibular joint).

# Consequences of Incorrect Vertical Dimension

## A- Increased vertical dimension

- 1- Interference with speech.
- 2- Sensation of bulk (bulky denture).
- 3- Premature contact of upper and lower teeth.
- 4- Instability of dentures due to their excessive height
- 5- Accelerated resorption of residual alveolar ridge.
- 6- Loss of biting power.
- 7- Clicking of teeth in speech and mastication.
- 8- Muscular fatigue.
- 9- Separated upper and lower lip with poor esthetics.
- 10- Apparent inability to open mouth widely.
- 11- Inharmonious facial proportion.
- 12- Excessive display of artificial teeth and gum.

## **B- Decreased vertical dimension.**

- 1- Presence of wrinkles and folds not due to age.
- 2- Loss of biting power.
- 3- Muscular fatigue.
- 4- Neuralgia or other features.
- 5- Pain in the region of TMJ.
- 6- Cheek biting.
- 7- Thin lipped appearance.
- 8- Decreased lower facial height with prominence of lower jaw and chin.
- 9- Angular cheilitis due to folding of the corner of the mouth.



## Methods of recording vertical relation

### A- Methods of recording rest vertical dimension:

1- **Facial measurements:** Instruct the patient to **sit upright** and **relax**, then ask the patient to **wipe** his lips with his tongue, to **swallow** and to **drop** his shoulders. When the mandible drops to rest position measure between the points of reference (nose and chin).

**2- Tactile sensation:** Instruct the patient to stand **erect** and open the jaws wide until strain is felt in the muscles. When this opening becomes uncomfortable, ask him to close slowly until the jaws reach a comfortable relaxed position. Measure the distance between the reference points and compare with the measurements made after swallowing.

**3-Phonetics:** The patient is asked to repeatedly pronounce the letter “**m**” a certain number of times. When the lips touch, ask him to stop all jaw movement. At this time measure between the two reference points.

**4- Facial expression:** The experienced dentist may notice the relaxed facial expression when the patient’s jaws are at rest. In normally related jaws the upper and lower lips should have a slight contact in a single plane. Also the skin around the eyes and chin should be relaxed. It should not be **stretched**, **shiny** or **excessively wrinkled**.



**5- Anatomical landmarks:** The **Willis guide** is designed to measure the distance from the pupils of the eye to the corner of the mouth and the distance from anterior nasal spine to the lower border of the mandible, if both these distances are **equal**, the jaws are considered at rest.

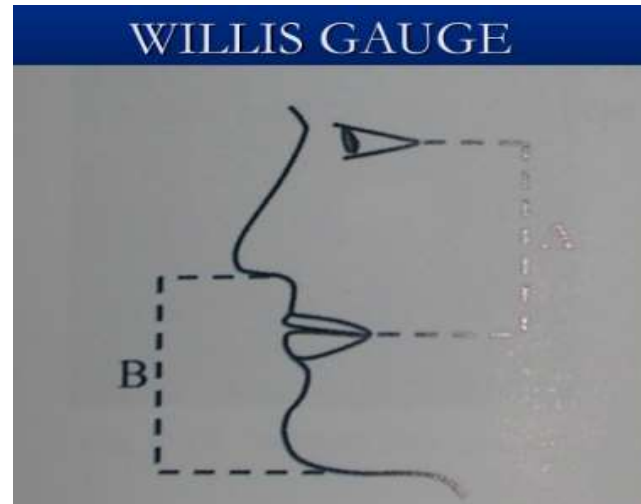
**6- Electra - myographic method:** It is a special device that measures **the tone of the masticatory muscles**, when the tone is at its least, this means these muscles are in rest position and the jaws are at rest position.



Facial tracking for char...



Electromyography - Wikipedia



## B- Methods of Recording Occlusal Vertical Dimension:

### 1. Pre-extraction records:

#### a- Profile photographs:



#### b- Profile silhouettes:



#### c- Radiographs:



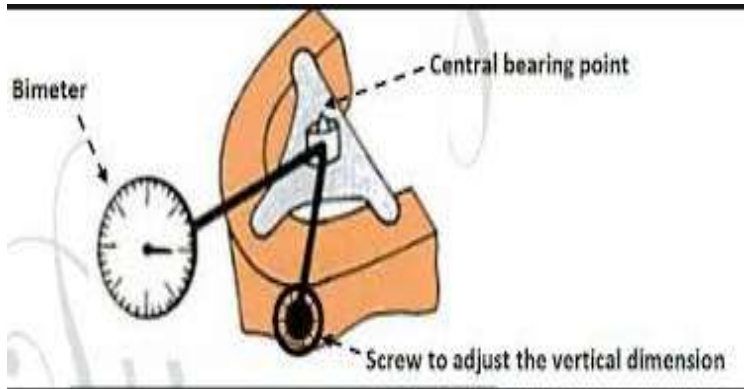
#### d- Articulated casts:

**e- Facial measurements:** *Two tattoos are marked on the upper and lower halves of the face before extraction*

#### f- Measurements of former dentures:

## 2. Methods without pre-extraction records:

**a- Power point (by Boos):** A metal plate is attached to the maxillary record base. A Bimeter is attached to the mandibular record base.



- The Bimeter is attached to an accurately adapted mandibular record base.
- A metal plate is attached to the vault of an accurately adapted maxillary record base to provide a central bearing point.



**b- Neuromuscular perception:** A central bearing device attached to accurately adapted record bases permits the patient to experience through neuromuscular perception the different vertical relations. The central bearing screw is adjusted downward and upward until the height of the contact feels right to the patient and this represents the occlusal vertical dimension.

**Lytle method (1964)**

- Central bearing device attached to record bases
- Central bearing screws - palate of max. denture base/occlusal rim
- Central bearing plate- mand.
- Patient participation - very important.
- Disadvantages:**
  - Can't be used in very sensible patients & **impaired neuromuscular patients.**
  - Patients tended to register a reduced vertical dimension.
  - Relied on pt' muscular perception.



**c- Swallowing threshold:** The theory behind this method is that when a person swallows, the teeth come in contact together with a very light contact at the beginning of swallowing cycle.

**d- Phonetics:** Phonetics methods are widely used to evaluate the proper vertical dimension of occlusion. During pronunciation of sounds like **ch**, **s**, **j**, the upper and lower teeth reach their closest relation without contact.