

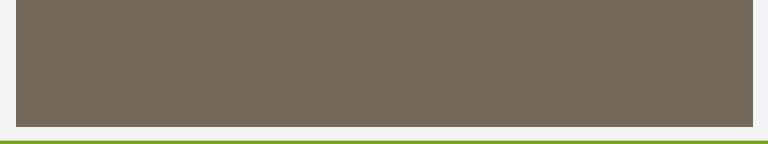
# ***Occlusion***

***Dr. Inas Abdul Sattar***

**Occlusion:** is the relationship between the occlusal surfaces of the maxillary and the mandibular teeth when they are in contact .

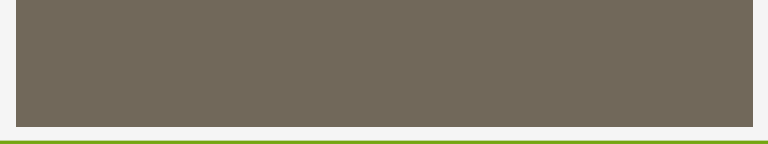
There are several theories of occlusion but all of them share in achievement of masticatory efficiency, maximum stability & preservation of the underlying oral tissue.





**Centric occlusion:** is the relation of opposing occlusal surfaces of the teeth that provides the maximum intercuspation (tooth to tooth relation) .

**Eccentric occlusion:** is the contacting of opposing occluding surfaces of the teeth when the jaws are in any other relation than centric relation.



**Balanced occlusion:** is described as the occlusal contacts of maxillary & mandibular teeth when the jaws are in either centric or eccentric relation.

**Working or function occlusion side:** in which buccal cusps of upper teeth meet buccal cusps of lower teeth & palatal cusps of upper teeth meet lingual cusps of lower teeth in lateral movement during mastication.

*Working side*



**Balancing occlusion side :** in this side, palatal cusp of upper teeth contact buccal cusps of lower teeth , such a contact during function help to maintain the denture in position during lateral movements. As example, during left lateral movement, the left side of the dental arch becomes the working side and the right side becomes the balancing side.



**Protrusive balancing occlusion:** contacts in protrusive movements permit the posterior teeth touch when the anterior teeth are in contact. This helps maintain denture stability. The distal inclines of the maxillary facial cusps contact the mesial inclines of the lower facial cusps. Protrusive balancing contacts may also occur on the lingual cusps.



*Balancing*



*Working*



*Protrusive*





# Concepts of occlusion for complete denture

We should consider the concept of occlusion which we are going to adapt it during the arrangement of teeth.

## 1- Neutro- centric or monoplane occlusion or flat plane concept

using simple articulator & non-cusp form posterior teeth arranged in a flat plane without any curvature like the compensating curve and the occlusal plane is parallel to the residual ridges.

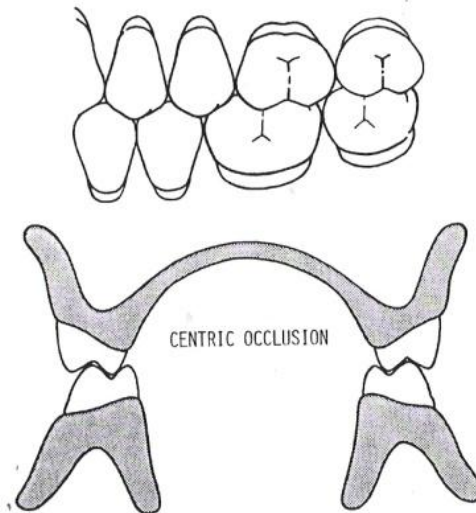


**\*Advantages:** It provides freedom in centric occlusion & more stability of the dentures, it is used in class II & III occlusion.

**\*Disadvantages:** the decreased chewing efficiency because of the absence of the cusps, decreased esthetic in premolar area because of the missing cusp & in anterior teeth region since they are set in edge to edge relation with out overbite or overjet.

**2- Balanced occlusion concept:** this is the ideal occlusion for complete denture , it can be defined as an occlusion which gives a harmonious and simultaneous contact between the teeth in centric and eccentric relation & in all mandibular movement to achieve stability of the denture within the functional limit.

In our school we use this concept. It needs the use of cusp form posterior teeth (anatomic or semi anatomic teeth) & adjustable articulator.



### **3- Lingualized occlusion concept:**

This can combine components of both of the previous occlusal schemes like using of cusp form upper teeth & non-cusp form lower posterior teeth to get the advantages of both types of teeth & concepts .

The upper posterior teeth are set with buccal inclination so that the buccal cusp is out of occlusion in centric & lateral movements while their lingual cusps make in contact with the middle of the lower wide shallow fossa of non cusp form lower teeth .

**\*Advantages:** freedom in centric relation, better stability because less cusps are involved in lateral & protrusive movements, better chewing efficiency because of the sharp upper lingual cusps.



## Indication of each type of the previous concepts:

**1. age of the patient:** old age & geriatric patients need monoplane or lingualized concept because of their poor muscle tonicity while we can use balanced occlusion in young patients.

**2. condition of oral health:** patient with resorbed ridges or bad soft tissue condition like flabby ridge need monoplane or lingualized concept & we can use balanced concept in adverse conditions.

**3. demand of the patient:** esthetic & function demand need balanced or lingualized occlusion.

**4. skill of the dentist & the technician:** balanced occlusion need an experienced dentist & technician in using of the adjustable articulator & teeth setting.

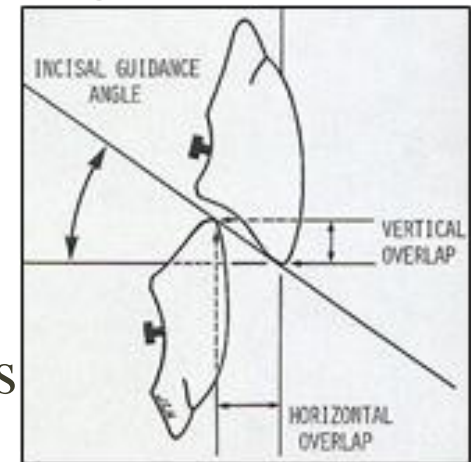
**Factors of occlusion:** There are five factors of occlusion which influence the arrangement of posterior teeth or governing articulation, these factors are:-

**1- Condylar guidance :** is the part of an articulator that intended to produce similar guidances in articulator movement as that produced by the paths of the condyles in the temporomandibular joints. The condylar guidance inclination is the only factor totally controlled by the patient and the dentist can't change or modify it to fit a particular occlusion unlike the other factors which is entirely under the control of the dentist.



**2- Incisal guidance :** is the part of an articulator that maintains the incisal guide angle. The last is the angle formed with the horizontal plane by drawing a line in the sagittal plane between the incisal edges of the maxillary and mandibular central incisors when the teeth are in centric occlusion.

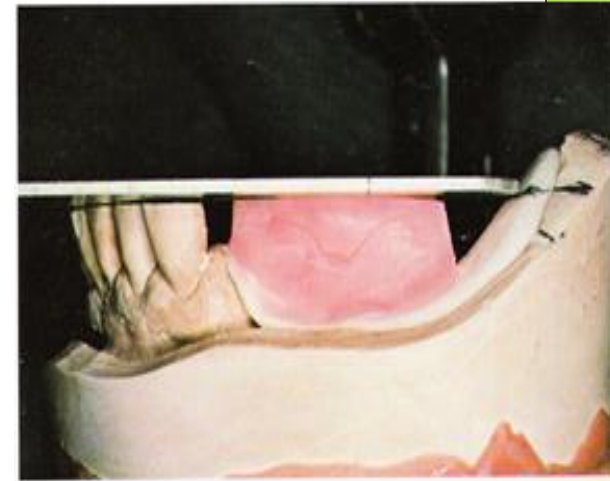
For the patient, the incisal guide is influenced by the amount of horizontal & vertical overlaps of anterior upper & lower teeth developed during teeth arrangement . the greater the horizontal overlap and the less the vertical overlap result in a less incisal guide angle and a more stable dentures because of the reduction of lateral inclines



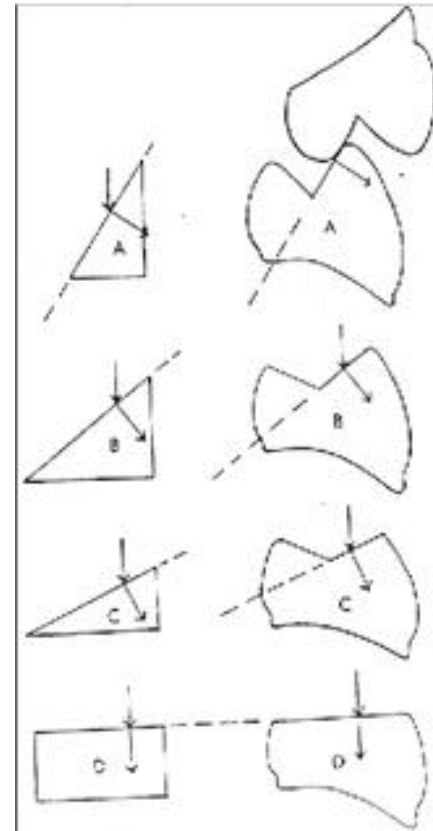


**3- Occlusal plane:** is an imaginary surface that is related anatomically to the cranium and that theoretically touches the incisal edges of the incisors and the tips of the occluding surfaces of posterior teeth.

**The soft tissue guides** used by the dentist in locating the plane are the retromolar pads (junction of middle and upper third of each pad) and the corners of the mouth bilaterally. The orientation of the plane is selected to be in harmony with the lateral borders of the patient's tongue & medial roll of buccinator muscle so that food can be held between the teeth for proper chewing

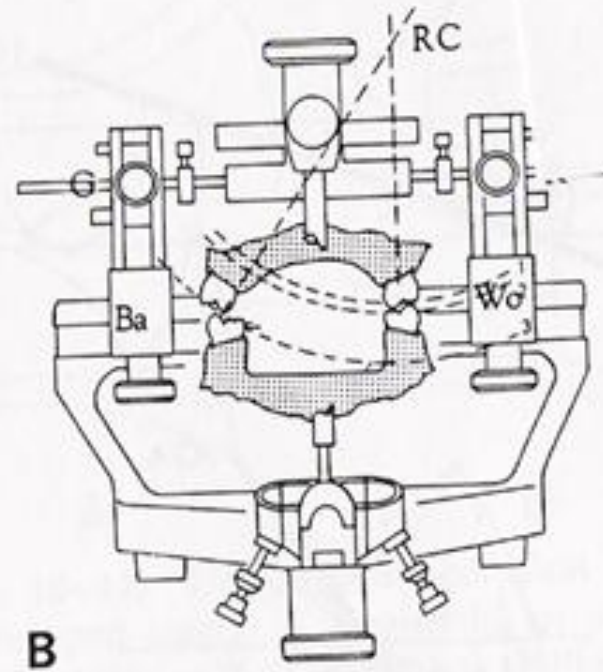
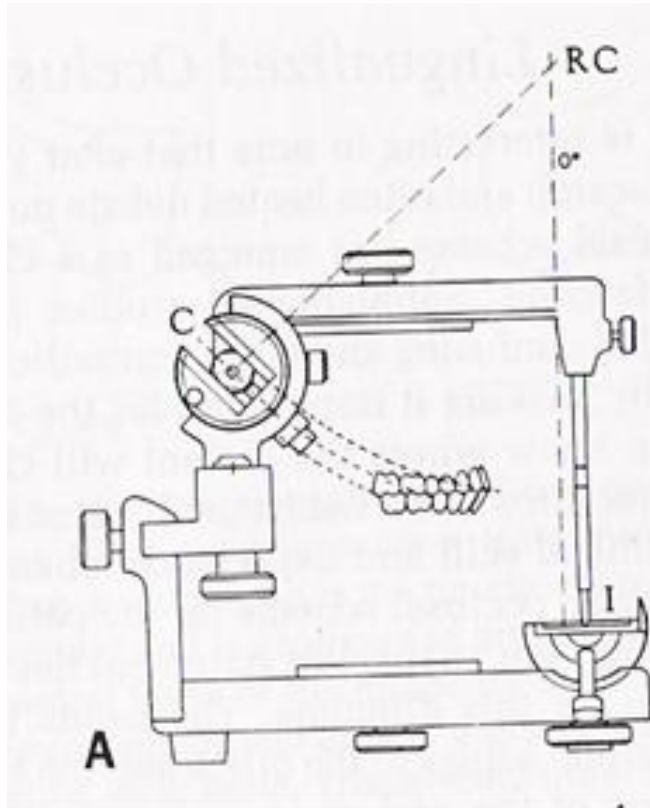


**4- Cusp height** : is defined as the shortest distance between the deepest part of the central fossa of a posterior tooth and a line connecting the tips of the cusps of the tooth. Cusp inclines disturb the stability of dentures & should be reduced to a minimum to eliminate lateral forces on teeth & denture.



**5- Compensating curve & Manson's curve:** is the antero-posterior curvature of the occlusal surface of a complete denture teeth; it provides for a balanced occlusion. It corresponds to the curve of spee which is an anatomical curve in the sagittal plane present in the natural dentition. The compensatory curve may be increased or decreased in an artificial dentition to help achieve balanced occlusion.

Another curve in the frontal plane in the natural dentition which we call it Manson's curve or Willson's curve which is passed between upper molar cusps of right & left side of the upper arch.





# **THE TRY -IN APPOINTMENT**

It is the fourth clinical step or appointment in complete denture construction. After the primary arrangement of the teeth on the bite rims, it is essential that the accuracy of the jaws relation records made with the bite rims be tested for the following:

- Check vertical dimension of occlusion and rest
- Prove centric relation record
- Evaluate esthetics and phonetics
- Posterior palatal seal
- Teeth position

**1. Vertical dimension:** Vertical dimension of rest(V.D.R) is measured first with out trial dentures in patient mouth between a prominent points in patient chin & nose by a gauge or roller.

Then Vertical dimension of occlusion(V.D.O) is measured , maxillary & mandibular trial dentures are placed in the mouth, the mandible is guided to close into centric relation by the dentist's thumb placed directly on the anteroinferior portion of the patient's chin and the index fingers bilaterally on the buccal flanges of the lower trial denture while the patient pulls his lower jaw back as far as it will go and closes just until the back teeth make a feather touch with each other.



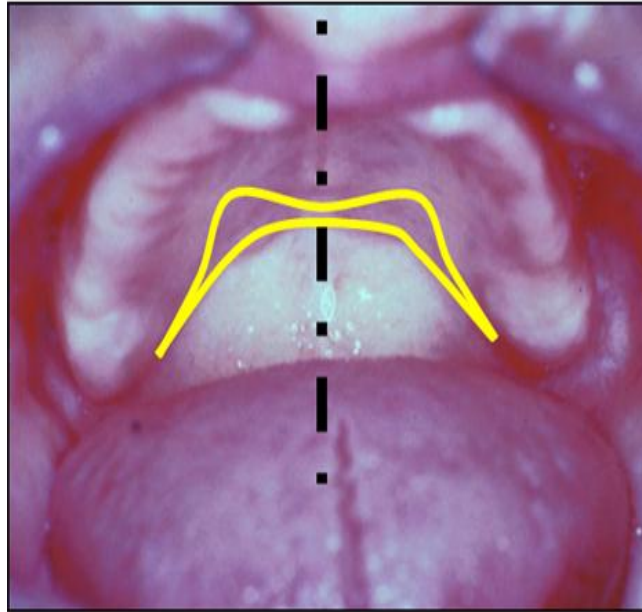
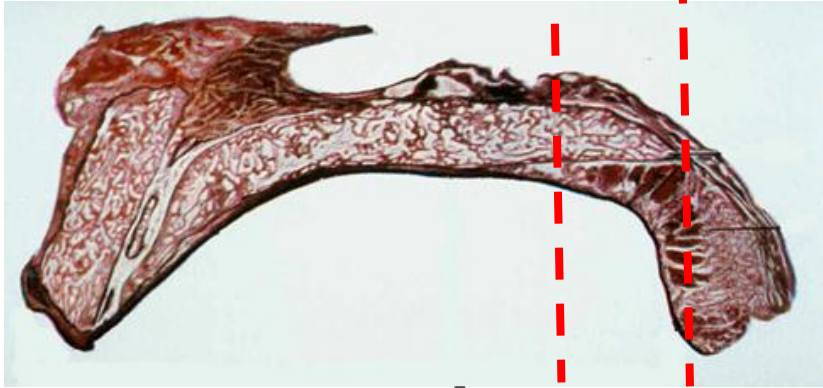
V.D.O must be less than V.D.R by 2-4mm(free way space), if the difference is less than 2mm, this mean there is increased V.D.O but if the difference is more than 4mm this mean there is decreased V.D.O so it must be corrected .



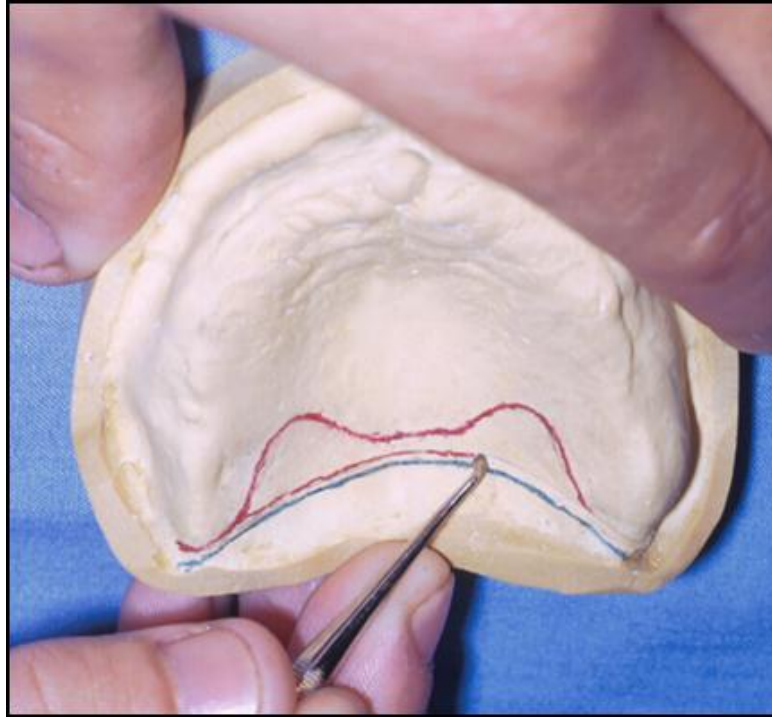
**2. Centric jaws relation(CR)** : test for accuracy of CR record involves the observation of intercuspation when the mandible is pulled back by the patient with the aid of the dentist as said before . All the teeth that occluded uniformly on the articulator must have equally uniform contacts in the mouth, if not this mean the CR record is incorrect (centric-off).

Factors that contribute to maxillomandibular relation recording inaccuracy (centric –off) are may be caused by **biological difficulties** arising from lack of patient muscle coordination & control or **psychological difficulties** because patient &/or dentist are tired or nervous that is difficult to get a relaxed position of the mandible. **mechanical difficulties** due to unstable & poorly fitting record bases & displaceability of denture bearing tissues. Also, **materials consistency & equipments** used in record making must not be too hard like impression plaster, Z.O.E paste & not well-softened wax .**Type of the articulator** that used & finally **incorrect recording technique or mounting** used by the dentist & lack of dentist skill especially with difficult cases.

**3. Establishing the posterior palatal seal(p.p.s)of upper denture:** posterior palatal seal: defined as “the soft tissues along the junction of the hard and soft palates on which pressure within the physiological limits of the tissues can be applied by a denture to aid in the retention of the denture.



Recording of posterior palatal seal is very important in retention to provide a peripheral seal. **The denture posterior border which should rest on soft and resilient tissues, which can move along with the denture during function and prevent loss of peripheral seal referred as post dam or vibrating line.** posterior border of upper denture is determined in the mouth & transferred onto the cast. The vibrating line of the soft palate is used as a guide to p.p.s , usually is located slightly anterior to fovea palatinae or on it, the dentist observes closely vibrating line when the patient say (ah) & marks it with an indelible pencile from one hamular notch to the other, the trial denture base is now inserted so that this line is transferred to it & the excess of the record base is reduced by a prosthetic handpiece to this line. Then is recorded & drawn on the cast & carved as a V-shaped groove with 1.5mm width at its base & sharp at its apex & 1-1.5mm deep. The groove will form a bead on the denture that provide p.p.s. Two wide p.p.s can push the denture downward gradually & break the seal. Too high p.p.s can make tissue soreness.



**4. Phonetic & esthetic:** the appearance of the entire lower half of the face & its anatomical landmarks depends on the dentures. The appearance of the patient premature aging may be caused by the lack of support for the lips & cheeks due to improper setting of teeth or decreased V.D.O. Over support of lips & cheeks by teeth or thick denture flanges or increased V.D.O also affects esthetic.

The teeth color, size, shape also must be checked with patient gender, age, personality & skin color with taking patient's desire, acceptance & attitude into consideration.

Phonetic must be checked by the dentist which is affected by the V.D.O, overbite & overjet of anterior teeth , teeth position & tongue space.

\*(s) sound is the most interesting sound from a dental point of view as is mainly influenced by the teeth & palatal part of the prosthesis & it is common in nearly all languages of the world. (s) sound is produced by a small space formed between the tongue tip & rugae area during its pronounciation , the size & the shape of this space determine the quality of the sound.

**5. Teeth position:** finally the dentist must check that the anterior & posterior artificial teeth are arranged in their correct position in the articulator so that they will not cause cheek or tongue bite, or instability of the dentures. In addition, the five factors of occlusion must be checked with teeth setting like vertical & horizontal overlap, height of occlusal plane of lower trial denture, compensating curves . Also , orientation of occlusal plane of upper trial denture must be checked with the fox bite.

*Thank You*





**Q/ Define the incisal guidance angle.**