

GOOD MORNING



OCCLUSION IN COMPLETE DENTURE

NOMENCLATURE AND TERMINOLOGY

Occlusion:

“ Is defined as the relationship between the occlusal surfaces of the maxillary and mandibular teeth when they are in contact.-
GPT”

- ***Articulation:***

- It is defined as “The static and dynamic contact relationship between the occlusal surfaces of the teeth during function” - GPT

- NATURAL TEETH / ARTIFICIAL TEETH – IN CD

Ideal Requirements Of Complete Denture Occlusion:

1. Stability of occlusion at centric relation position in an area forward and lateral to it.
2. Balanced occlusal contacts bilaterally for all eccentric mandibular movements.
3. Unlocking the cusps mesiodistally to allow for gradual but inevitable settling of the bases .
4. Control of horizontal force by buccolingual cusp height reduction
5. Functional lever balance by favorable tooth to ridge crest position.
6. Cutting, penetrating and shearing efficiency of occlusal surfaces
7. Anterior incisal clearance during posterior masticatory function

These requirements can be most easily applied if the occlusion is divided into 3 distinct units

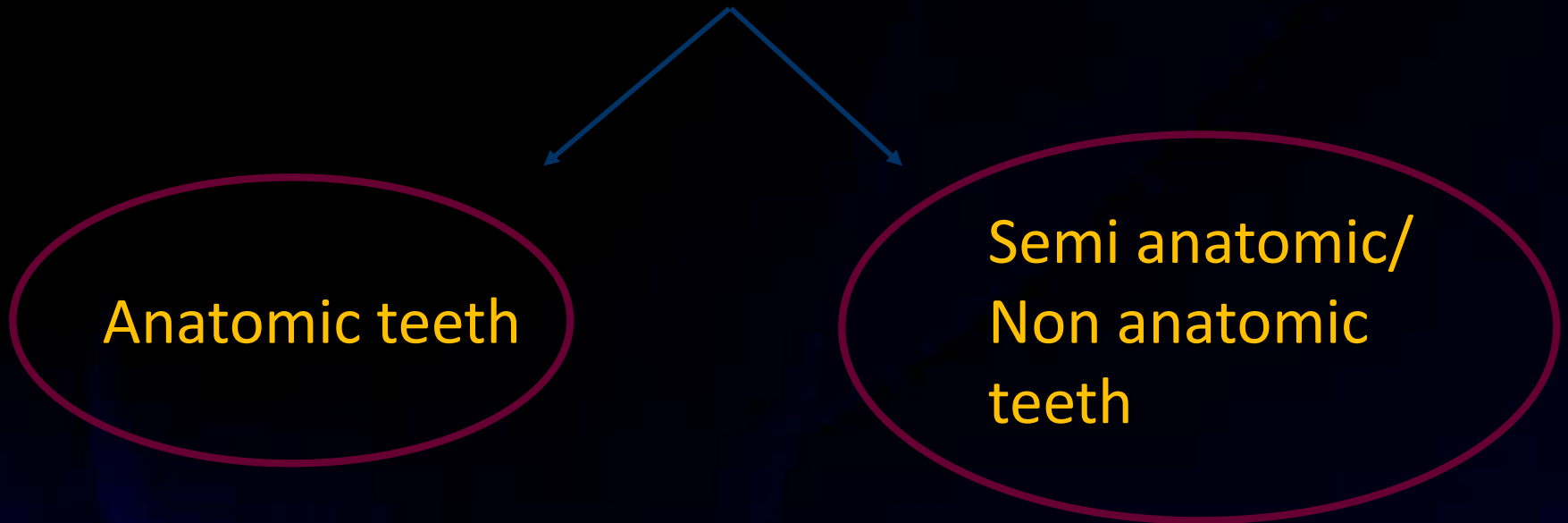
Incising
unit

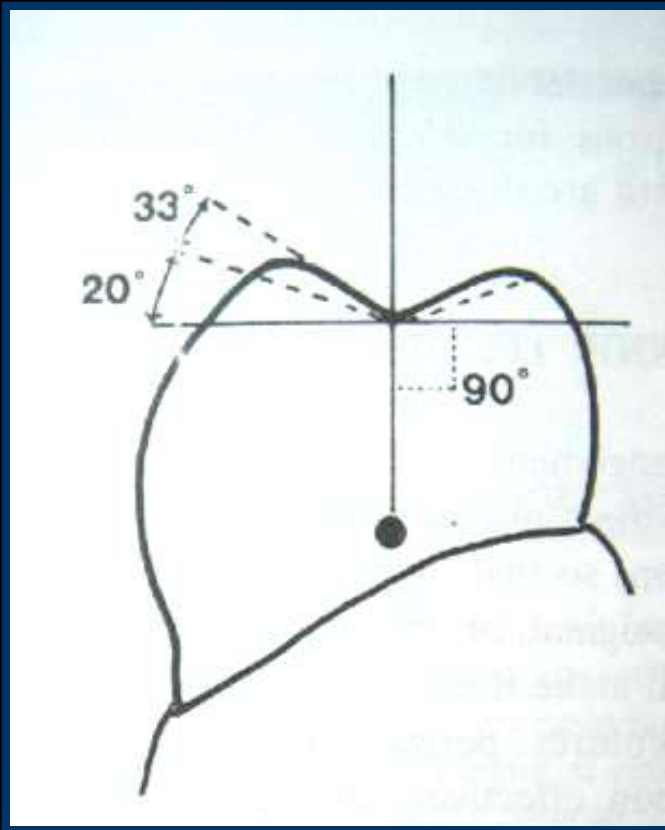
Working occlusal
unit

Balancing
unit

Occlusal Schemes Used In Complete Denture

The design of the posterior teeth can be divided into 2 main groups:





- **ANATOMIC** → 33° bucco-lingual inclines of anatomic teeth for patients with strong, well formed ridges
- **SEMIANATOMIC** → 20° bucco-lingual inclines of semi-anatomic teeth for patient with ridge contour is reduced by resorption
- **NON ANATOMIC** → 0° non-anatomic teeth for patient with flat, knife edge ridges

Cusp form

Advantage

Anatomic occlusion	<ul style="list-style-type: none">➤ Penetrate food more easily.➤ Resist rotation of denture bases through cusp interdigitation.➤ Provide better esthetics.➤ Act as a guide for proper jaw closure.
Non anatomic occlusion	<ul style="list-style-type: none">➤ Does not lock the mandible in one position.➤ Less time consuming procedure.➤ Minimises horizontal stress .➤ Easier to arrange in cross bite

Cusp form

Disadvantage

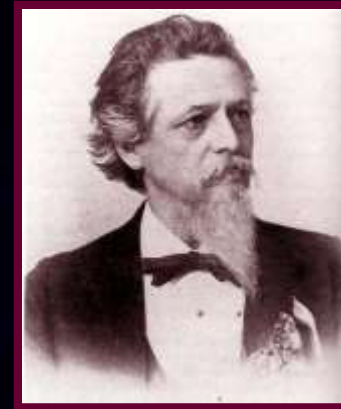
Anatomic occlusion	<ul style="list-style-type: none">➤ Precise jaw closure and base stability required for interdigitation.➤ Increased horizontal forces.
Non anatomic occlusion	<ul style="list-style-type: none">➤ Poor esthetics.➤ Decreased masticatory efficiency.➤ More difficult to get balanced occlusion.

Theories Of Occlusion

➤ Spherical theory



➤ Equilateral triangle theory

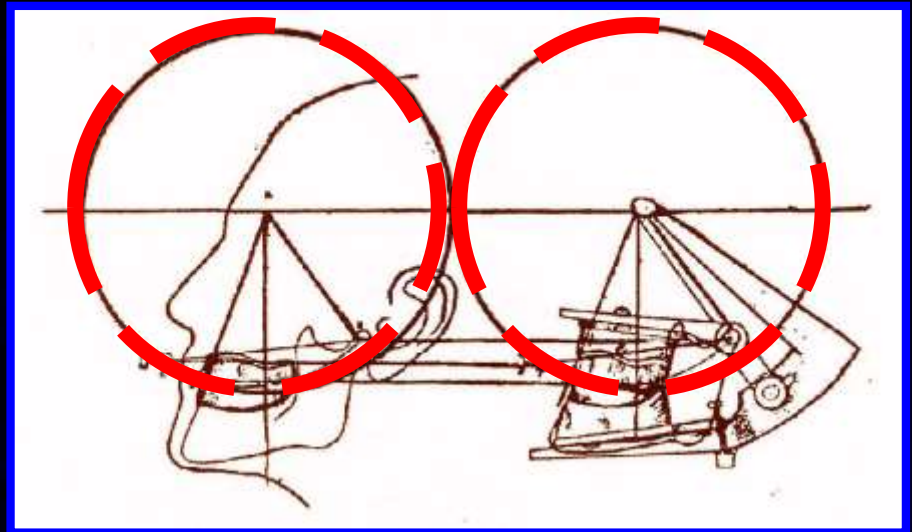
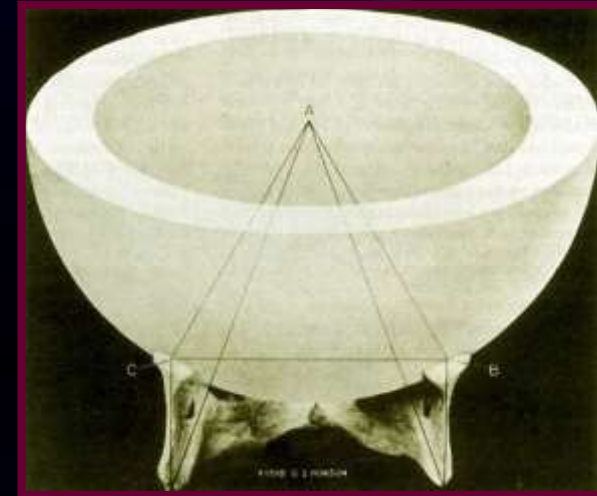


➤ Conical theory



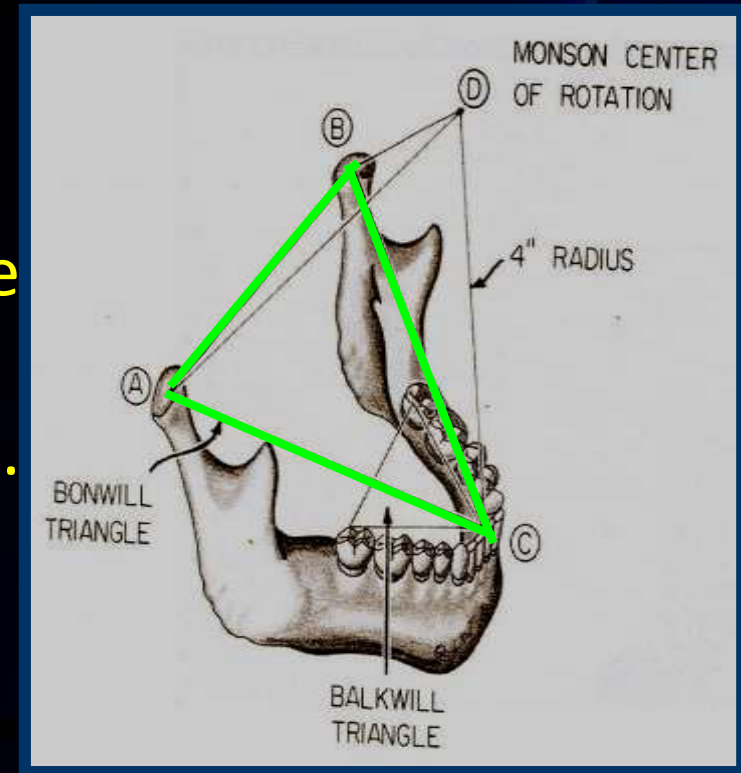
Spherical theory

- Monson(1918)
- Positioning of teeth with antero-posterior and medio-lateral inclines in harmony with a spherical surface.
- Lower teeth moves over the surface of upper teeth as over the surface of sphere with a diameter of 8inches(20cm).
- Centre of sphere is in glabella.
- Surfaces of the sphere passes through glenoid fossa along the articular eminences.



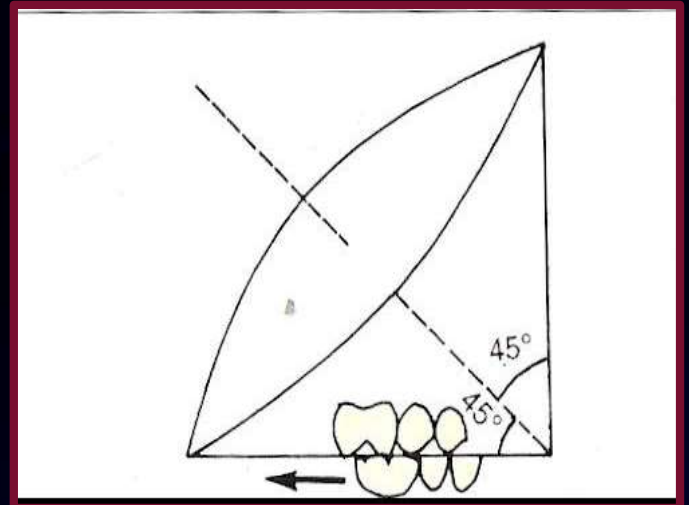
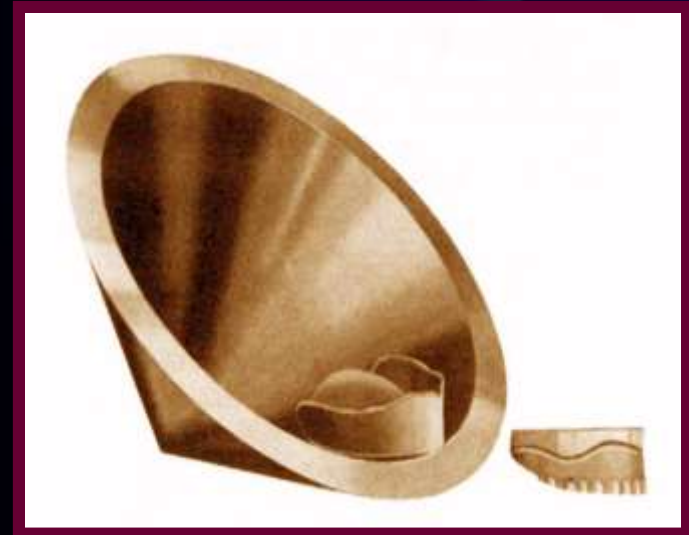
Equilateral triangle theory

- Bonwill(1858)
- The distance between the condyles is equal to the distance between the condyle and the midpoint of mandibular incisors.



Conical theory

- This theory was proposed by Hall
- Lower teeth move over the surfaces of the upper teeth as over the surfaces of cone with a generating angle of 45 degree with the central axis of the cone tipped 45 degree to the occlusal plane.



Concepts Of Occlusion

The concept of occlusion for complete dentures
2 categories:

**NON BALANCED
OCCLUSION**

**BALANCED
OCCLUSION**

NON BALANCED OCCLUSION

- **Spherical occlusion**
- **Organic occlusion.**
- **Transographics.**
- **Neurocentric occlusion concept of De Van**
- **Lingualized occlusion**
- **Monoplane occlusion**
- **Lineal occlusion**
- **Linear occlusion**
- **Physiologically generated occlusion**

BALANCED OCCLUSION

It is defined as “the bilateral, simultaneous , anterior and posterior occlusal contact of the teeth in centric and eccentric positions”-GPT

Importance Of Balanced Occlusion

- Improved stability of denture
- No single tooth will produce any interference or disocclusion of the other teeth.
- Preservation of ridges by better distribution of forces

Advantages:

1. bilateral balanced contacts during the terminal arc of closure help to seat the denture in a **stable position**.
2. Also bilateral balanced occlusion is important during activities such as **swallowing saliva, closing to reseat the dentures, and the bruxing of the teeth** during times of stress.
3. Patient with a balanced design do not upset the **normal static, stable and retentive qualities** of their dentures.
4. In bilateral balance **the bases are stable during bruxing activity**

Types of Balanced Occlusion

Balance may be:

Unilateral, bilateral, or protrusive.

Unilateral lever balance:

This is present when there is equilibrium of base on its supporting structures when a bolus of food is interposed between teeth on one side and space exists between teeth on the opposite side.

- This can be achieved by:
- Placing the teeth so that the resultant duration of force on the functioning side is over the ridge or slightly lingual to it.
- Having the denture base cover as wide an area on the ridge as possible.
- Placing the teeth as close to the ridge as possible.
- Using as narrow buccolingual width occlusal food table as possible.

Unilateral Occlusal Balance:

This is present when occlusal surfaces of teeth on one side articulate simultaneously as a group with a smooth uninterrupted glide.

Bilateral Occlusal Balance :

This is present when there is equilibrium on both side of the denture due to simultaneous contact of the teeth in eccentric occlusion.

It requires a minimum of three contacts for establishing a plane of equilibrium. The more contacts, more will be equilibrium

***FACTORS THAT AFFECT
OCCLUSAL BALANCE***

1. Condylar Guidance

2. Incisal guidance

3. Orientation of occlusal plane

4. Compensating Curves

5. Cuspal Inclination

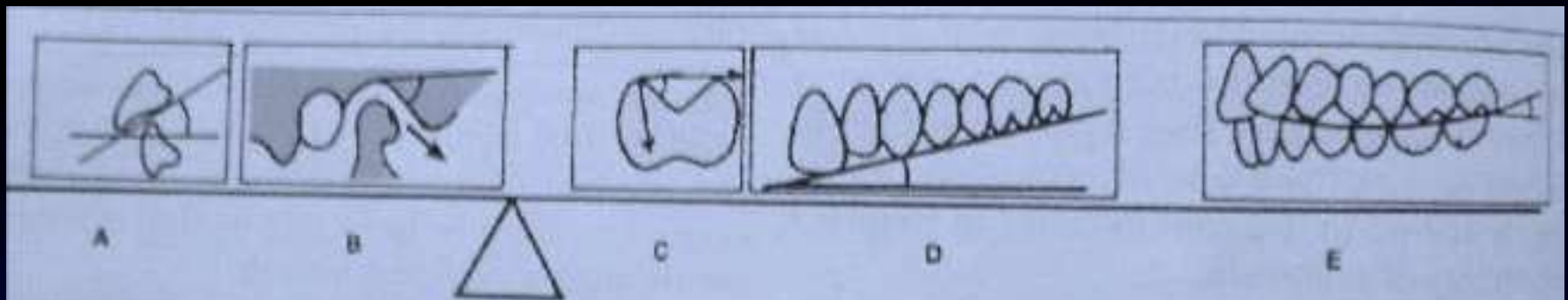
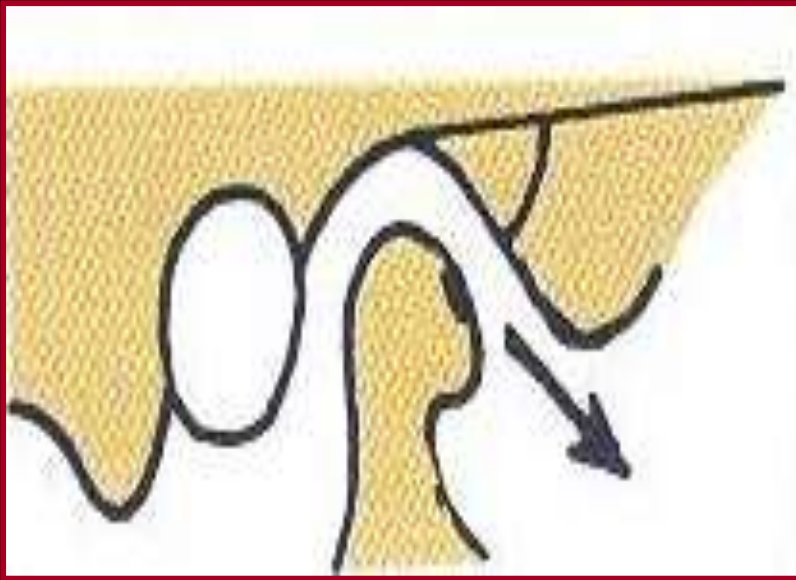


Fig. 10.85: Key (a) Incisal guidance, (b) Condylar guidance, (c) Cuspal angulation (d) Angle of plane of occlusion (e) Compensating curve. A balance of these five factors is required for balanced occlusion

Condylar Guidance

- It is the mandibular guidance generated by the condyles traversing the contours of glenoid fossa.
- It is determined on the patient by protrusive record
- The pathways followed by condyles are inherent for the patient and are not controlled by the dentist.
- The condylar elements of articulator must be adjusted to simulate as closely as possible the condyle paths of patient.

Average condylar guidance is about 25-30 degree.



Incisal Guidance

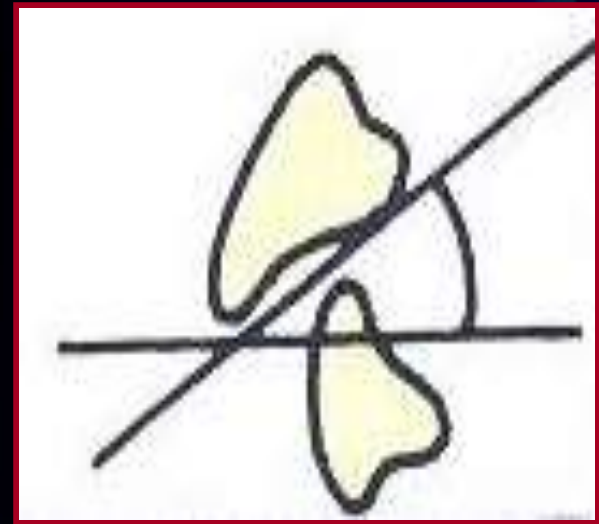
Defined as “The influence of the contacting surfaces of the mandibular and maxillary anterior teeth on mandibular movements” - GPT.

expressed in degrees of angulation

horizontal by a line drawn in sagittal

incisal edges of upper and lower

when closed in centric occlusion.



It is usually

from the

plane between

incisor teeth

- Greater the vertical overlap of anterior teeth

↓
Steeper incisal guidance

On forward movement → greater separation of posterior teeth.

- Greater the horizontal overlap of anterior teeth



flat anterior guidance

- Steep incisal guidance **requires** → steep cusps, steep occlusal plane, or steep compensatory curve


OCCLUSAL BALANCE

➤ Because of steep inclined planes

this type of occlusion is detrimental to the stability and equilibrium of denture.

➤ For complete dentures the incisal guidance should be as flat as esthetics and phonetics will permit.

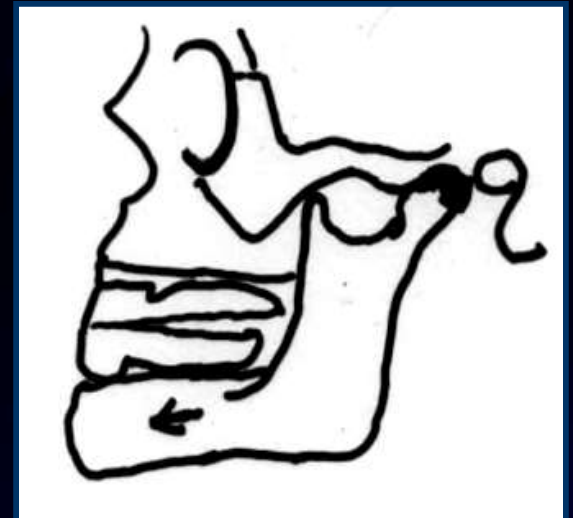
➤ On average it is about 10-20 degree

Orientation Of Occlusal Plane

- It is established in the anterior by the height of lower cuspid, which is nearly coincident with the commissure of mouth
Posterior - by the height of retro molar pad. It is also related to ala-tragus line.
- This plane is assumed to pass through 3 dental landmark central incisal point and summit of mesio-buccal cusp of last molar on either side.
- It is transferred to articulator with help of facebow.

Compensating Curves

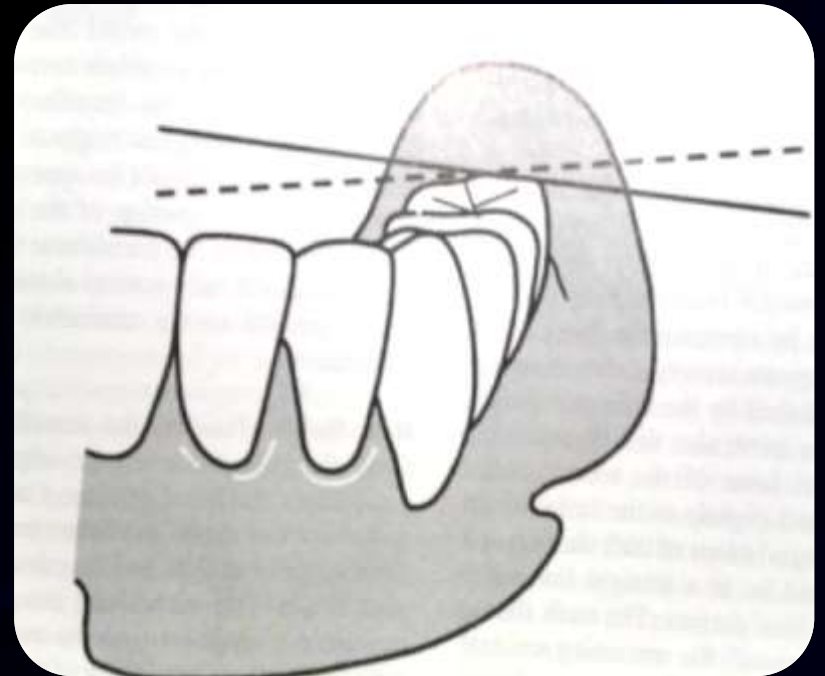
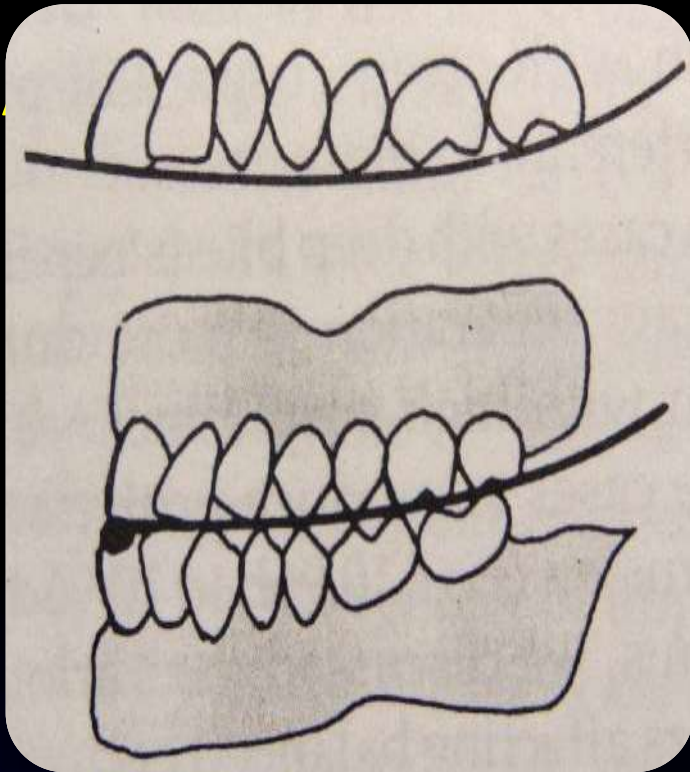
- It refers to Antero- Posterior and lateral curve produced in the alignment and arrangement of occluding surfaces of the teeth.
- They are the artificial components of the curve of spee and Monson which are found in the natural dentition.
- It compensates the “**CHRISTENSEN’S phenomenon**” that occurs in posterior region when protrusive movements are made.



Compensating Curves:

ANTERO -POSTERIOR

MEDIO-LATERAL CURVE



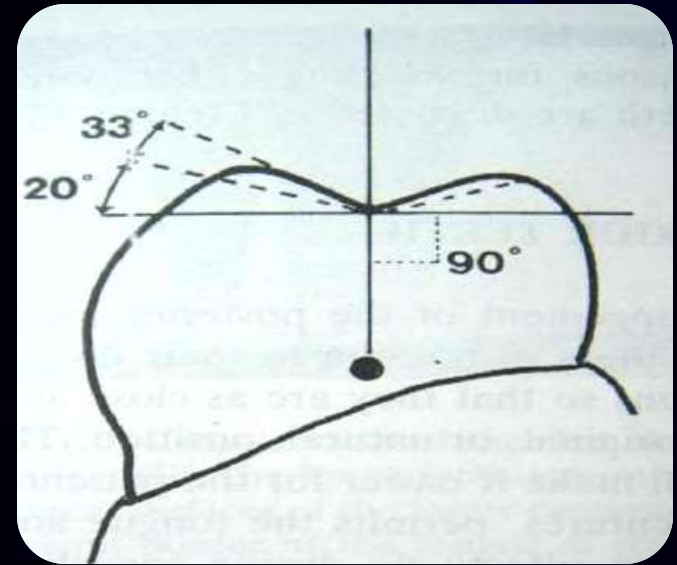
Cuspal Inclination

It refers to the angle between the cuspal incline and the horizontal cuspal plane.

The inclination of the cusp is made steeper



When the distal end of the lower tooth is set higher than the mesial end



The cuspal inclination can be reduced → When the distal end of the lower teeth is set lower than the mesial end.

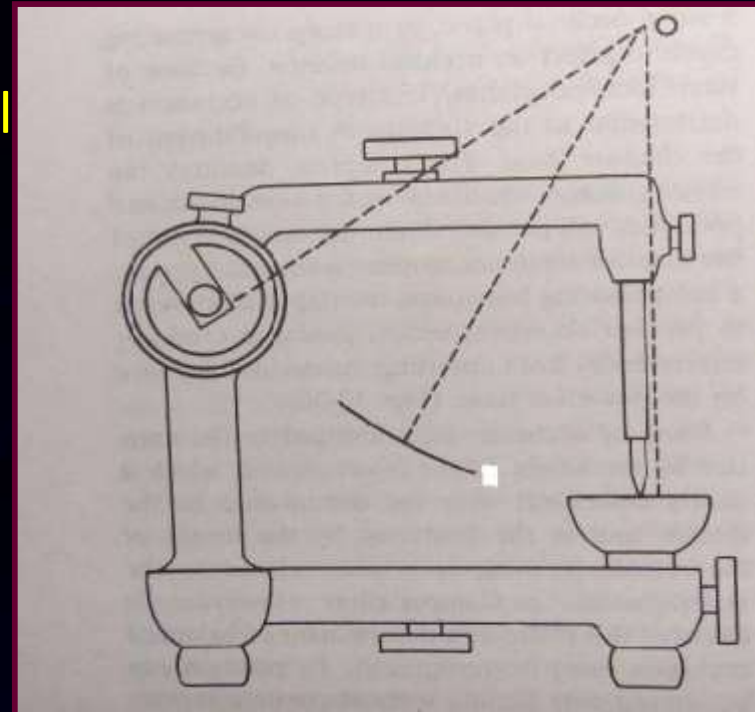
Similar adjustment can be made in the inclination of buccal and lingual cusps when the buccolingual long axis of the teeth are tipped. Thus tipping the teeth can produce compensatory curve and make the effective height of the cusp greater or less.

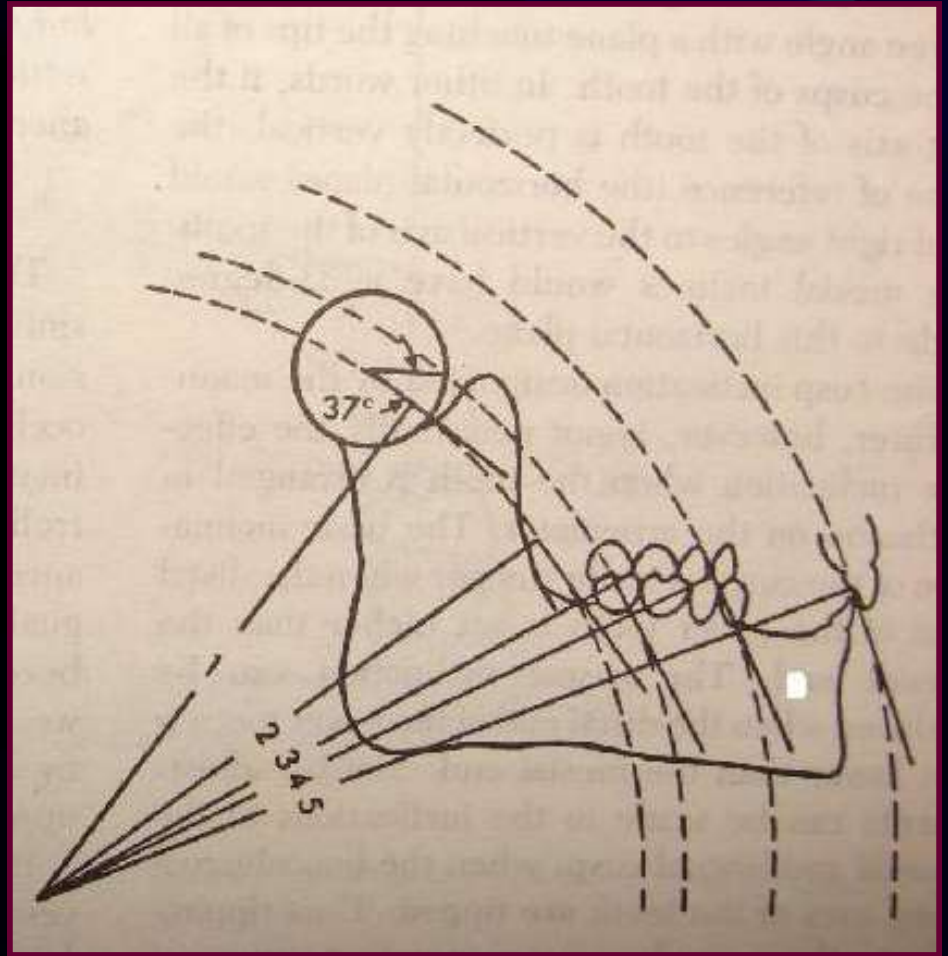
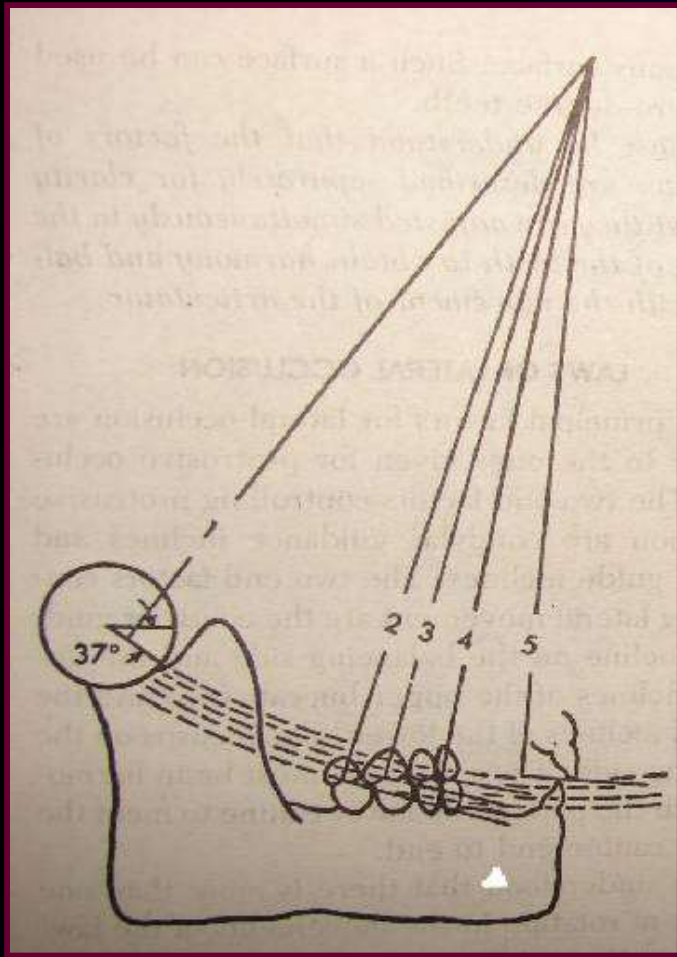
Influence Of Condylar Guidance And Incisal Guidance On Cuspal Inclination:

When the teeth are closer to the condylar guidance → the cuspal angulation is influenced by the condylar guidance.

When they are moved forward it falls under the influence of incisal guidance


- For balanced to be achieved the cuspal inclination should be parallel with the mandibular path.
- The rotational center of the mandibular path is determined by lines drawn at right angles from the center of the incisal guide table and from the condylar track.
- From this intersection curves are traced through the occlusal plane.

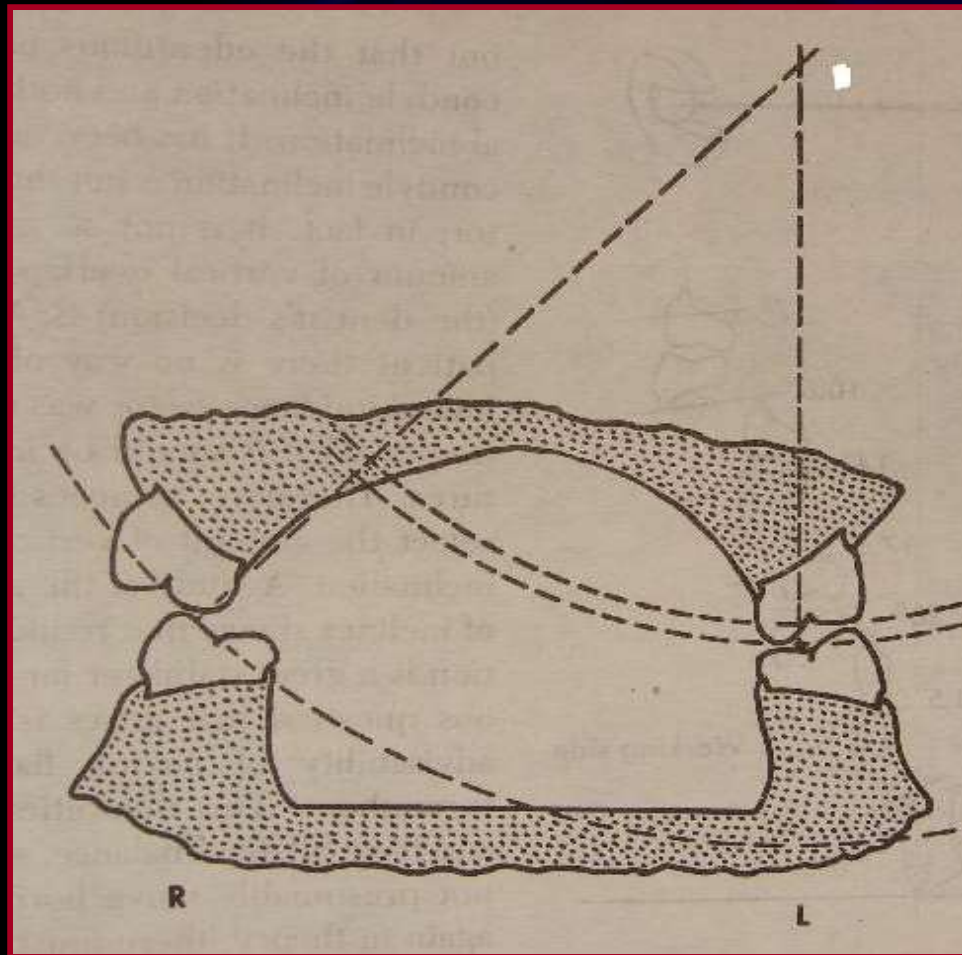




Lateral movements:

Posterior teeth  Parallel to path of mandibular movement.

- The center of rotation is established  Lines drawn right angles to the buccal inclines of mandibular lingual cusp on working side and another at right angles to the lingual surface of mandibular buccal cusp on the balancing side.
- All inclines involved in this lateral position must be on the curves of the arcs drawn from this rotational center.



Establishment of centre of rotation on lateral movement

Factors Affecting Protrusive Balance:

- Inclination of the condylar path on the articulator as recorded from patient
- The inclination of the incisal guidance taken from the patient
- Inclination of the plane of occlusion set to physiological factors
- Compensating curve set to harmonize condylar and incisal guidance
- Control of cusp height and tooth inclination

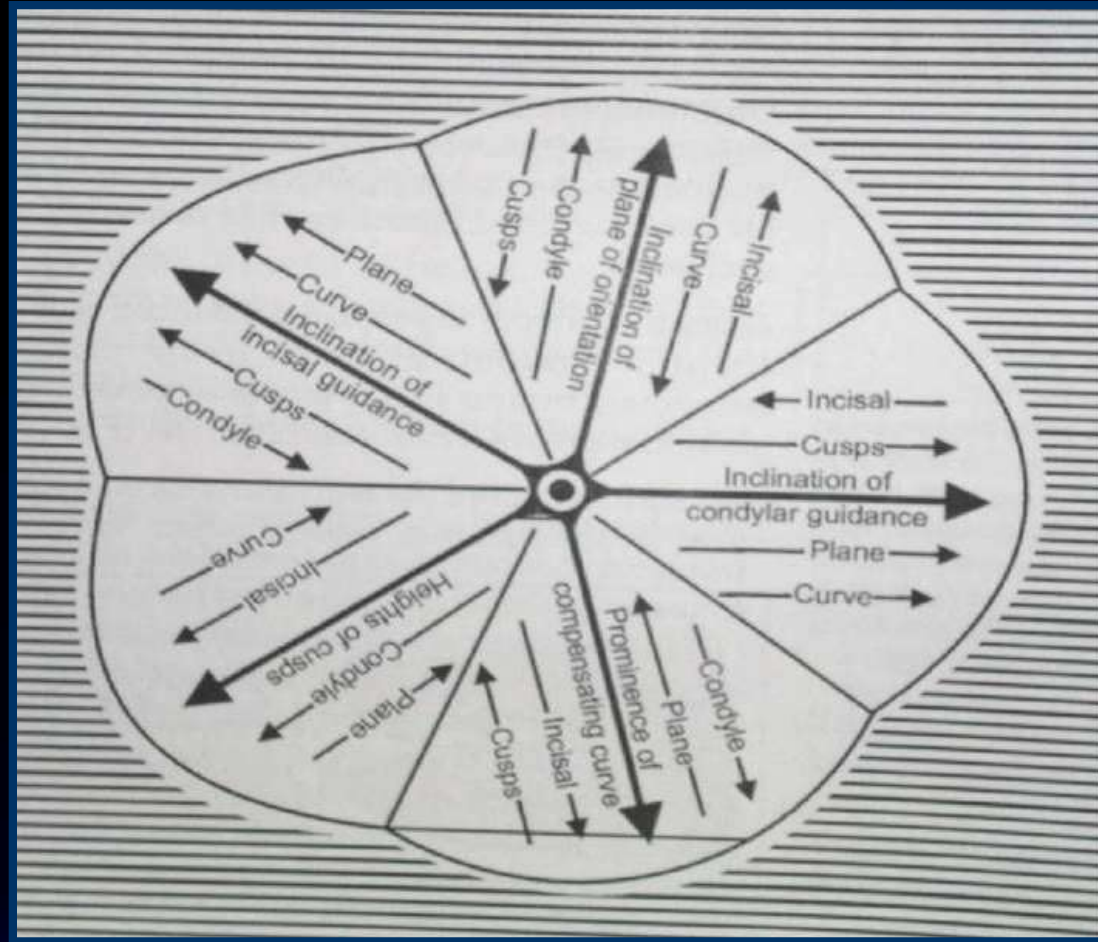
Factors Affecting Lateral Balance:

- Condylar inclination on the balancing side
- Inclination of the incisal guidance and cuspid lift
- Inclination of plane of occlusion on balancing and working side
- Compensating curve on balancing and working side
- Bennett side shift on working side
- Buccal cusp height or inclination on balancing side
- Lingual cusp height or inclination on the working side

Hanau's Quint.

➤ Rudolph L. Hanau formulated five factors that govern the balanced articulation known as *Hanau's quint*.

- **Condylar guidance**
- **Incisal guidance**
- **Compensating curves**
- **Relative cusp height**
- **Plane of orientation of occlusal plane**



Bouchers concept

Boucher proposed three factors for balanced occlusion:

- Orientation of occlusal plane, the incisal guidance and condylar guidance.
- The angulation of cusp is more important than the height of cusp
- The compensating curve enables to increase the height of cusp without changing the form of tooth