PRINCIPLES OF ARTICULATION

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Objectives

- What is an articulator?
- What is the purpose of an articulator.
- Discuss the types of articulators and applicable uses?
- Discuss the terminology of Articulators.
- Define Arcon vs Non-Arcon.
- Discuss patient cast orientation to the articulator.
Articulator- A mechanical device that represents the temporomandibular joints and jaw members, to which maxillary and mandibular casts may be attached to simulate some or all mandibular movements.

TYPES OF ARTICULATORS

Simple hinge or non-adjustable

Semi-adjustable

Fully-adjustable
Articulator Design

- Arcon - condylar element on lower
  - Just like the condyles are attached to the mandible
  - Mechanical fossae located on the upper member just like the glenoid fossae

- Non Arcon - condylar element on upper
  - Unlike natural anatomy
  - The condylar path (glenoid fossae) is located on the lower member
Arcon Articulator: Hanau Modular Semi Adjustable Articulator

Arcon Articulator: condylar element on lower element. Glenoid fossa on upper.
DETERMINANTS OF OCCLUSION

Posterior
1) Right TMJ
2) Left TMJ

Anterior
1) Anterior Teeth
Posterior Determinants of Occlusion

Posterior Determinants

1) Right TMJ
2) Left TMJ

The condylar guidance is a fixed factor, and the TMJs are the posterior controlling factor in mandibular movement.
Anterior Determinants of Occlusion

The anterior teeth:
Determine the movement of the anterior portion of the mandible.

- *Anterior guidance is variable since it can be altered by:*
  - restorations,
  - extractions,
  - orthodontics,
  - attrition, etc.
ARTICULATOR REVIEW:
Hanau Modular Semi Adjustable Articulator

Posterior Determinants:
Horizontal Condylar Guidance: Angle of Condylar Descent
1. Fully Adjustable vs. Semi-Adjustable Articulators

- Fully Adjustable Articulators:
  - Horizontal Condylar Guide
    - Angle of Condyle descent
      - protrusive wax record
      - bite registration materials
  - Bennent Movement & Angle:
    - Using intra oral recordings

- Semi-Adjustable Articulators:
  - Horizontal Condylar Guide
    - Angle of Condyle descent
      - protrusive wax record
      - bite registration materials
    - Pre-programmed in your articulator
**BENNET ANGLE**

The angle made by a line drawn from the point of origin of the balancing condyle to the final positions in Protrusion and mediotrusion.

- One leg of the angle is formed by a line made in a protrusive movement.
- The other is made from a line drawn from the point of origin and the final point of the ant. Teeth after the mediotrusive orbit.
REVIEW

Hanau Modular Arcon Articulator and the Anterior Determinant: Anterior Teeth
Purpose of Guide Table

- Maintain the relationship between casts
  - Protecting the cast from wear

- Uses of articulated casts
  - Evaluation of occlusion
  - Evaluation of tooth position
  - Evaluation of tooth form
  - Evaluation of gingival tissues
  - Fabrication of indirect restorations
CAST ORIENTATION

- Hinge Axis is a repeatable reference
- For the highest possible accuracy cast should be mounted as close to this axis of rotation as possible.
CAST ORIENTATION:
Centric Relation vs. Maximum Intercuspation

If the patient is asymptomatic, and has a sufficient number of teeth to consistently close into maximum intercuspsation, then maximum intercuspsation should be used for cast orientation.
Review

- **Fully Adjustable Articulator**
  - Facebow: Will give an exact Hinge Axis
  - Protrusive Movement: A curved protrusive movement as in the patient.
  - Bennett Movement: Exact

- **Semi-Adjustable Articulator**
  - Facebow: Will give an approximate Hinge Axis
  - CR Record: Giving a straight line protrusive movement.
  - Bennett Movement: Approximate
Facebow Transfer and Articulation of Casts