Types of Articulators
Lecture notes

Abdulsalam A. Zwiad
BDS, HD., M.Sc. FIHTS, Ce.Impl.
Assoc. Prof. Faculty of Medical Sciences
Queen Arwa University
Former Assist. Prof. Baghdad University
Definition

► It is a mechanical device represents the TMJ, maxillary and mandibular arches.

► It can be used to hold the upper and lower casts according to their relationships to facilitate the purposes of diagnosis and arrangement of artificial teeth outside the patient mouth.

► It is an instrument that acts as the patients in their absence and provide media of working without the interference of cheek, lips, saliva and tongue.
Articulation requirements

- It must accurately maintain centric relation or occlusion.
- Casts must be easily attached and removed.
- The pin must be adjusted in contact with the incisal table.
- It must open and close on a hinge.
- There must be adequate distance between the upper and lower arms.
- It must be stable on the work-bench.
- It must not be too heavy.
Classification of Articulators

Arc of occlusion and dimensional measurements of the jaws relations could be transfer to the articulator according to its simplest or adjustable articulation depending to the types of articulators.
In this lecture we try to give a simplest presentation about the various methods of classification articulators.
**Type I Simple hinge articulators**

Consists of two united arms which have the ability of opening and closing in a hinge movement based on the Bon-Will triangle concept which proposed that there is 10 cm. (4 inch) distance between both condyles and 10 cm. distance between each condyle and the incisal point, that the upper and lower teeth move in relation to each other as guided by the condylar control and incisal point.
A view of simple hinge articulator
Type II Mean Value Articulator

This type proposed that the articulator provide lateral and protrusive movement and based on average condyler guidance (30°) and incisive guidance (10°) e.g.: gysi articulator.
A view of Mean value Articulator
3 **Adjustable Articulator**

They are:

A) semi-adjustable
B) Fully adjustable articulators
A) Semi-adjustable Articulator

This type depends on face bow transfer and protrusive condylar path obtained from the patient mouth while the lateral condylar path is adjusted according to an average value by special formula:

\[ L = \frac{H}{8} + 12 \]  

(hanu`s formula)

\[ H = \text{protrusive} \quad \text{L} = \text{lateral} \]
A view of an adjustable articulator with a face bow transferred
B) Fully adjustable articulator

The horizontal and later condylar path inclination can be obtained from the patient mouth beside the using of face-bow.
Face bow

- Face bow consist of U-shape frame which is large enough to external from the TMJ.
- In have the condylar rods attached to the condylar region and there is the fork which touch and hold the upper occlusion rim.
- The condylar rods position in front of external auditory meatus 13mm. on the line extend from outer canthus to the top of the tragus.
- The face bow have the functions of locating the hinge axis and related the maxillary cast to this axis and then to facilitate the mount of the upper cast.
B ) Kinematics' Face bow

It has the ability to locate the exact position for the center of rotation by using special marker and by closing and opening the mouth this marker can record many points that it is finally will record or mark only one point provide the pure rotation on it with out translation to an other point .So this point will be called the center of rotation which determine the terminal hinge axis exactly.
Another method of classifying Articulators

Cl. I - Only vertical movement (hinge)

Cl. II - Vertical and horizontal movement - no facebow mounting.

Cl. III - Uses average equivalents for setting the articulator elements and accepts facebow registration.

Cl. IV - Accepts three dimensional dynamic registrations and requires a face-bow mounting.
1. It is another type of articulator with the equivalent condylar guides fixed to the upper member and the hinge axis to the lower member;

2. An instrument that maintains a constant relationship between the occlusal plane and the arcon guides at any position of the upper member.
Importance of Hinge Axis

A healthy T.M.J. provides a "hinge axis" motion of the mandible with an ideal mandibular arc of closure to the centric occlusion or relation.
Thank you