OCCLUSION, ARTICULATORS, FACEBOW

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INTRODUCTION

OCCLUSION

- Dynamic biological relationship of components of the masticatory system that control tooth contacts during function and dysfunction

- It is the integrated action of the jaw muscles, TMJ and teeth
Muscles + Joints + Teeth = OCCLUSION

www.myotronics.com
Occlusion

- Important to the provision of comprehensive patient care.
- Relevant to all disciplines in dentistry
- Restorative dentistry and prosthodontics: tooth restoration requires recognition of the importance of occlusal form and tooth contact patterns at an appropriate OVD, for optimizing jaw function
An understanding of the importance of the occlusion is paramount for enhancing jaw function, defining lower face height and aesthetic needs, as key issues in optimizing oral health.
Intercuspal contact (IC)
Contact between cusps, fossa, marginal ridges of opposing teeth

Intercuspal position (ICP)
Position of the jaw when teeth are in IC

Maximum intercuspation (MI)
Contact of teeth with maximum clenching
Centric occlusion (CO)

The tooth contact position when the jaw is in centric relation

CO may or may not be the same tooth contact R/S as ICP

Tooth contact (CO) when the jaw is in CR may be more retruded than at ICP
Retruded jaw position (RP)

The position of the jaw when the condyles are in a physiologically acceptable guided position for the recording of transfer record

Retruded contact position (RCP)

The contact position of the teeth when the jaw is in RP
Centric relation (CR)

The maxillomandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective discs with the complex in the anterior-superior position against the slopes of the articular eminence.

This position is independent of tooth contact.
TMJ - Condyle at CR

Iven Klineberg, Rob Jagger, 2004

www.baileydds.com
Summary of definitions

ICP, CR, RP

IC, CO, RCP
Postural jaw position (PJP)

Position of the jaw when an individual is sitting or standing upright when relaxed and alert.

A free way space or speaking space is present.

Occlusal vertical dimension (OVD)

The vertical height of lower third of the face when teeth contact in ICP.
Lateral jaw positions

**Non working/balancing**
- The side of the jaw that moves towards midline
- The side opposite the chewing side

**Working side**
- The side of the jaw that moves laterally away from the midline
- **Chewing side (where the chewing occurs)**
  - Canine guidance
  - Group function
**Bennet movement**: The bodily lateral movement of the mandible resulting from the movements of the condyles along the lateral inclines along the mandibular fossa.

**Bennet Angle**: Angle formed by movement of balancing condyle with sagittal plane during lateral jaw movement.
Posselt (1952) described the full range of jaw movement in 3 planes by tracing the path of lower incisor teeth as the jaw is guided through the border paths.
POSSELT’S BORDER MOVEMENTS

Sagittal view

Horizontal view

Frontal view

Iven Klineberg, Rob Jagger, 2004
ARTICULATORS

A hinged mechanical device to which maxillary and mandible casts are attached, to reproduce relationship of patient’s maxilla to mandible in ICP and for lateral and protrusive jaw movements.
Uses of articulators

- Study the way teeth occlude for diagnosis and treatment planning
- Allow formation of occlusal surfaces during lab preparation and adjustment of fixed and removable prostheses and indirect dental restorations
TYPES OF ARTICULATORS

- SIMPLE HINGE
- AVERAGE VALUE (PLANE-LINE)
- SEMI ADJUSTABLE
- FULLY ADJUSTABLE
SIMPLE HINGE

- Single hinge movement only
- No lateral movement
- Smaller than patient’s jaws
- Very limited value in restorative dentistry and prosthodontics but may allow preliminary evaluation of static tooth arrangement on study casts
- Condylar angle fixed at 30°
- No provision of adjustment for lateral mandibular shift
- Adjustable incisal guidance
- Considered sufficient for reproducing ICP on study casts
- Produce an approximation of condylar movements and used to design and prepare complete dentures and simple restorations
Allow adjustment of condylar inclination and Bennet angle

- Intercondylar width fixed at 110mm

- Condylar and Bennet angle are obtained from protrusive and lateral occlusal records or are set an average values

- Incisal guidance are made by reference to the O/B and O/J of anterior teeth, or if the teeth are lost, an average value can be set.
Recommended for most dental restorations

More accurate than average value

Allows increase of OVD by raising the height of articulator pin

Arcon/non-arcon: the choice is operator preference
**SEMI ADJUSTABLE**

**Arcon**
- Fossa box in the upper member
- Condylar sphere in the Lower member
- Duplicates arrangement of TMJ

**Non-arcon**
- Condylar ball is attached to upper member
- Slot mechanism attached to lower member
SEMI ADJUSTABLE-NON ARCON

Dentatus

Condylar guidance

Iven Klineberg, Rob Jagger, 2004
FULLY ADJUST USTABLE

- Complex
- Designed to duplicate TMJ features
- Condylar settings may be determined by pantographic and stereographic records
FULLY ADJUST USTABLE

ARCON TYPE

Iven Klineberg, Rob Jagger, 2004
An instrument that records the relationship of the maxilla to the hinge axis of rotation of the mandible.

It allows the maxillary cast to be placed in an equivalent relationship on the articulator.
In order to identify true hinge axis, hinge axis locator and hinge axis face bow are necessary.

Facebows are commonly used with an arbitrary hinge axis that is located 13mm along a line drawn from the upper aspect of the superior border of the tragus of the ear to the outer canthus of the eye.

Other arbitrary point of reference of the TMJ-external ear canal.
FACEBOW

- Allows transfer of intercondylar distance
- In dentate patients, the facebow fork is used to locate the occlusal and incisal surfaces of the maxillary teeth. Wax impression compound attached to the fork must locate the tooth cusp
- In edentulous patients, the fork is attached to a maxillary occlusal rim
FACEBOW
FACEBOW

Iven Klineberg, Rob Jagger, 2004
Maxillary cast mounted using facebow record
-Slidematic facebow with Denar articulator-

Iven Klineberg, Rob Jagger, 2004
Summary

- Remember and understand occlusion-definitions
- Function and types of articulators
- Function of a facebow
References

- www.uic.edu.com
- www.myotronics.com
- www.baileydds.com