Morphologic and Functional Occlusion

Occlusal Examination

Morphologic Occlusion:
The gross geometric relationship within and between the maxillary and mandibular dental arches. Any deviation from a physiologically acceptable relationship called a “malocclusion.”

Intra-arch Morphologic Occlusion:

A. Occlusal Plane (dependent on dental arch integrity):
The common plane established by the incisal and occlusal surfaces of the teeth. Not a true geometric plane but the mean of the curvature of the surfaces.

Intra-arch Morphologic Occlusion:

1. Curve of Spee Anterior posterior curve of the occlusal plane, concave up and convex down.
Intra-arch Morphologic Occlusion:

2. Curve of Wilson
   Transverse curve of the occlusal plane, concave up and convex down.

B. Intra-arch Morphologic Malocclusion
   (Occlusal Plane Problems):

1. Crowding
2. Missing teeth
3. Ankylosed teeth.

Inter-arch Morphologic Occlusion:

Described in three planes of space for anterior & posterior teeth:
A. Sagittal (AP)
B. Horizontal (Transverse)
C. Vertical

A. Sagittal Plane
   (Anterior Posterior)

1. Anterior Teeth
   Horizontal Overlap (Overjet)
   Clinical Assessment
   Millimeters facial Mx to facial Mn incisor; negative measurement if anterior cross bite

2. Posterior Teeth
   Angle Classification
   (Edward Angle, 1900)
• **Angle Class I** Mx
  1st molar MB cusp opposes Mn 1st molar buccal groove
• **Angle Class II** Mx
  advanced relative to Mn
• **Angle Class III**
  Mn advanced relative to Mx

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**Angle II**

• Division 1: flared maxillary incisors
• Division 2: retroclined maxillary incisors, typically associated with deep vertical overlap

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**Clinical Assessment**

If posterior missing teeth use the Mx canine

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**B. Horizontal Plane (Transverse)**

1. **Anterior Teeth**
   Dental midlines

   **Clinical Assessment**
   Mandibular dental midline relative to maxillary midline

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2. **Posterior Teeth**
   Cusp/fossa relationship with buccal overjet, ideal relationship provides axial loading of teeth

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B. Horizontal Plane
(Transverse)

Clinical Assessment
Variation from posterior buccal crossbite with Mx buccal centric cusps and Mn lingual centric cusps ... bilateral or unilateral, one tooth or multiple

Clinical Assessment
to complete lingual crossbite with Mx arch completely outside the Mn dental arch; evidence of a significant Mx to Mn arch width discrepancy

C. Vertical Plane

1. Anterior Teeth:
Vertical overlap (overbite)

Clinical Assessment
Millimeters incisal edge Mx to incisal Mn incisor; negative measurement if anterior crossbite. Alternately % of Mn facial surface covered by Mx tooth in IP.

Functional Occlusion:
Contact relationships of the teeth. Occlusal interferences are functional contacts forcing the mandible to deviate from a normal pattern of movement. (Posselt)
A. Intercuspal Occlusal Contacts

1. Posterior teeth protect anterior teeth: Ideal relationship, axial loading of posterior teeth with lighter contact of anterior teeth.

Clinical Assessment: Use shimstock in articulating forceps and place sequentially over each maxillary tooth and have patient close and hold. Pull on shimstock, if it holds contact is present.

A. Intercuspal Occlusal Contacts

Clinical Assessment: Use mouth mirror to retract cheeks and lips.

B. Eccentric Occlusal Contacts

1. Working Side:
   a. Canine Guidance
   b. Group Function
   c. Posterior Guidance

2. Nonworking Side:
   a. No contact ideal
   b. Contact
   c. Interference
B. Eccentric Occlusal Contacts

3. Protrusive Contact:
   a. Anterior contact/guidance
   b. No posterior contact

C. Eccentric Occlusal Contacts

Clinical Assessment:
- Visualize potential occlusal contacts
- Confirm with shimstock
- Circle tooth class in contact for each movement: right & left lateral and protrusion.

D. Centric Relation Tooth Contact

1. Discrepancy between tooth contact in CR and the IP (IP/CR slide):
   most commonly between Mx mesial and Mn distal cusp slopes of centric cusps.

D. Centric Relation Tooth Contact

Clinical Assessment:
- Patient feedback regarding initial contact.
- Place ribbon, film or paper between teeth on side of initial contact.

Clinical Assessment:
- Guide jaw and have patient tap on initial contact lightly.
D. Centric Relation Tooth Contact

Clinical Assessment:
Identify location of initial contact.

D. Centric Relation Tooth Contact

Clinical Assessment:
Measure anterior component of slide to nearest 0.5 mm
Visually assess any lateral component of slide at the Mn dental midline.

Ideal Morphologic Occlusion

<table>
<thead>
<tr>
<th>Anterior Teeth</th>
<th>Posterior Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP</td>
<td>Angle I</td>
</tr>
<tr>
<td>2-3 mm Hor OJ</td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>Contact</td>
</tr>
<tr>
<td>2-4 mm Ver OB, 50%</td>
<td></td>
</tr>
<tr>
<td>Transverse</td>
<td>Normal buccal overjet</td>
</tr>
<tr>
<td>Midlines aligned</td>
<td></td>
</tr>
</tbody>
</table>

Ideal Functional Occlusion

A. Intercuspal Position: CR jaw position
1. Simultaneous posterior contact
2. Axial loading of posterior teeth
3. Lighter contact of anterior teeth

B. Anterior Excursive Guidance:
1. Canine Guidance/ or Group Function
2. Nonworking: NO contact
3. Protrusion: NO posterior contact
Thank you!