Alignment and Occlusion of the Dentition, Part II

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This material is taken from:


Wheeler’s Dental Anatomy, Physiology and Occlusion, Ash, Saunders, Chapter 16,

Video Clips Ash, Nelson.(2010) Wheeler’s Dental Anatomy, Physiology, and Occlusion, St. Louis, MO: Saunders CD
Objectives!

• Identify, compare, contrast and describe mandibular movement.
• Identify the mandibular movement indicated by the arrow on drawings.
• Identify, compare, contrast and describe the clinical significance of jaw relationships in mandibular movement.
Eccentric Mandibular Movements

- Eccentric movement is any movement of the mandible from the intercuspal position that results in tooth contact
- Three basic eccentric movements:
  - Laterotrusive
  - Protrusive
  - Retrusive
- Remember: Only the mandible can move!!!
- The Maxilla is stationary
Laterotrusive Movement

Laterotrusive: lateral mandibular movement that occurs when the mandible moves to the left or the right from maximum intercuspsation.
Laterotrusive Movement

- During lateral movement of the mandible, there is contra lateral (opposite side) condylar translation and ipsilateral (same side) condylar rotation.
- Named according to the side to which movement occurs.
Laterotrusive Movement:

**WORKING SIDE MOVEMENT/ Sagittal Plane**

- The **RIGHT condyle stays fixed and rotates**

  - This is also known as the “working side” or rotating side.

  - This example is in the sagittal plane. The mandible is making a **RIGHT lateral movement** (towards you the viewer).

  **Generally this is a rotational movement of the condyle, however some people also have a lateral component as well.**

- The **LEFT condyle which you cannot see in this view is the ORBITING CONDYLE**
Mediotrusive (Nonworking) Movement

- The side opposite the working side is called the non-working side, or the balancing side or Mediotrusive side. The mandible is making a RIGHT lateral movement (away from you the viewer).
Laterotrusive (Working) Movement

- Contacts can occur between the inner inclines of the maxillary buccal cusps and the outer inclines of the mandibular buccal cusps AND
- Between the outer inclines of the maxillary lingual cusps and the inner inclines of the mandibular lingual cusps
- Called working contacts
Mediotrusive (Nonworking) Movement

- Contacts can occur between the inner inclines of maxillary lingual cusps and the inner inclines of mandibular buccal cusps.
- Called nonworking contacts. In the natural dentition, all non-working side contacts create interferences to harmonious function.
When the mandible moves to the patient's left:

- When the patient moves his or her jaw to the left, the movement is called a left working (laterotrusive) movement and contacts on the left side are working contacts.
- The patient’s right side of this same movement is called a nonworking (mediotrusive) movement and contacts on the right side are nonworking contacts.
When the mandible moves to the right

- The movement to the right is called a right working (laterotrusive) movement and contacts on the right side are right working contacts.
- The left side of this movement is called a nonworking (mediotrusive) movement; and contacts on the left side are non-working contacts.
Lateral excursion

The side towards which the mandible moves is referred to as the working side.

The side from which the mandible is moving is referred to as the non-working side.

**Arrows indicate the direction of movement of the mandible.**
Arrow diagram questions!

- Each arrow diagram is question dependent. Although only the mandible moves, the question may ask which maxillary cusp “moves” through the space indicated.
Role of Anterior Teeth in Laterotrusive Movement

- Maxillary and mandibular canines contact during right and left lateral movements.
- Contacts can occur between the labial surfaces and incisal edges of the mandibular canines and the lingual fossae and incisal edges of the maxillary canines.
Protrusive Movement

Protrusive: mandibular movement that occurs when the mandible moves forward from the maximum intercuspation position.
Protrusive Contacts

- Any area of a tooth that contacts an opposing tooth during protrusive movement
- In a normal occlusion the predominant protrusive contacts occur on the anterior teeth between the incisal and labial edges of the mandibular incisors against the lingual fossa areas and incisal edges of the maxillary incisors
Protrusive Contacts

- During protrusive movement, posterior contacts can occur between the distal inclines of the maxillary teeth and the mesial inclines of mandibular teeth.
- Note the position of the condyle in relation to the occlusal contacts during protrusive movement!
Protrusion
Retrusive Movement

- **Retrusive**: when the mandible moves posteriorly from the maximum intercuspation
TMJ movement with tracings of DB cusp of #30 onto #3
A tracing of the path of the DB cusp of the mandibular 1st molar onto the maxillary first molar.

Arrows represent the path of the ML cusp of the maxillary 1st molar onto the mandibular first molar.
Arrows represent the path of the DB cusp of the mandibular 1st molar onto the maxillary first molar

These pictures represent three different Mandibular movements: Protrusive, Laterotrusive, and Mediotrusive.

Laterotrusive:
In this movement the DB cusp of the mandibular 1st molar moves through the buccal groove in a working lateral movement.

Mediotrusive:
In this movement, the DB cusp of the mandibular 1st molar moves in a medial and lingual direction (obliquely) in a non-working movement.

Protrusive:
In this movement, the DB cusp of the mandibular 1st molar moves forward along the central fossa line.
Tracing Movements

- **Red Arrows** = Tracing of the path of the DB cusp of the mandibular first molar onto the maxillary first molar during mandibular movement.

- **Red Arrows** = Tracing of the path of the ML cusp of the maxillary first molar onto the mandibular first molar during mandibular movement.

- Centric cusp which traces on opposing tooth
Aids to assist with Occlusion Questions on Examinations

Arrow Diagrams to Illustrate Mandibular Movement

Static Occlusion Relationships
“The Picket Fence”

Maxillary and Mandibular Tracing Guide
Finished!