Temporomandibular Joint: TMJ

One of the most frequently used joints in the body

What is the function of the TMJ?
TMJ Functions

• Chewing
• Swallowing
• Yawning
• Talking
• Anything involving the jaw!
TMJ Joint Structure

• Made up of:
  – 2 bones
    • Temporal
    • Mandible
  – a disc that divides the joint into 2 joint spaces
  – a joint capsule
  – 4 ligaments
Temporomandibular Joint

Temporo-Mandibular Joint

1) Sagittal view of normal temporo-mandibular joint. Sliding joint type used in:
   - Chewing
   - Swallowing
   - Talking

2) Inflammation of the TMJ can cause:
   - Headache pain
   - Ear pain and pressure
   - Ringing in the ears
   - TMJ catching or locking
   - Change in bite
   - Neck, shoulder and upper back pain
Osteology of the TMJ

• Bones of the skull:
  – Frontal
  – Parietal
  – Temporal
  – Sphenoid
  – Occipital
  – Zygomatic
  – Mandible
  – Maxilla
  – Nasal
Osteology: The Mandible

- Angle
- Body
- Condyle
- Coronoid process

- Mental spine
- Neck
- Notch
- Ramus
The Mandible

• One bone, rests dependent upon muscle relaxation and forms 2 identical joints with a temporal bone on either side of the face
• Makes up the inferior part of the face
  – The “jaw”
  – Bony landmarks
Osteology: Temporal Bone

- Zygomatic process
- External auditory meatus
- Mastoid process
- Styloid process
Motions of the TMJ

- Mandibular depression
- Mandibular elevation
- Mandibular lateral deviation
- Mandibular protrusion or protraction
- Mandibular retraction or retraction
Resting position of the mandible:

- The condyle of the mandible is seated in the mandibular fossa of the temporal bone.
- The lips would be closed and teeth would be several millimeters apart.
Resting position of the mandible:

• This would be maintained by low levels of activity of the temporalis muscles
• You should be able to open your mouth enough to fit 2-3 finger widths between the front upper and lower teeth.

What motion is she performing with her mandible?
Ligaments & Other Structures

- 4 main ligaments suspend and/or limit excessive motion of the mandible.
TMJ & The Articular Disc

• The articular disc divides the joint space into upper and lower spaces.

• The movement of the disc is often the source of “clicking” that can be heard or felt by patients.

• It may or may not be a sign of pathology.
• During opening of the mouth, the condyles of the mandible move forward along the articular disc.

• This is a smooth movement unless the opening is excessive.

• Repeated excessive opening can cause trauma to the area and potential disc injury.
Myology of the TMJ

• 4 prime movers of TMJ
  – Temporalis
  – Masseter
  – Medial Pterygoid
  – Lateral Pterygoid
## TMJ Myology

<table>
<thead>
<tr>
<th>Masseter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Between the zygomatic arch of the temporal bone and the mandible</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Bilateral: elevation of mandible (closing mouth) \ Unilateral: lateral deviation (ipsilateral)</td>
</tr>
<tr>
<td><strong>Innervation</strong></td>
<td>Trigeminal nerve (cranial nerve V)</td>
</tr>
</tbody>
</table>
# TMJ Myology

**Temporals**

| Location | Origin: Temporal fossa  
Insertion: coronoid process and ramus of mandible |
|----------|-------------------------------------------------------------------------------------|
| Action   | Bilateral: elevation of the mandible (closing mouth)  
and retrusion of mandible  
Unilateral: lateral deviation (ipsilateral) |
| Innervation | Trigeminal nerve (cranial nerve V) |
### Medial Pterygoids

<table>
<thead>
<tr>
<th>Location</th>
<th>Internal angle of ramus of mandible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Bilateral: elevation of the mandible (closing mouth) and protrusion of mandible Unilateral: lateral deviation (contralateral)</td>
</tr>
<tr>
<td>Innervation</td>
<td>Trigeminal nerve (cranial nerve V)</td>
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</tbody>
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## TMJ Myology

<table>
<thead>
<tr>
<th>Lateral Pterygoids</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Inside the mouth near the condyle of the mandible</td>
</tr>
</tbody>
</table>
| **Action**         | Bilateral: depression of the mandible (opening the mouth) and protrusion of the mandible  
Unilateral: lateral deviation (contralateral) |
| **Innervation**    | Trigeminal nerve (cranial nerve V) |