The Temporomandibular Joint-Anatomy/Physiology
Evaluation/Treatment

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Anatomy

- Temporomandibular joint (TMJ)
  - Temporal bone
  - Mandible
  - Relationship with bony landmarks on skull
Condyle

- Medial/lateral measurement twice the anterior/posterior
  - Not pure hinge movement
  - Rotation with translation forward

- Attachments
  - Collateral ligaments - medial/lateral
  - Further anterior - temporals insertion on coronoid process
Disc

- Characteristics
  - Posterior portion thickest
  - Intermediate portion
    - In contact with condyle
    - Thinnest
    - Avascular, aneural

Figure 10. Side view of the craniomandibular system with TMJ insert.
Disc

- Attachments
  - Posterior ligament
    - Elastic
    - Passive-tension tissue
  - Lateral pterygoid-
    Superior fibers
  - Capsule-
    anterior/posterior only
Normal disc movement

- Moves as unit with condyle
- Held in place on condyle by ligaments (collaterals and posterior)
- First 11 mm of opening, disc stationary, while condyle rotates
- >11 mm, disc and condyle translate forward
- Disc rotates backward by tension of posterior ligament
- Condyle always in contact with intermediate portion
- Opening door analogy
Capsule

- **Synovial membrane**
  - Produces synovial fluid
  - Lubrication and metabolic exchange for avascular joint tissue (disc)

- **Temporomadibular ligament**
Muscles-Temporalis

- Origin-temporal fossa, superior to zygomatic arch
- Insertion-coronoid process of mandible
- Anterior, middle and posterior fibers
- Elevation of mandible
- Posterior fibers-retrusion, and deviation to same side
- Postural muscle
- Large muscle 53% of total mass of elevators
Temporalis

- Referral pattern - temple, along eyebrow, behind the eye or upper teeth
- Perpetual clencher
Muscles-Masseter

- Origin-zygomatic arch
  - insertion-mandibular angle and ramus
  - Sling with medial pterygoid
  - Together make up 57% of cross section of elevators-power chewer

- Synergist with temporalis for elevation but also retrudes jaw, lateral deviation to same side

- Chewing-first muscle to activate
Masseter

- Referral pattern: lower jaw, molar teeth and gum, maxilla, lower portion of mandible, temple eyebrow and to ear (externally)
- “Sinusitis”
Muscles-Medial Pterygoid

- Origin-inner surface of lateral pterygoid plate (under lateral pterygoid) insertion-ramus of mandible by the angle
- Elevation, protrusion and lateral deviation to opposite side
- Close relationship with lateral pterygoid
Medial Pterygoid

- Referral pattern: posterior mandible, mouth, below and behind TMJ including ear (internally) - not teeth
- Stuffiness in ear due to tensor veli palatini muscle unable to push medial pterygoid out of the way to dilate the Eustachian tube
- Swallowing difficult as restriction in protrusion of jaw
Muscles-Lateral Pterygoid

- Origin-lateral pterygoid plate of sphenoid, insertion-condylar neck, ramus of mandible and disc
- Elevation, protrusion, lateral deviation to opposite side (also initial opening)
Lateral Pterygoid

- Referral pattern-zygomatic arch, TMJ
- Major myofascial source of pain
- Cause disc and jaw to be unable to return to normal resting position
- Malocclusion of teeth
Muscles-Digastic

- Origin-mastoid notch(posterior)-symphysis of mandible (anterior) insertion-join by a common tendon to the hyoid bone

- Depression and retrusion of jaw

- Less forceful movement-assisted with long lever arm and gravity

- Active with swallowing and coughing
Digastrics

- Referral pattern-behind mandible towards back of ear, lower incisors
- Rarely in spasm due to forward head posture (stretch weakness-Kendall)
Disc Disorder
Internal Derangement

- Abnormal relationship of the articular disc to the mandibular condyle, fossa and articular eminence
- Review of normal biomechanics-condyle always in contact with intermediate portion of disc
Disc Disorder

Internal Derangement

- Disc is passive structure held in place by the collateral ligaments and the posterior ligament, with movement dictated by lateral pterygoid

- Posterior ligament is elastic so when stretched allows disc to move medially and anteriorly