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The Temporomandibular Joint - Physical Therapy Assessment/Treatment

Lori Steinley P.T., M.S.

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Definition

- The temporomandibular joint (TMJ) is a freely moveable (diathrodial) articulation between the condyle of the mandible and the temporal bone. It is a true synovial joint and, therefore, has much in common with the other synovial joints of the body. It does, however, possess certain unique developmental, anatomical, and functional characteristics which distinguish it from other joints of this type.

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Temporomandibular Disorder (TMD)

- A disorder of the temporomandibular joint(s) that causes pain, usually in front of the ear(s), sometimes in the form of a headache. Pain in the TMJ can be due to trauma, such as a blow to the face; inflammatory or degenerative arthritis, or poor dental work or structural defects that push the mandible back towards the ears whenever the patient chews or swallows. Grinding or clenching the teeth due to stress is a frequent culprit. Sometimes muscles around the TMJ used for chewing can go into spasm, causing head and neck pain, and difficulty opening the mouth normally.
- Treatment depends on the cause and severity of the problem, and can range from a mouth guard or medication to prevent nighttime tooth-grinding, to surgery. (from Medicine Net.com)

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Unique because of:

- Uses - speaking, mastication (chewing), swallowing, facial expressions, musical instruments, kissing, yawning, laughing, smiling
- Influences on both sides of body
- Variety of professionals that treat it
- Symptoms

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Symptoms

Symptoms associated with TMJ disorders may be:

- Biting or chewing difficulty or discomfort
- Clicking, popping, or grating sound when opening or closing the mouth
- Dull, aching pain in the face
- Earache
- Headache
- Hearing loss
- Migraine
- Jaw pain or tenderness of the jaw
- Reduced ability to open or close the mouth
- Neck or shoulder pain
- Dizziness
- Eye pain
- Difficulty swallowing
- Blurred vision
- Teeth malalignment
- Tinnitus

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Occurence

- Incidence/prevalence
  - 75% of the population has one sign of TMD
  - 33% of the population has one symptom that would cause them to seek treatment
  - Women ages 20-40, 3x as likely to have jaw problems
  - Increasing due to increased stress, use of computers and dentists being more aware of symptoms.

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Professionals Involved with TMD

- Treatment
  - Primary referrals from: Dentist, oral surgeons, orthodontists, doctor, psychologist, neurologist, ear/nose/throat specialist
  - Treatment: Physical therapist, dentist (mouth guard), doctor (medication-primarily muscle relaxers), psychologist (stress reduction and biofeedback), chiropractors

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History

- Spasm of masticatory muscles
- Arthritis
- Vitamin deficiency
- Endocrine disorder

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Clinical Symptoms

- Acute muscle disorders
- Disc-interference disorders
- Inflammatory disorder
- Chronic mandibular hypomobilities
- Growth disorders

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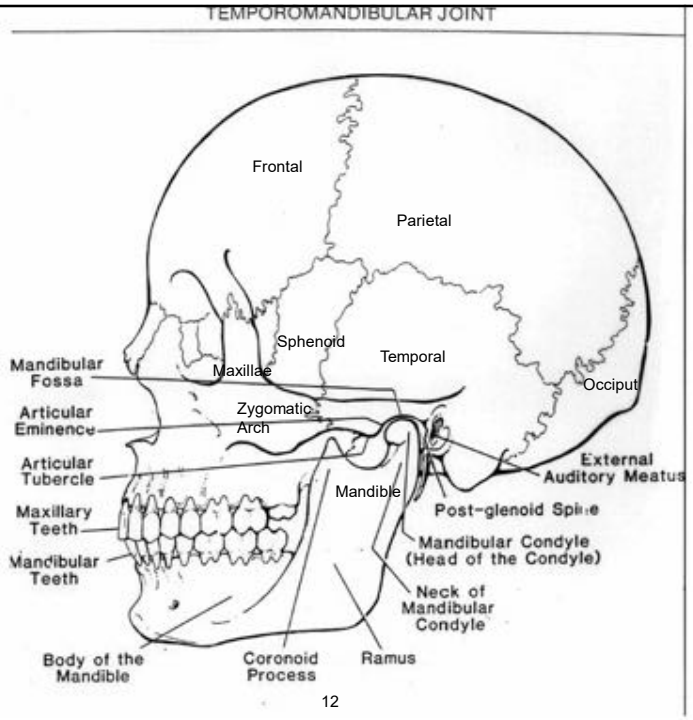

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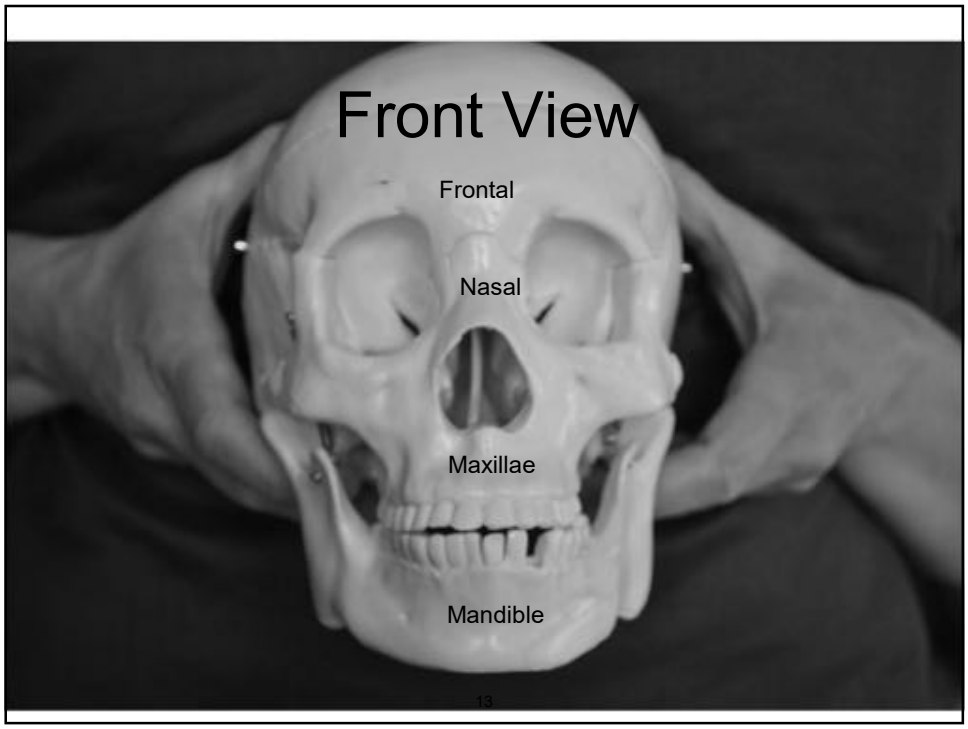
Front View
Frontal
Nasal
Maxillae
Mandible
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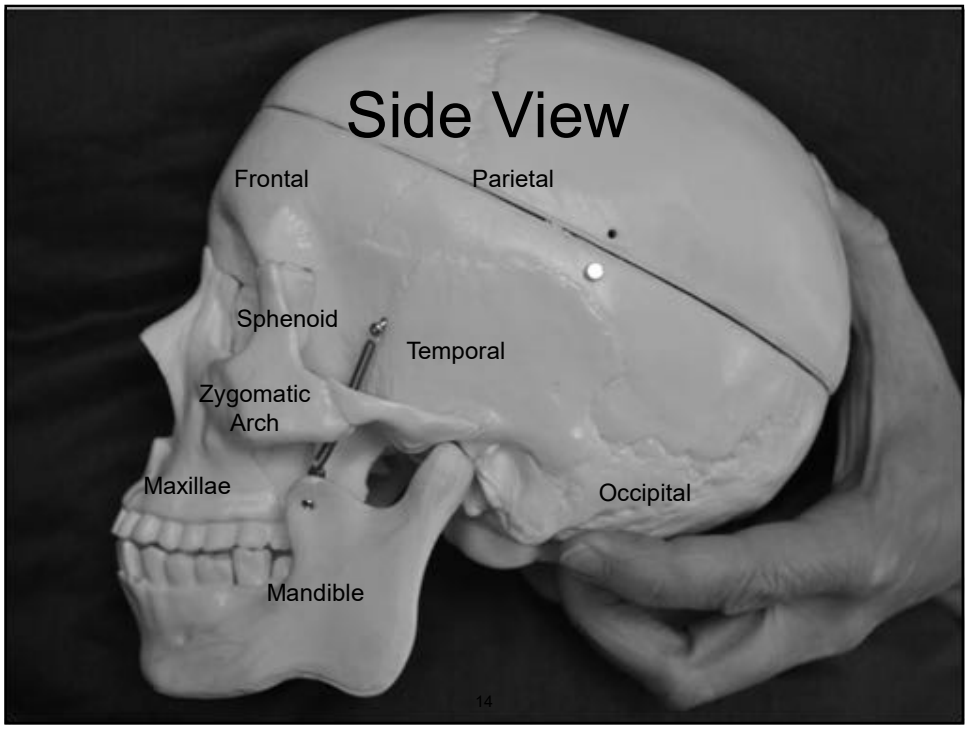
Side View
Frontal
Parietal
Sphenoid
Temporal
Zygomatic Arch
Maxillae
Occipital
Mandible
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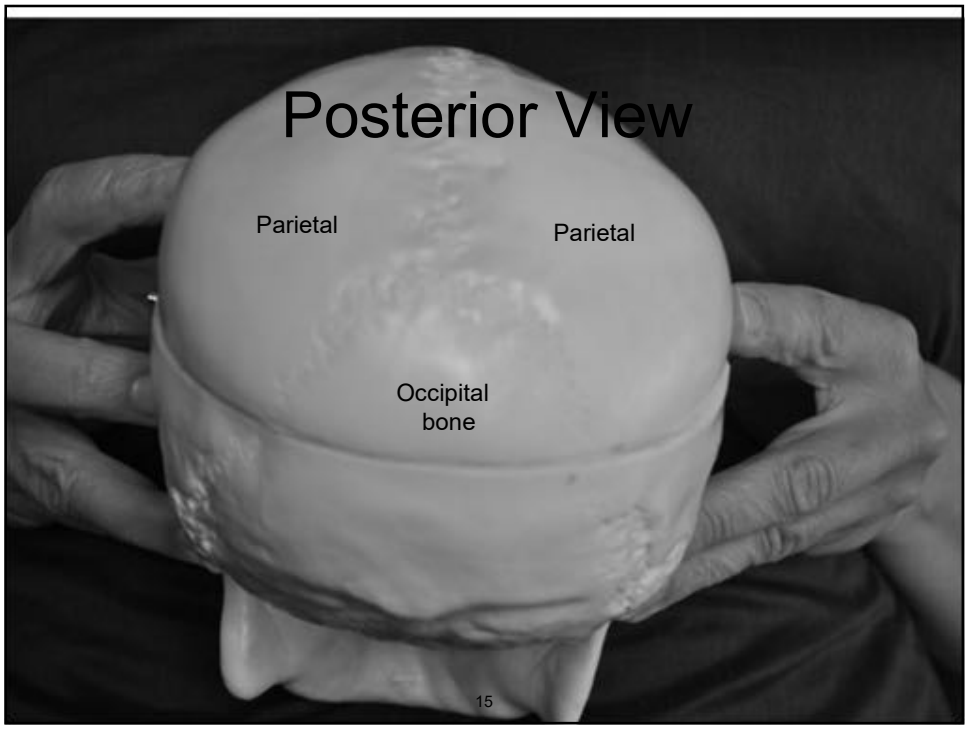
Posterior View
Parietal
Parietal
Occipital bone
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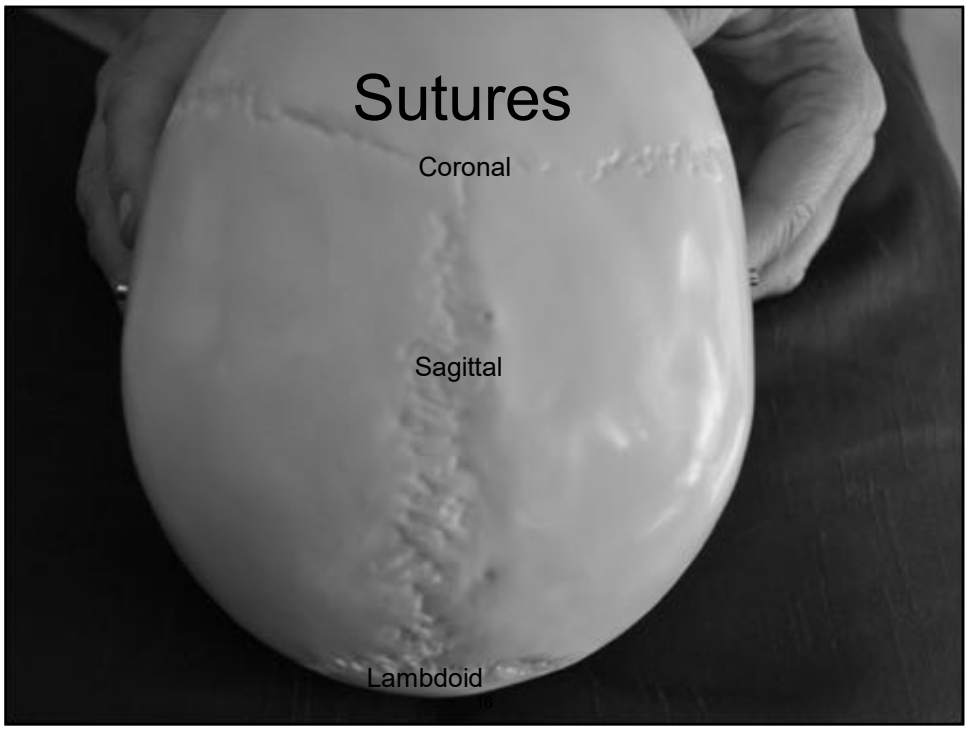
Sutures
Coronal
Sagittal
Lambdoid

Temporomandibular Joint (TMJ)

- Temporal bone
  - Roof of the joint
  - Making the superior joint space
  - Associated with external auditory meatus, parietal bone, occipital bone, sphenoid
- Mandible
  - Gives rise to the condyle
  - Fitting into the fossa of the temporal bone
  - Not directly associated with other cranial bones but related due to muscular and ligament attachments

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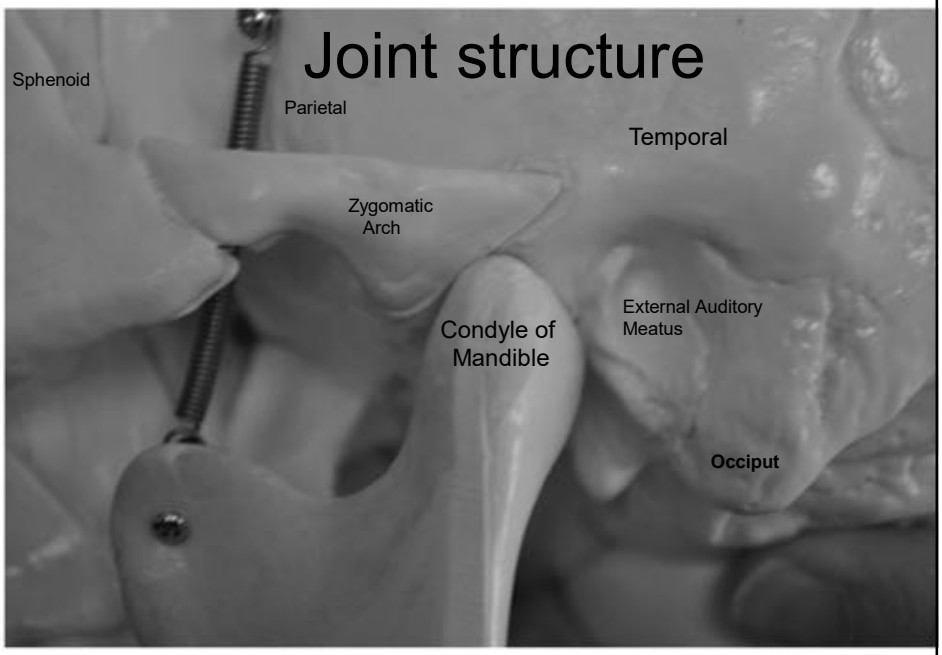

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Joint Characteristics

- Some believe a two joint compartment with upper or superior compartment (allowing for gliding) and lower (where hinge motion occurs)
- Relationship with boney landmarks on skull
  - Coronoid process - anterior to condyle, attachment for temporalis
  - Post glenoid spine - attachment for posterior ligament
  - Articular eminence - subluxing
  - Maxillae - sinus, upper teeth
  - External auditory meatus - ear canal and ear drum

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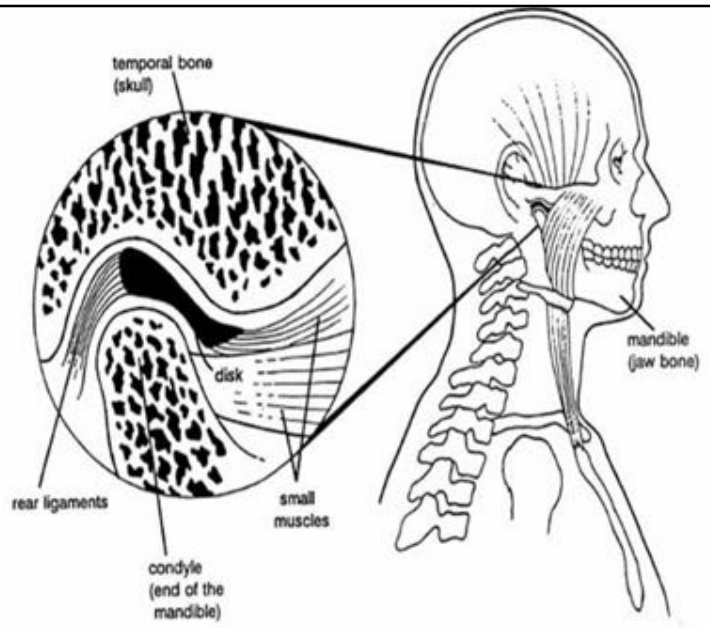

Figure 10. Side view of the craniomandibular system with TMJ insert.

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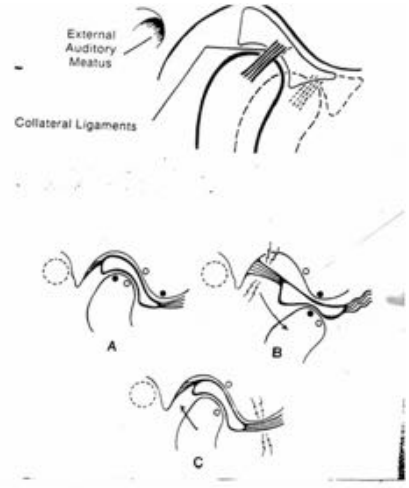
Condyle

- Shape - primarily convex superiorly
- Medial/lateral measurement twice the anterior/posterior
- Not a pure hinge movement with opening
- Rotation with translation forward
- Medial pole - up/forward
- Lateral pole - down/back



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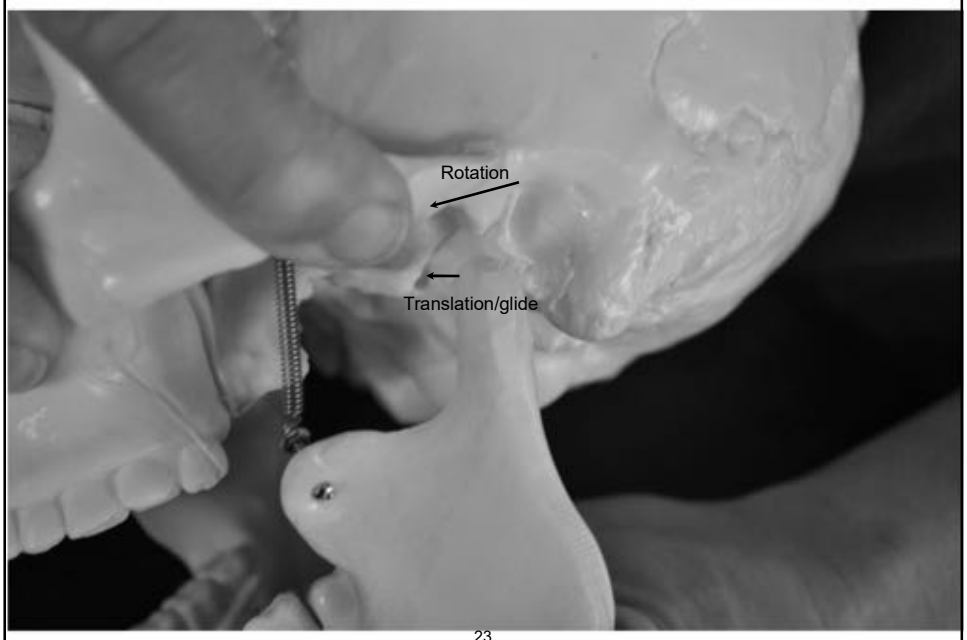

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Attachments

- Collateral ligaments
  - Medial/lateral
  - Stabilizes medial/lateral joint
- Large lateral ligament
  - Temporomandibular ligament
  - Limits depression of condyle (for opening) and posterior movement
- Stylohyoid
  - Limits protrusion
  - A band of fibrous tissue connecting the tip of the styloid process of the temporal bone to the center of the hyoid bone
- Sphenomandibular ligament
  - A flat thin band of fibrous tissue extends downward from the sphenoid bone to the mandible

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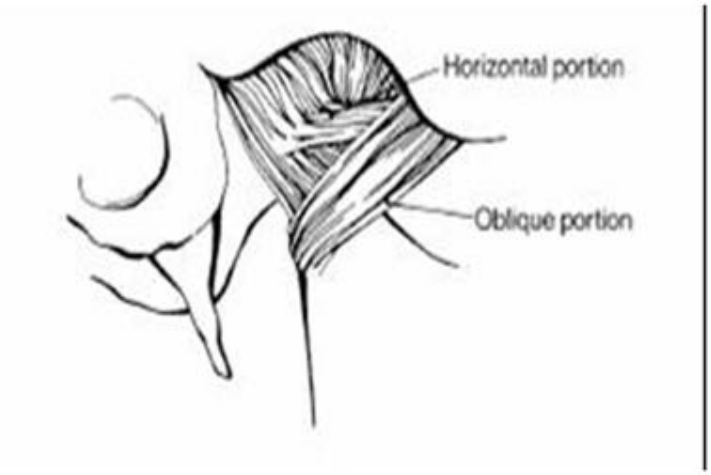
Temporomandibular Ligament (lateral)



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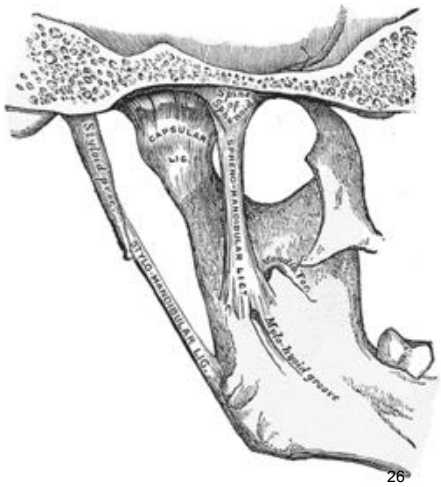
Ligaments



Henry Gray
Anatomy of the Human Body (1918)

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Condyle

- Histologically
  - Covered with dense fibrous connective tissue and fibrocartilage - also on articular eminence and tubercle.
  - Trabecular bone underneath - superficial layer laid down parallel while deeper layer perpendicular

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Weight Bearing Joint

- Withstands shearing forces better
- Each condyle withstands 62.3 kg (monkey research) - other research 597 N in women and 847 N in men.
- Arthritis
- Joint affected by action of both TMJs
  - Balancing side or non-working often has more force on it than working side
  - Chew on diseased/sore side

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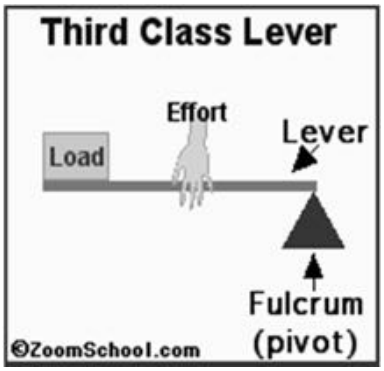
Third Class Lever

- Weight bearing joint - Class III lever
- Example - tweezer



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Research

- Dynamic structure - unilateral chewing or removal of teeth changed the content of glycosaminoglycans in the condyle and disc and caused thickening/hypertrophic layer on condylar cartilage
- Unilateral chewing - ipsilateral side moves shorter distance than contralateral side so ipsilateral side less loaded

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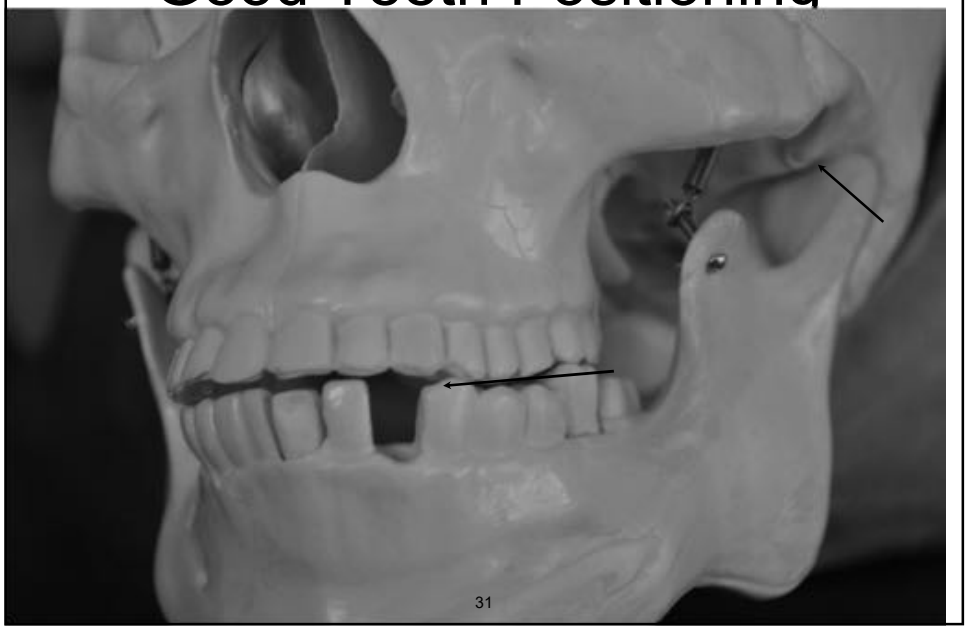
Good Teeth Positioning



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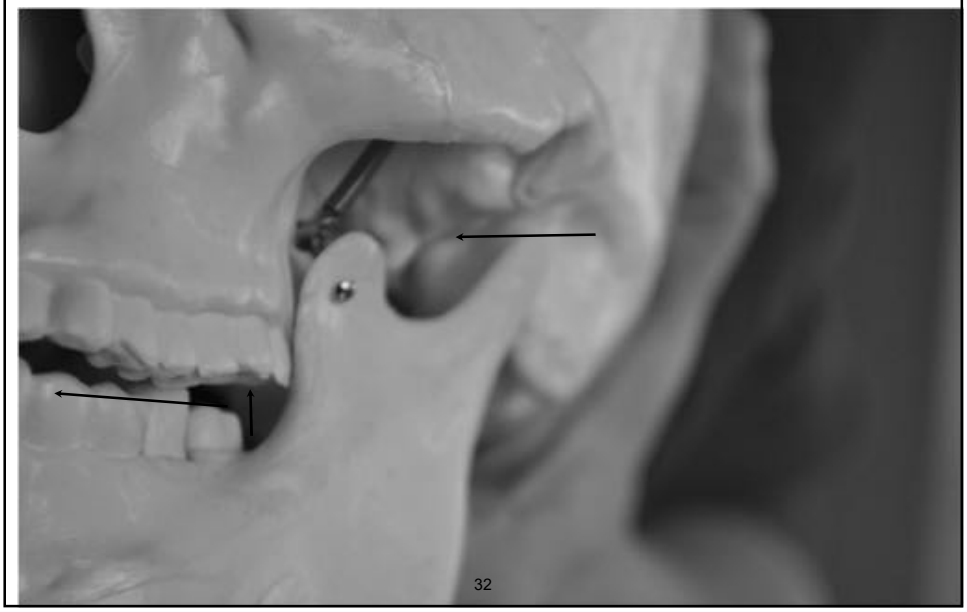
Poor Teeth Positioning



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Disc

•Fibrocartilagenous material which is pliable and able to support, protect and lubricate the articulating bones

•Anterior attachment to capsule and lateral pterygoid muscle.

•Some believe posterior disc is separated by a fat pad into two parts - superior part being elastic with inferior part attaching to mandibular neck and being non-elastic

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Disc

Characteristics

- Bow-tie
- Posterior portion – thickest
- Intermediate portion
  - Always in contact with condyle
  - Thinnest
  - Avascular
  - Aneural

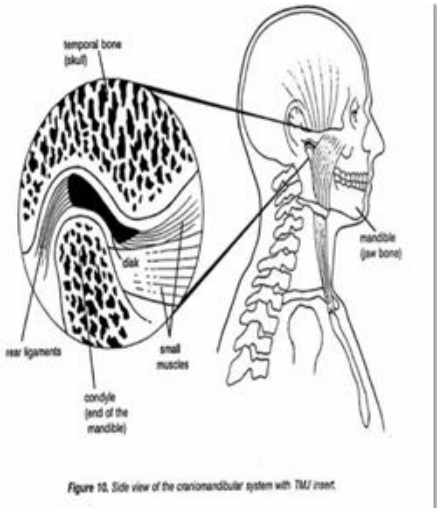

Figure 10. Side view of the craniomandibular system with TMJ inset.

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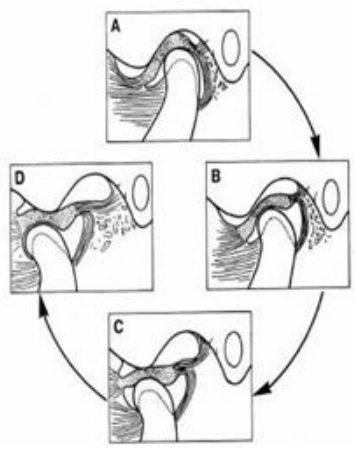
Normal Disc movement-Left Joint

- Moves as a 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



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Disc Dynamics

- More pliable with dynamic loading (chewing) versus static loading (clenching) due to fluid flow in and out of disc.
- Fluid flow for nutrition - especially avascular intermediate portion
- Fluid flow to help eliminate waste products.

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Retrodiscal Tissue

- High capacity for energy dissipation during stress of joint
- Little to no function to pull disc backward with closing
- Pain sensitive structure - highly vascular and innervated - inflammation

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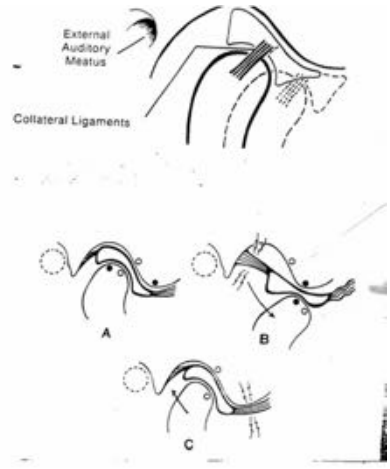
Disc Attachments

Attachments:
- Posterior ligament
  - Connects disc to posterior glenoid spine so attachment to posterior skull
  - Elastic
  - Passive-tension tissue



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Other Disc Attachments

- Lateral pterygoid - superior fibers - to superior/anterior portion
- Collaterals - disc to condyle
- Capsule - anterior/posterior only
- Does not attach to condyle directly

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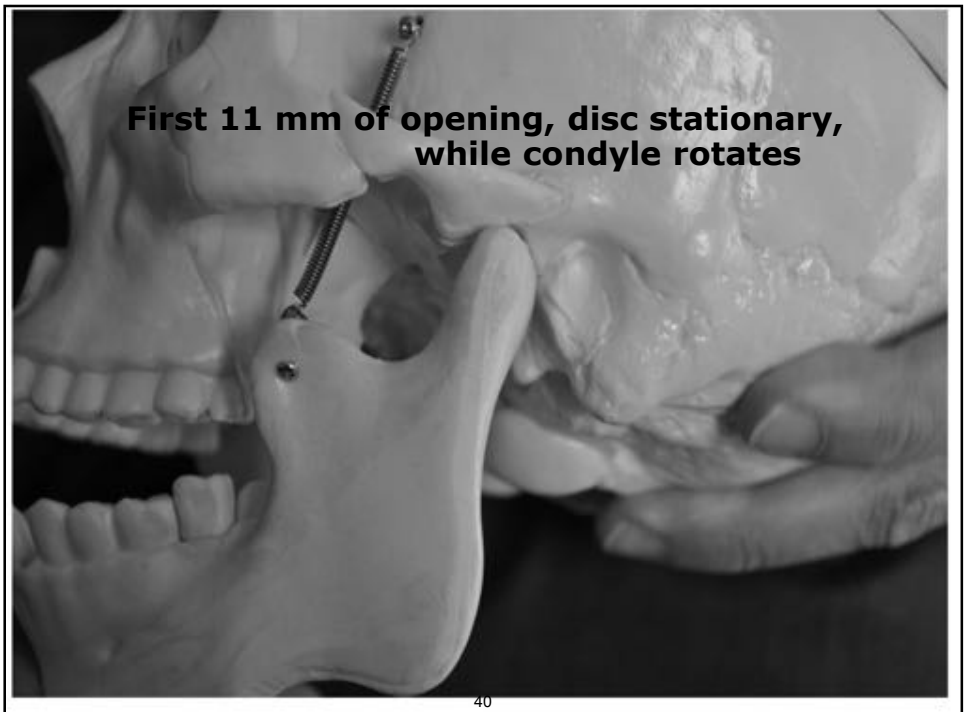

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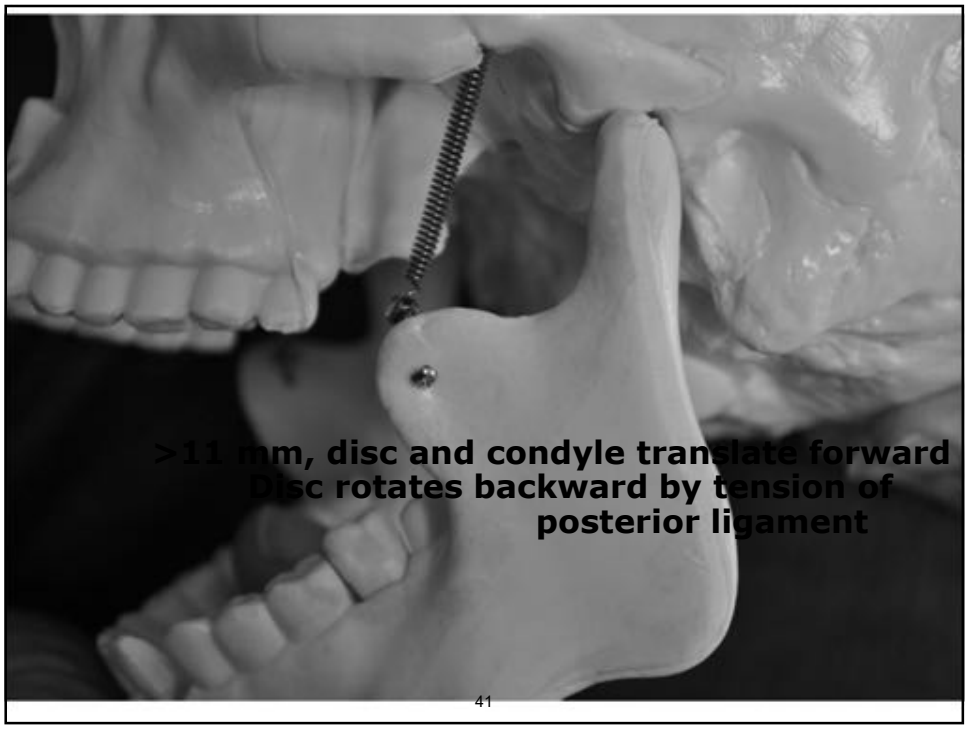

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Capsule

- Highly vascular and innervated
- Fibers run temporal to mandible
- Strongest fibers lateral/inferior
- Less fibers superior/lateral medial - question if this instability contributes to anterior dislocation of disc

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Capsule

- Synovial membrane
  - Produces synovial fluid - small amounts of a clear, straw-colored viscous fluid. It is an infiltrate of the blood diffused out from the capillary network of the synovial membrane.
  - Lubrication and metabolic exchange for avascular joint tissue (disc)
- Temporomandibular ligament

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Innervation

- Cranial Nerve V (trigeminal)
  - Mandibular branch - made up of posterior deep temporal, masseteric, and auriculotemporal nerves
  - Innervates temporalis, masseter, medial, lateral pterygoid, digastric, mylohyoid, tensor tympani, tensor veli palatini muscles
  - Both sensory and motor
  - Travels through foramen rotundum and ovale

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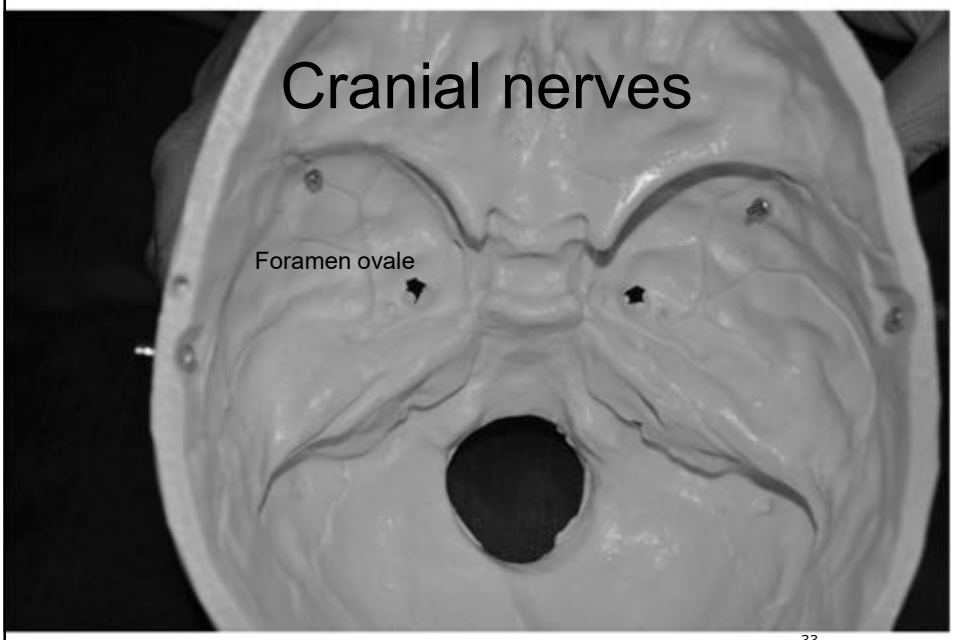

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Innervation

- Pain fibers - Type IV (from auriculotemporal branch)
- Mechanoreceptors I, II, III in nerve endings
  - Postural and kinesthetic perception, reflexive activity and inhibition of pain
  - May act abnormally with response to dysfunction (swelling, capsule tightness, condyle positioning) - causing abnormal muscle firing

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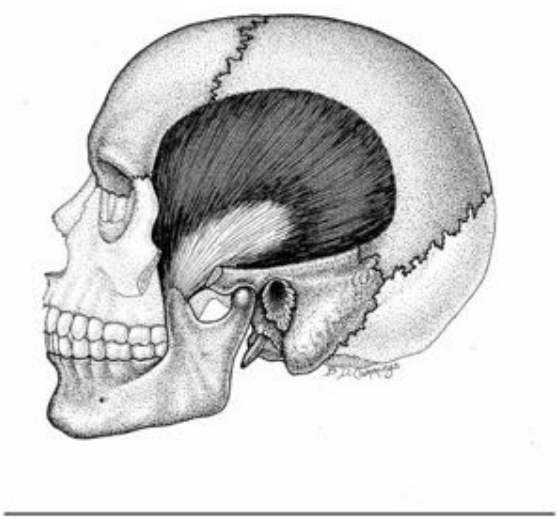
Muscles-Temporalis

- Origin - temporal fossa, superior to zygomatic arch
- Insertion - coronoid process of mandible
- Anterior, middle, and posterior fibers



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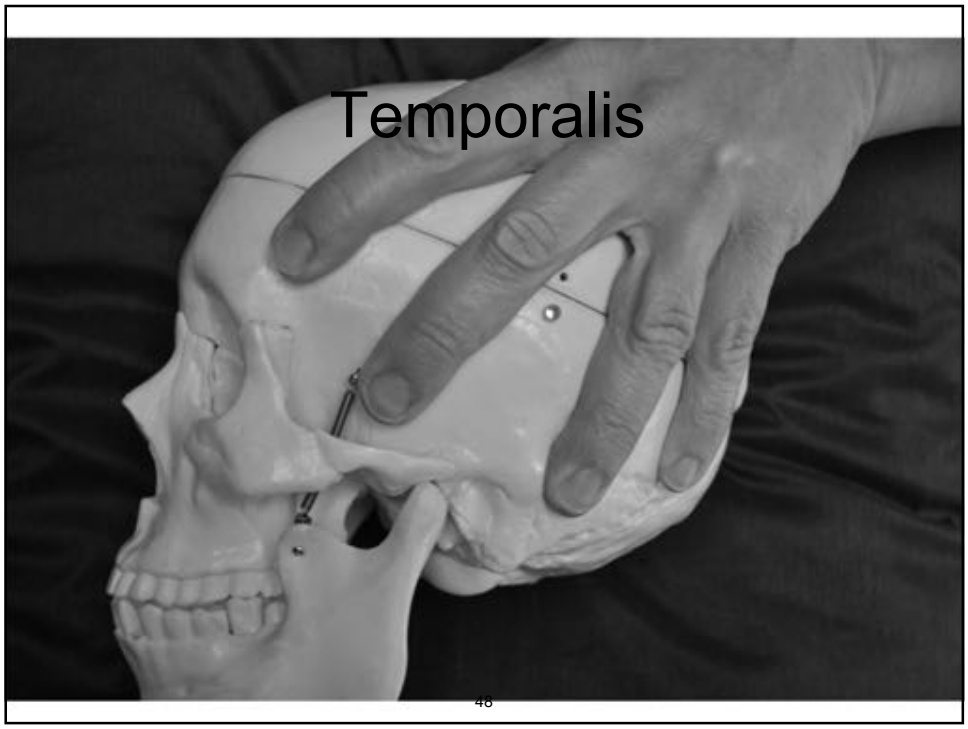

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Temporalis

- Elevation of mandible
- Posterior fibers - retrusion, and deviation to same side
- Postural muscle
- Large muscle 53% of total mass of elevators
- Keeps jaw shut during every day activities

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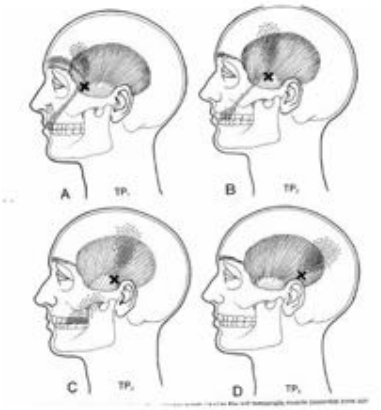
Temporalis

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



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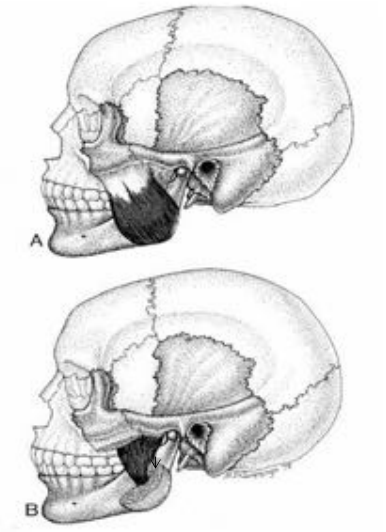
Muscle - Masseter

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



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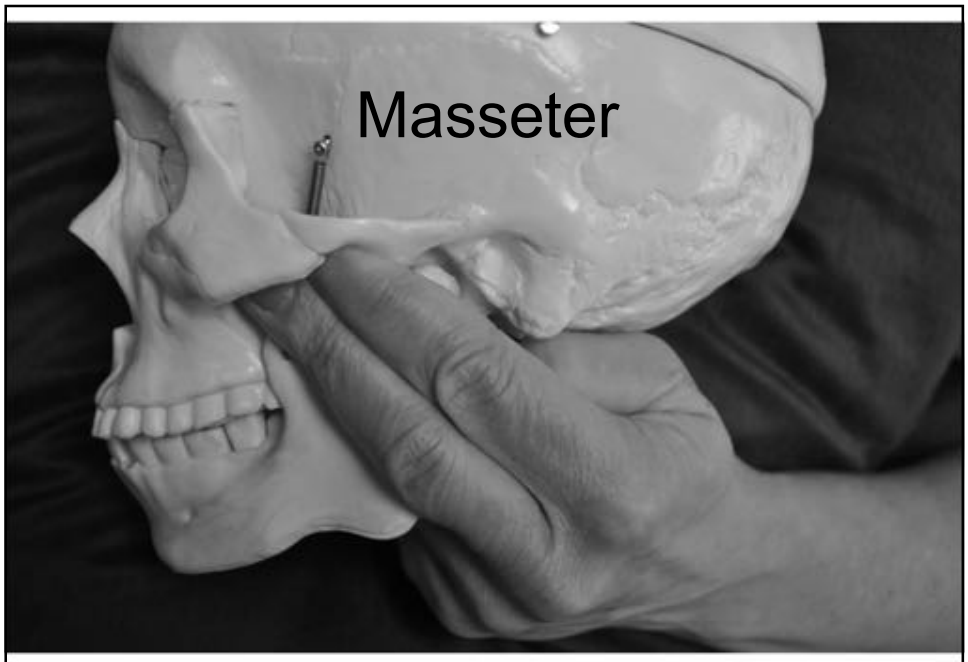

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Masseter

- Synergist with temporalis for elevation but also retrudes jaw, lateral deviation to same side
- Chewing - first muscle to activate - especially with front teeth

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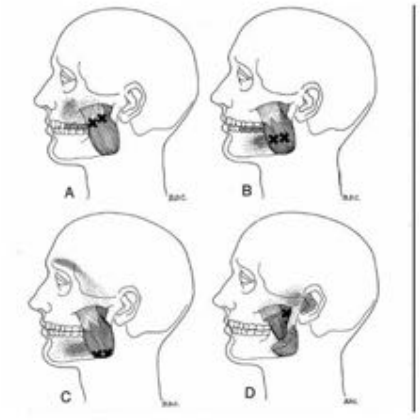
Masseter

- Referral pattern - lower jaw, molar teeth and gum, maxilla, lower portion of mandible, temple, eyebrow and to ear
- “Sinusitis”



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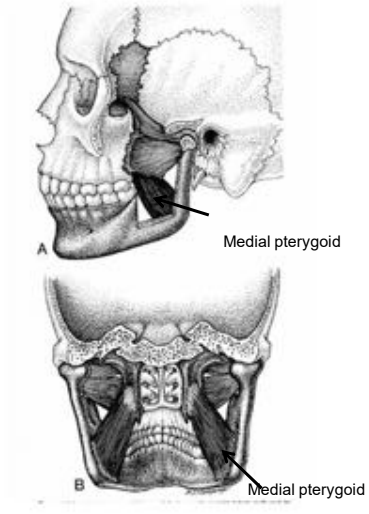
Medial Pterygoid

- Origin - inner surface of lateral pterygoid plate (under lateral pterygoid)
- Insertion - ramus of mandible by the angle



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Medial Pterygoid

- Elevation, protrusion and lateral deviation to opposite side
- Close relationship with lateral pterygoid

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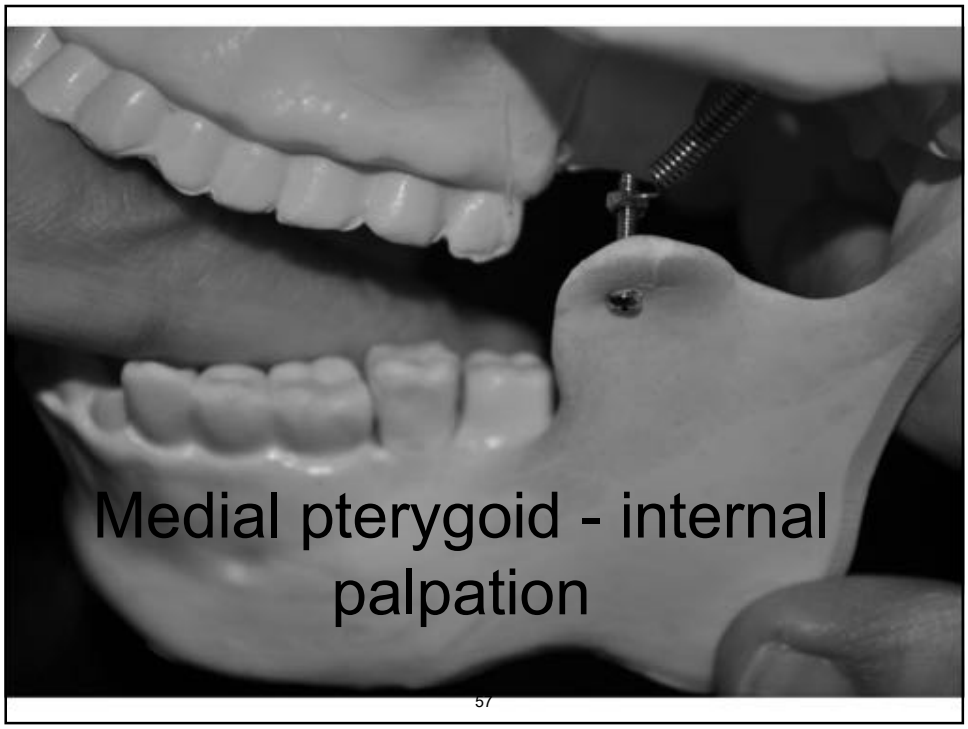
Medial pterygoid - internal palpation

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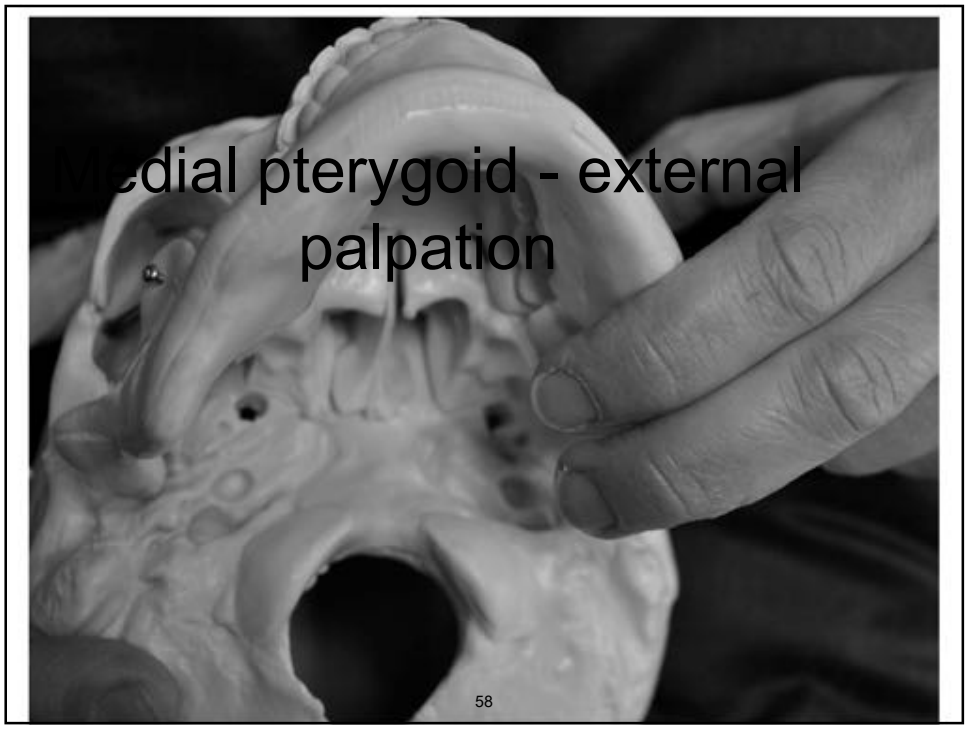
Medial pterygoid - external palpation

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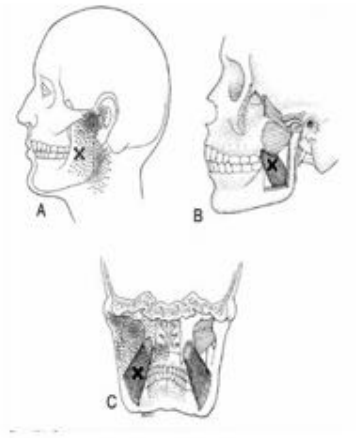
Medial Pterygoid

- 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



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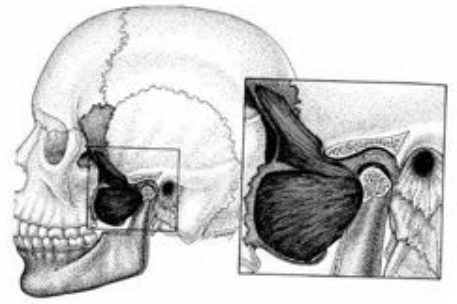
Muscles - Lateral Pterygoid

- Origin - lateral pterygoid plate of sphenoid
- Insertion - condylar neck, ramus of mandible and disc



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Lateral Pterygoid

- Elevation, protrusion, lateral deviation to opposite side (also initial opening)

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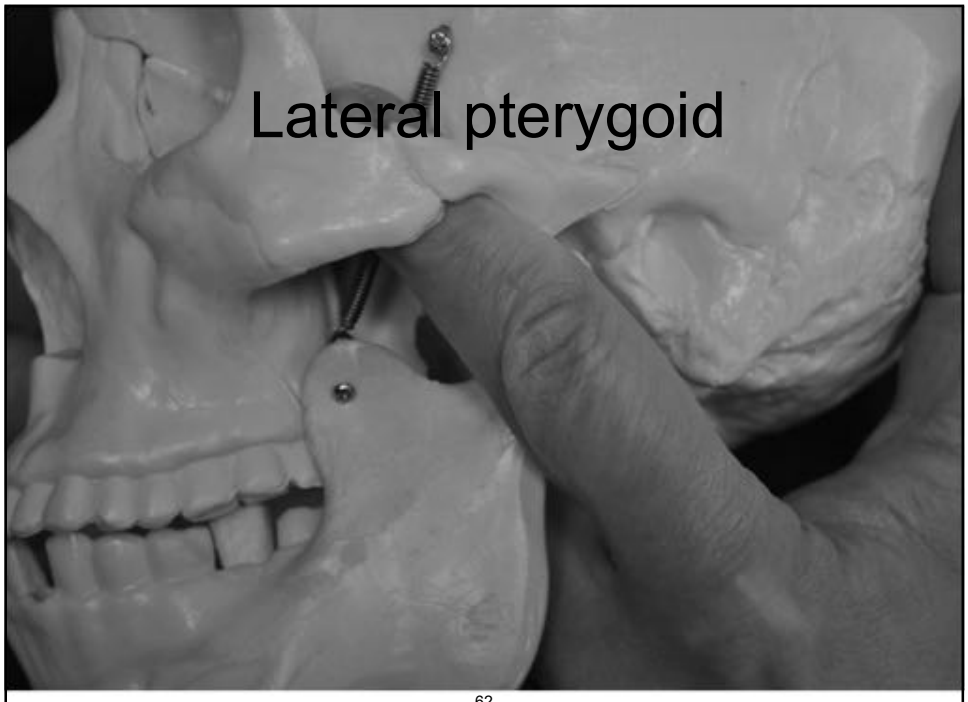

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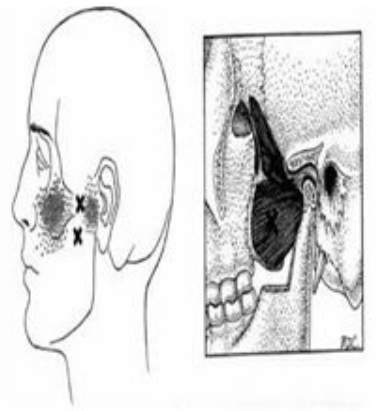
Lateral Pterygoid

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



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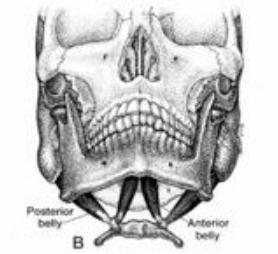
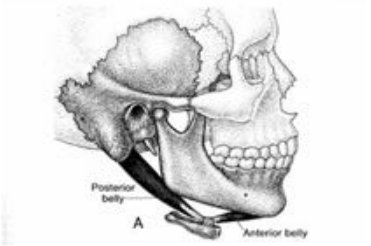
Muscles - Digastric

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





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Digastrics

- Depression and retrusion of jaw
- Less forceful movement - assisted with long lever arm and gravity
- Active with swallowing and coughing

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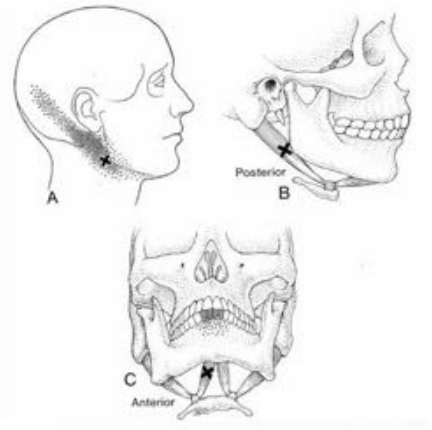
Digastrics

- Referral pattern - behind mandible towards back or ear; lower incisors
- Rarely in spasm due to forward head posture (stretch weakness - Kendall)



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Overview of Jaw Muscle Action

- Elevation - temporalis, masseter, medial pterygoid, superior division of lateral pterygoid
- Depression - digastric, mylohyoid, geniohyoid, and inferior portion of lateral pterygoid (initiates movement)
- Lateral deviation - ipsilateral posterior temporalis, contralateral medial pterygoid and inferior portion of the lateral pterygoid
- Protraction - medial pterygoid, suprahyoid, inferior portion of lateral pterygoid
- Retraction - posterior and middle temporalis, digastric and masseters

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Cervical Spine/Muscles

- Form stable base for TMJ to work on
- Upper cervical relationship
- Poor posture - condyle rotates backward - change of biomechanics
- Referral pattern from cervical spine
- Increased jaw muscle pain correlated with increased neck muscle pain

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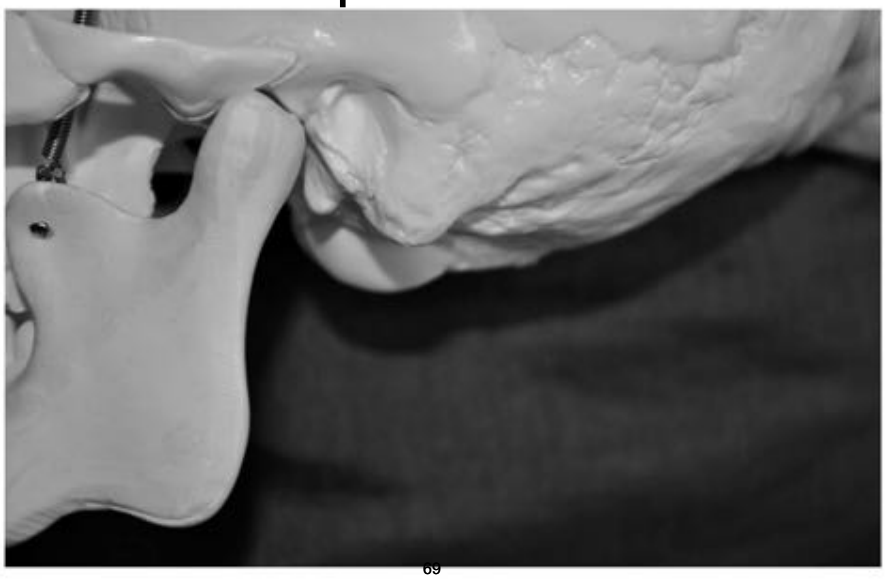
Relationship to Cervical Area



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Thesis -Masticatory Muscle Activity with Varying Head Postures

- Purpose: Compare the muscle activity of bilateral temporalis and masseters (masticatory muscles) with head in natural, forward and retracted postures, with chewing.
- Results: Did show a difference in masticatory muscle activity of the TMJ in varying head postures. More activity was seen in forward and retracted head postures when compared to natural head postures in asymptomatic females. However, differences were not statistically significant.

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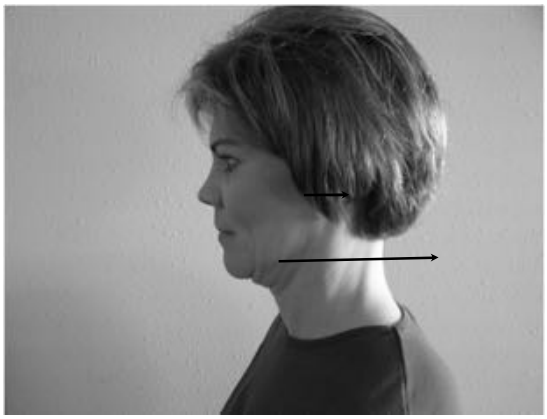
Posture and TMJ Position

Chin retraction could cause TMJ posterior positioning, changing the biomechanics of the joint.



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Disorders of the Jaw

- Muscle disorders - myofascial pain dysfunction (MPD)
  - Myositis, muscle spasm, muscle contracture, myofascial pain (referred muscle pain), myalgia
  - Most common disorder
- Disc disorders
  - Internal derangement

Disorders of the Jaw

- Joint/bone
  - Subluxation
  - Arthritis
- Capsule
  - Capsulitis

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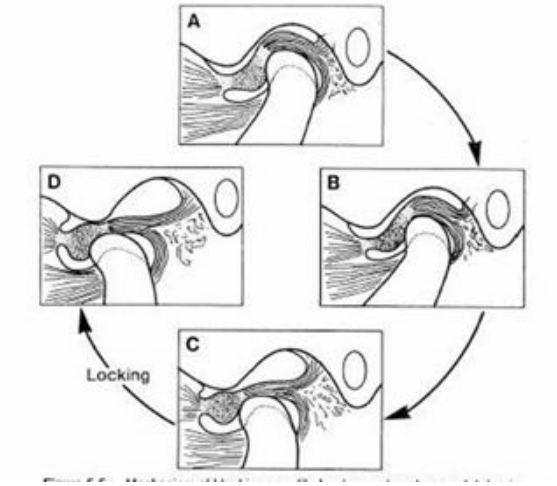
Myofascial Pain Dysfunction Characteristics

- Less objective findings than intra-articular disorders
- Could have decreased opening
- Muscle pain aggravated by jaw function or parafunction
- Headaches
- Tenderness of muscles without mechanical symptoms
- Caused by an underlying related disorder - malocclusion, arthritis, internal derangement
- Often chronic and cyclical

Disc Disorder
Internal Derangement

- Opening - disc displaced anteriorly-condyle in contact with posterior portion of disc - bow tie - need to “click” over it
- Closing - opposite needs to happen, so “reciprocal click” (or disc displacement with reduction) happens
- Progressive

Internal Derangement



Internal Derangement - Signs and Symptoms

- Click, pop, lock - not usually due to muscle incoordination
- Pain at joint - click is microtrauma to joint
- Decreased opening
- Change of biomechanics of condyle translates first to “catch” the disc then rotates
- S shaped opening/closing to reposition the jaw
- More common in prone sleepers

Internal Derangement - Classification

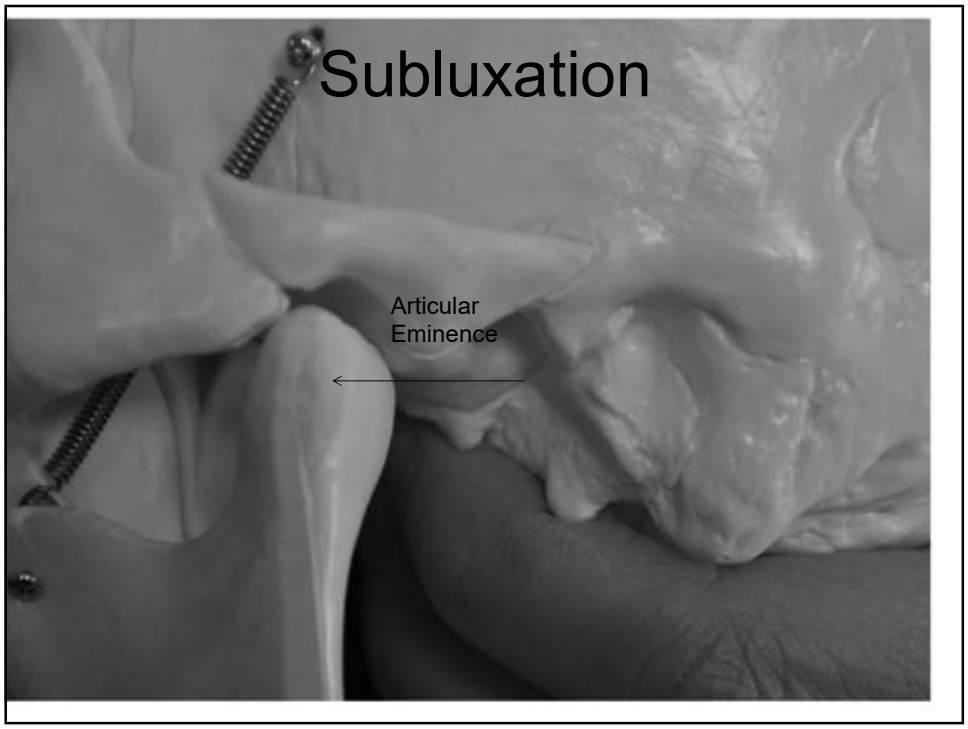
- Dentist
  - Class I - initial stage when click in closed position
  - Class II - when translation occurs with opening
  - Class III - interference with translation

Internal Derangement - Classification

- Rocabado
  - Phase I - click in first 10 mm of opening - disc subluxed medially
  - Phase II - click in 10-20 mm of opening - disc moved anteriorly as well as medially
  - Phase III - 20-30 mm of opening - unstable joint – hypomobility - restriction in opening - disc entirely subluxed anteriorly and impedes translation of condyle
  - Phase IV - no noise - closed lock position - intermittent or permanent

Joint/Bone Disorder Subluxation

- Click at full opening - condyle translates onto the articular tubercle and then back to articular eminence.
- Excess opening (>40 mm)
- One click - when closing
- Could be caused by faulty muscular dynamics to hold condyle in place
- Most common population - young women ages 13-21



Joint/Bone Disorder
Arthritis

- Weight bearing joint
  - Each condyle withstand 62.3 kg
  - Joint affected by action of both TMJs
    - Balancing side or non-working often has more force on it than working side
    - Chew on diseased/sore side

Aging

- Flattened condyle
- Osteoporosis of the condyle bone
- Thickening of the fibrous covering of the condyle
- Thinning of the cartilagenous zone of condyle
- Thinning of the disc
- Fibrotic synovial folds
- Thickening of the blood vessel walls
- Decrease the number of nerves
- Decrease in the synovial fluid formation
- Decrease in the disc and capsule extensibility
- Decrease the resilience during mastication due to cartilage changes into collagenous elements

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Joint/Bone Disorder Arthritis

- Advanced disease - past history of clicking, no sound (closed lock)
- Caused by
  - Disc disorder
  - Parafunctions (clenching/bruxing, biting objects, chewing gum, mouth breathing, leaning on chin) - chewing only should be 15-20 minutes/day
  - Muscle hyperactivity
  - Malocclusions - loss of posterior teeth

Arthritis-Signs and Symptoms

- Crepitus
- Unilateral disease
- Palpable tenderness of condyle
- Possible referred pain to head or neck
- Pain increases as day progress'
- Decreased opening
- Chew on affected side

Capsule/Capsulitis

- Biochemical and biomechanical changes
- Immobilization from surgery, surgery itself or trauma
- Often associated with disc disorders
  - Anterior/medial disc displacement can cause adhesive capsulitis
  - Capsule alignment changes

Other

- Growth abnormalties
- Rheumatoid arthritis
- Ankylosis

Intervention/Dentist

- Assess teeth positioning (occlusion)
  - Parafunctions of clenching/bruxing
  - Malocclusions - no longer do occlusive adjustments - one study found no evidence of benefit for treatment
  - Pressure on back teeth activates temporalis and superior head of lateral pterygoid, anterior teeth activate masseters

Dentist

- Construct oral appliance
- Bite plate, night guard, flat plane splint
  - Allows mandible to slide without interference of teeth
  - Inhibits muscle activity - proprioceptive input, stretch muscle or provide ideal occlusal scheme
  - Restore occlusal vertical dimension
  - Realign the maxillo-mandibular relationship or condyle position
  - Cognitive awareness

Orthopedic Splints

- Clicking or degenerative disc
- Repositioning or pivot splints that relieve pressure off of the joint surfaces

Intervention/Psychologist

- Clenching/bruxing as a stress response
  - Relaxation training, behavior modification, biofeedback techniques
  - Counseling

Physical Therapy Evaluation

- Subjective
  - History - including arthritis (osteoarthritis, rheumatoid)
  - Motor vehicle accidents (MVA)
  - Chief complaint (quality, location, intensity, frequency, course in 24 hours)
  - Medication

Subjective

- X-rays
- Occupation
- Pain scale and pain diagram
- Parafunctional behaviors
  - Gum chewing
  - Clenching/bruxing
  - Leaning on chin
  - Biting nails, pencils, cheek
  - Sleep position
  - Caffeine use
  - Musical instruments

Subjective

- Symptoms of the head
  - Headaches
  - Pain in teeth, palate, or tongue
  - Pain in neck
  - Pain radiating to shoulder, back or neck
  - “Neuralgia” of upper maxilla, mandible, or neck
  - History of migraines
  - History of sinus treatment

Subjective

- Symptoms of the ears
  - Vertigo, tinnitus, hearing loss - increase statistically with myofascial pain dysfunction and internal derangement; or combination of both
  - Pain in or around the ear – "stuffiness"
  - Hypoacousia or hyperacousia
  - History of Meniere syndrome or ear surgery

Subjective

- Symptoms of the eyes
  - Pain in or around the eyes - infraorbit or supraorbit
  - Pressure behind the eyes
  - Burning sensation of the eyes
  - Blurred vision

Objective

- Observation
  - Posture
  - Facial symmetry
- Respiration
  - Diaphragmatic/chest
  - Nose/mouth
- Tongue position at rest
- Swallowing
- Occlusal screen
  - Past dental history
  - Overbite and overjet

Objective

- Mandibular movement/active range of motion(AROM)/passive
- Capsular pattern
  - Deviation toward involved side with decreased ROM with straight opening
  - Deviation toward involved side with protrusion
  - Decreased lateral movement to uninvolved side
- TMJ arthrokinematics
  - Distraction
  - Lateral/medial joint play

Objective

- Palpation-muscles

Extraorally
- Temporalis
- Masseters
- Medial pterygoid
- Digastrics
- Hyoid mobility

Intraorally
- Temporalis insertion
- Masseter
- Lateral pterygoid
- Medial pterygoid

Objective

- TMJ palpation
  - Tenderness - externally and capsule (through auditory meatus)
  - Crepitation
  - Movement - rotation and glide - symmetry
  - Opening click/closing click - stage

Objective

- Provocation tests
  - Weight bearing
  - Clench

Mandibular Movement

- Mandibular movement
  - Maximum opening (incisor to incisor) - norm 40 mm - rotation and translation of condyle
  - Protrusion/retraction - norm-6-10 mm - just translation of condyle
  - Lateral deviations - norm is 10 mm - look for symmetry - rotation of ipsilateral condyle with translation of contralateral condyle

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Mandibular Opening

Mandibular Movement

- Maximum opening (incisor to incisor) - norm 40 mm
  - Pain free opening
  - Passive stretch
    - Scissor stretch - movement=muscle tightness; no movement=disc interference
  - Deviation on opening
    - S curve - internal derangement
    - C curve - capsular pattern or muscle involvement

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Protrusion/retraction

Norm 6-10mm

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Lateral Deviation

Norm 10 mm - but look for symmetry side to side

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Joint Assessment Distraction

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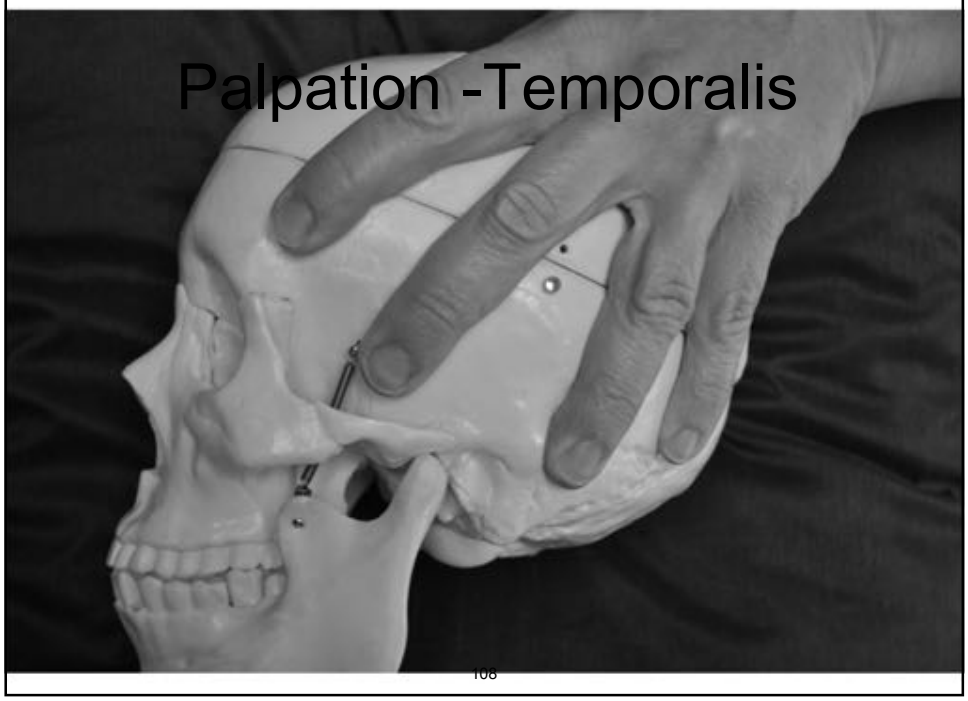
Palpation -Temporalis



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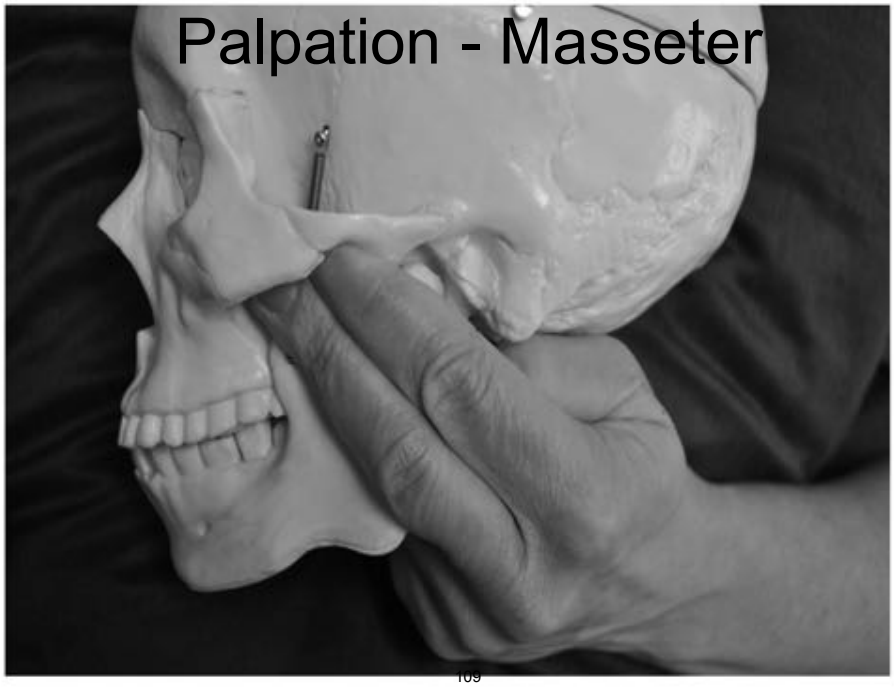
Palpation - Masseter



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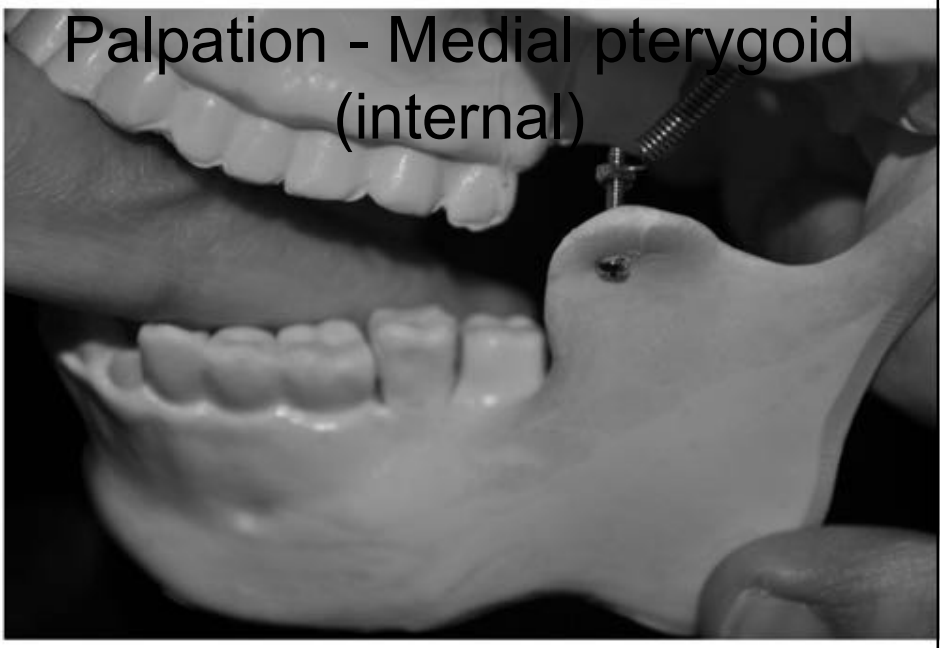
Palpation - Medial pterygoid (internal)



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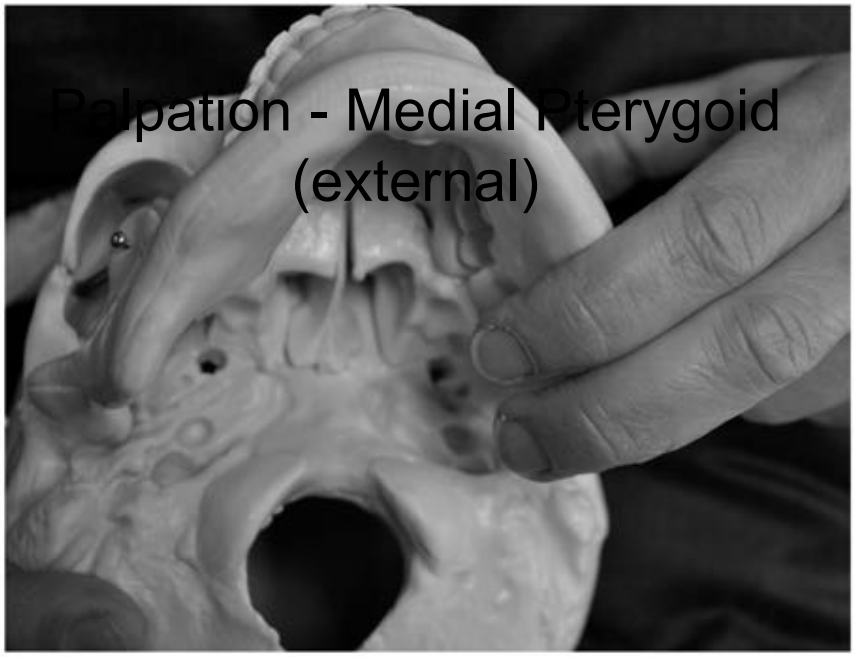
Palpation - Medial Pterygoid (external)



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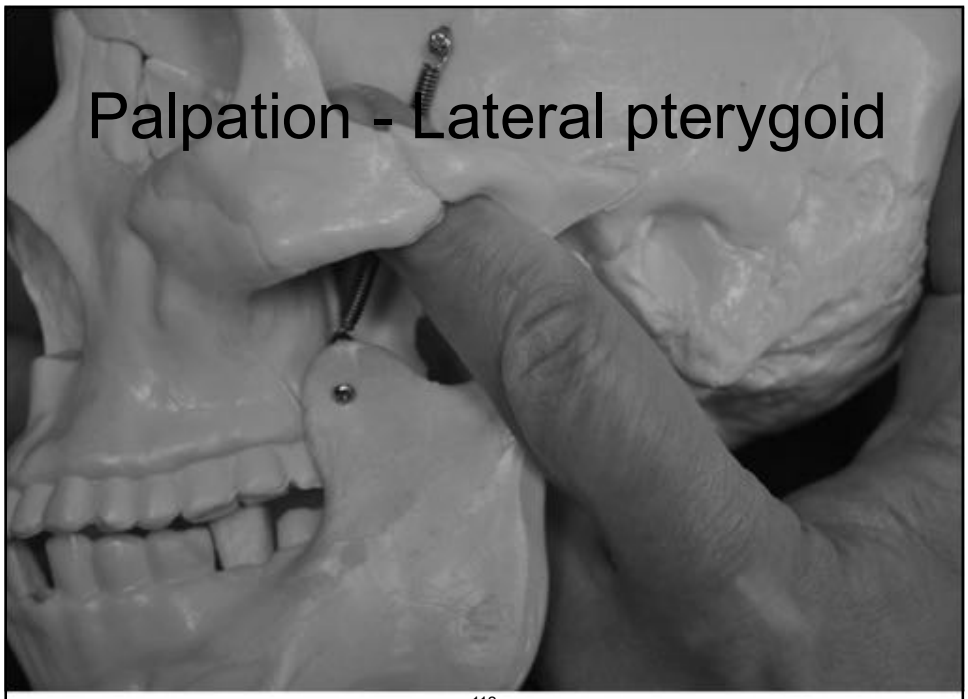
Palpation - Lateral pterygoid



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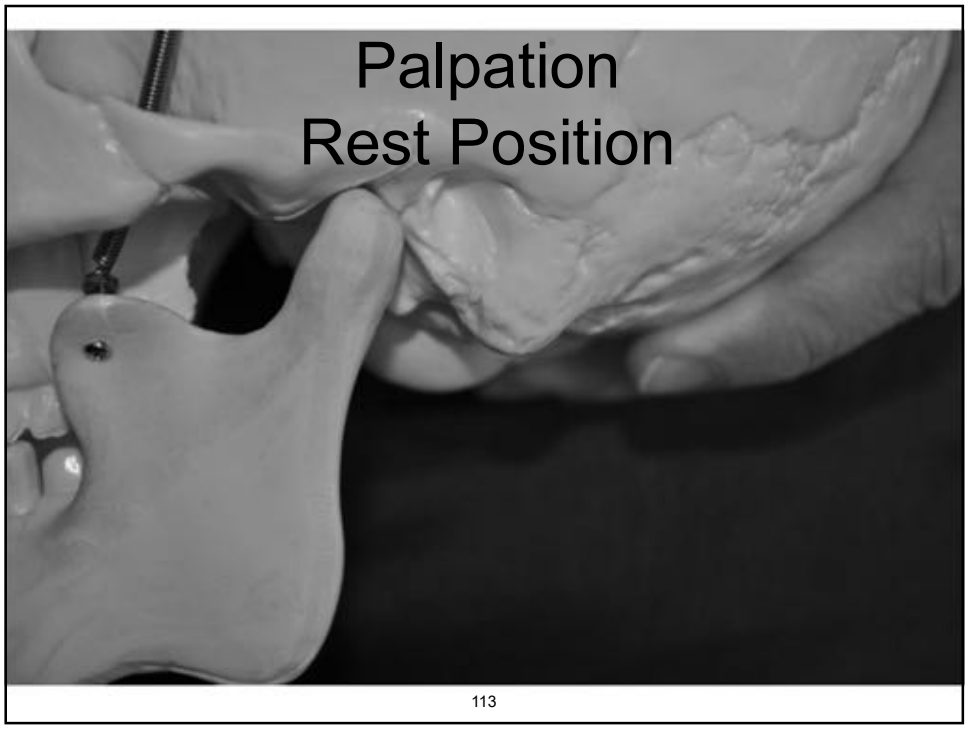

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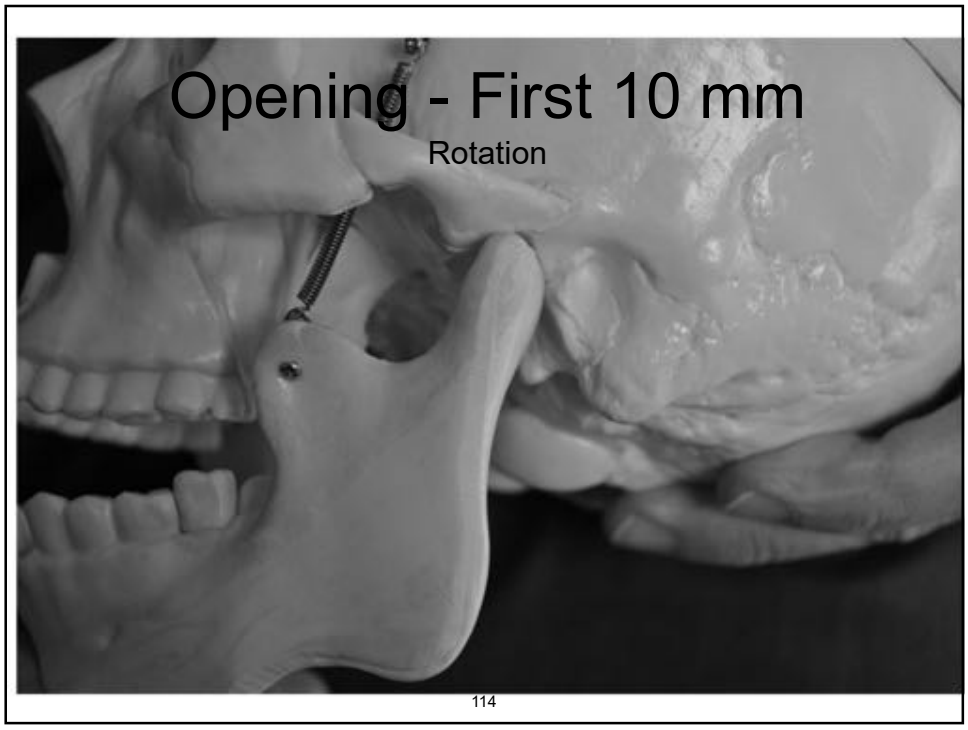

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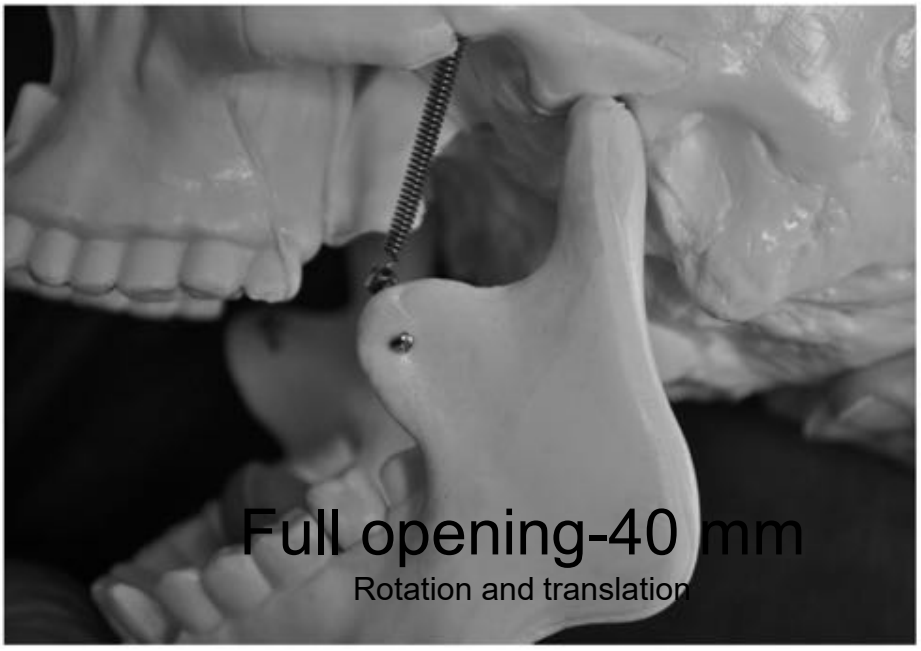

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Normal Opening and Symmetry

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Provocation Tests

- Weight bearing - loading joint for internal derangement
  - Opening
  - Deviation
  - Protrusion

Weight Bearing Test

Hand positioning

Clench Test

- Pain on same side - muscle
- Pain on opposite side - joint

Objective/Cervical

- Upper cervical joint hypomobility
- Cervical muscle tension
  - Upper trapezius
  - Scalenes
  - Sternocleidomastoid

Craniosacral Therapy

- Objective - assess cranial bone mobility
- Treatment - light touch applied by a therapist to the craniosacral system, which consists of tough waterproof membrane (the dura mater) which envelops the brain and spinal cord. An important function of this system is the production, circulation, and reabsorption of cerebrospinal fluid. This fluid is produced within the craniosacral system and maintains the physiological environment in which your brain and nervous system develop, live and function. This therapy uses myofascial release techniques to various areas of fascia (connective tissue that overlies the muscles) and light touch applied to the cranial bones in order to influence the dura mater attached to them and therefore, influence the cerebrospinal fluid. (From Upledger Institute)

Assessment

- Myofascial Pain Dysfunction (MPD)
  - Habitual patterns
  - Referred patterns
  - Provocation test
  - AROM - stretch opening
  - Palpation
- Internal Derangement
  - History of trauma and clicking
  - Present clicking behavior
  - Provocation test
  - Joint play

Assessment

- Capsular involvement
  - Palpation of capsule
  - Capsular pattern
- Bone/Joint - subluxation
  - Passive mobility/joint play
  - History
- Combination
- Referred from cervical area

Intervention/Physical Therapist

- Manual techniques
  - Mobilization
  - Myofascial release
  - Craniosacral therapy
- Cervical area

Intervention/Physical Therapy

- Modalities
  - Heat/cold
  - Electrical stimulation - including iontophoresis
  - Ultrasound - **not with proplast implant**
  - Not cervical traction - over-the-door

Intervention/Physical Therapist

- Home exercise program
  - Range of motion
  - Strengthening/stabilization
  - Postural exercises
  - Joint protection techniques/lifestyle changes

Treatment/Myofascial Pain Dysfunction (MPD)

- Modalities -
  - Ultrasound - 1.0 watts/cm 2-5 minutes to joint or muscle
  - Heat
  - Electrical stimulation - microcurrent
- Manual therapy - joint mobilization, craniosacral therapy, myofascial release - including to upper cervical region

Treatment/Myofascial Pain Dysfunction (MPD)

- Home exercise program/life style changes
- Tongue positioning
- Self-joint distraction
- Self myofascial release
- Eliminating parafunctional behavior
- Postural instruction
- Conjunction with splint therapy
- Conjunction with biofeedback and counseling

Treatment/Internal Derangement

- Modalities
  - Iontophoresis-dexamethasone
  - Electrical stimulation
  - Cold-ice massage
- Manual techniques
  - Joint distraction
  - Craniosacral therapy
- Joint protection techniques
  - Limit motion to no noise
  - Soft food diet or chewing behaviors
- Home exercise instruction
  - Change parafunctional behavior
  - Self joint distraction techniques
  - Tongue positioning for relaxation

Treatment/Capsule

- Usually a result of another disorder unless post surgery
  - Modalities
    - Iontophoresis
    - Ultrasound-pulsed
    - Cold
  - Manual therapy
    - Joint distraction to stretch and encourage fluid exchange
  - Home exercises
    - Self TMJ distraction
    - Joint protection techniques

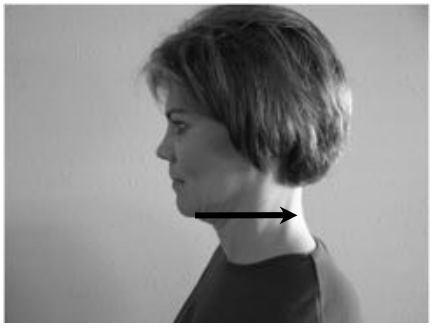
Treatment/Arthritis

- Modalities
  - Iontophoresis
  - Ultrasound - pulsed
  - Cold
- Manual therapy
  - Joint distraction to stretch
  - Home exercises
  - Self TMJ distraction
  - Joint protection techniques

Treatment/Subluxation

- Usually a component of MPD - treat as this
- Add to home exercise program
  - Limited opening - no noise
  - Stabilization exercise

Home Exercise Posture



Home Exercise Controlled Opening

- Place hands on sides of jaw. Feel motion of rotation and then sliding forward as mouth opens.
- Practice opening so motion is even on both sides.
- Do not cause click/noise - limit opening.

Home Exercise
Tongue Positioning

- Put tongue in the "clucking" position - open mouth without making a sound, while keeping tongue sucked up to the roof of your mouth - do not push tongue against top front teeth.
- 10 x-hourly to decrease clenching and relax jaw muscles

Home Exercise
Distraction/External

Home Exercise Distraction/Internal

- Internally, turn head to _____ place _____ thumb on _____ back, bottom molar. Wrap fingers under jaw. Press down on molar as lift on jaw (hinge motion), gently. Do not pull jaw forward. Hold 6 counts - do 3x-2x/day.

Home Exercises Stabilization

Home Exercises Stabilization/Diagonals

Place fingers as shown in indicated exercises. Resist slight pressure of fingers with jaw muscles - in direction shown. Hold 6 counts do 3x-2x/day.

Home Exercise Myofascial Release Lateral Pterygoid

- Place index finger inside mouth, under cheek bone. Point finger up and towards opposite eye. Apply pressure to muscle until it relaxes. To check positioning of finger, actively move jaw in opposite direction and muscle will contract under finger.
- Hold until relaxes - do 1x,1-2x/day.

Home Exercise Myofascial Release Masseter

- Pinch cheek, just under cheek bone. Apply pressure until relaxes. To check finger positioning gently put teeth together and muscle will contract.
- Hold until relaxes - 1x,1-2x/day.

Home Exercise Myofascial Release Medial Pterygoid

- Place index finger, on muscle at inside of bottom teeth in mouth. Place opposite thumb under jaw line below ear. Apply pressure to muscle as if to touch finger and thumb. Move along gum line until reach incisors in front.
- Hold until relaxes - 1-2x,1-2x/day

Home Exercise Prolonged Stretch

- Place ____tongue depressors on _____side - sliding back until touches back molars. Increase number of tongue depressors until stretch felt. Hold in place for 30-60 seconds; do 3x, 2x/day. Increase number of tongue depressors as tolerated

Goals

- Subjective
  - Pain scale
  - Headaches-frequency, intensity, duration
- Objective
  - ROM
  - Joint mobility
  - Muscle tension
  - Provocation tests
- Functional
  - Sleep patterns
  - Chewing, clenching, yawning, talking
  - Medication use

Diagnostic Testing

- Transcranial radiography
  - Lateral x-ray of skull
- Arthrography
  - Infusion of radiological opaque fluid in the joint space
  - Specific for disc disorders
- Computed tomography (CT)
- Magnetic resonance imaging (MRI)
- Ultrasound - compared to others, over 69% in specificity and sensitivity for pathology of the TMJ disc and joint effusion

Surgeries

- Enlargement of joint space
- Repair of the disc or ligament - past use of proplast
- Discectomy - arthroscopic
- Post surgery intervention
  - Soft food diet
  - Immobilization
  - Splint therapy
  - Goals
    - Restorative AROM and strength
    - Minimize edema and reflex guarding

Total Joint Replacement

- Comparison:
  - Christensen prosthesis - increased post-op pain
  - TMJ concepts prosthesis - increased eating ability, opening, decreased pain with increased jaw function
  - Both good skeletal and occlusal stability

Case Studies

- Mrs. Hurtsalot comes to your department with a headache and a sore left TMJ. She denies any clicking in her jaw. She has 35 mm of active opening and 40 mm of passive opening. She has noted her bite being "off" and admits to being a clencher. What do you suspect is her problem and what would you do for her?

Answer

- **Left lateral pterygoid involvement**
- Pain relief modalities
- Manual therapy - joint mobilization, craniosacral therapy, myofascial release - including to upper cervical region
- Home exercise program/life style changes
- Tongue positioning
- Self-joint distraction
- Self myofascial release
  - Eliminating parafunctional behavior
  - Postural instruction
  - Conjunction with splint therapy
  - Conjunction with biofeedback and counseling

Case Studies

- Mr. J. Breaker is mad because he can no longer eat his large sandwiches that he has enjoyed for 40 years of his life. He has 25 mm of opening which deviates to the right. He no longer has clicking in his R TMJ but has in the past and has had two incidences of locking. No pain in jaw - he just wants to have full function. What do you suspect is his problem and what would you do for him?

Answer

Right joint arthritis

- Modalities
  - Iontophoresis
  - Ultrasound - pulsed
  - Cold
- Manual therapy
  - Joint distraction to stretch
  - Home exercises
  - Self TMJ distraction
  - Joint protection techniques

Case Studies

- Ms. Terry Goid has a very stressful life and chews gum constantly. Recently she has noted popping in her left jaw mostly while eating steak or taffy. Negative weight bearing test and plagued with sinusitis and stuffiness in her ears. What would you suspect is her problem and what else would you check?

Answer

- **Left masseter and medial pterygoid muscle involvement**
- Also check other jaw muscles for involvement and clear neck for any referred symptoms or involvement

Case Studies

- Miss T.M. Joint thinks she could be in a freak show, she can dislocate her joints, can have octopus hands, and fit her whole fist in her mouth. Yesterday she yawned and her jaw was stuck open. Now she has pain in her right jaw. What happened and what kind of treatment does she need to prevent this from happening again?

Answer

- **Right joint subluxation**
- Add to home exercise program for myofascial pain dysfunction:
  - Limited opening - no noise
  - Stabilization exercise

Case Studies

- Ms. Dee Rangement has horrible headaches across her supraorbital area with pressure behind her eyes and pain along her temples. She denies any auras with these headaches. She was in a MVA and sustained a whiplash injury a month ago. She is a secretary and has a very stressful job. What do you suspect is the problem and what would you do?

Answer

- **Temporalis muscle involvement**
- Modalities
  - Ultrasound-1.0 watts/cm2-5 minutes to joint or muscle
  - Heat
  - Electrical stimulation - microcurrent
- Manual therapy - joint mobilization, craniosacral therapy, myofascial release - including to upper cervical region
- Home exercises and lifestyle changes as for other MPD

Case Studies

- Mrs. Connie Dyle is bothered by clicking in her jaw and has started to have pain on her right side. She is able to open to two fingers width before the click, and deviates to the right. She is very sore along the joint itself. What do you suspect is the problem and what would be the treatment protocol?

Answer

- **Right internal derangement**
- Modalities
  - Iontophoresis - dexamethasone
  - Electrical stimulation
  - Cold - ice massage
- Manual techniques
  - Joint distraction
  - Craniosacral therapy
- Joint protection techniques
  - Limit motion to no noise
  - Soft food diet or chewing behaviors

Home exercise instruction

- Change parafunctional behavior
- Self joint distraction techniques
- Tongue positioning for relaxation

Where do we fit in?

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