

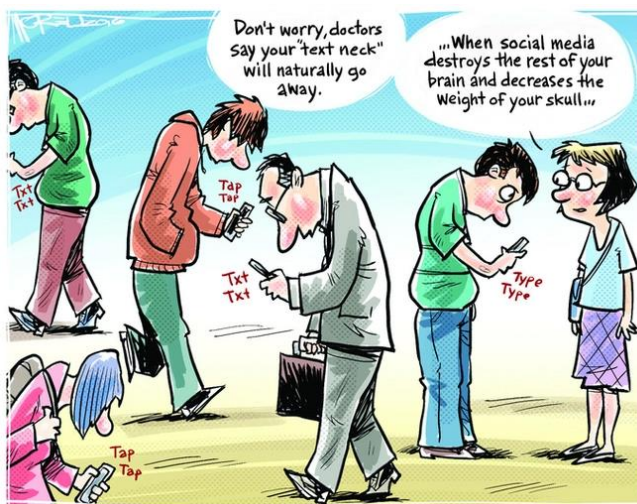
Treatment Options for the Neck and TMJ Conditions

By Lily Chiu
Myotherapist (Adv Dip RM)

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“Text Neck”



https://thumbnailer.digitallnz.org/?resize=664%3E&src=http%3A%2F%2Fndhodeliver.natlib.govt.nz%2FNLNZStreamGate%2Fget%3Fdps_pid%3DIE26789917&format=webp

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“An important component of the physical assessment and management of CMD is mandibular rest position and its relationship to forward head posture”

- Curl (1994)

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Forward Head Posture

- The role of craniocervical posture has an influence on the stomatognathic system (ie. mouth, jaw & associated structures).....*Makovsky 2000, Moya et al 1994, Rocabado & Iglarsh 1991*
- Altered states impact on joint mechanics and *Visscher et al 2000*
- Affect the level of muscle activity*Funakoshi et al 1976*




Image source from <http://new.eziahp.com/wp-content/uploads/2012/10/video-game-forward-head-posture.jpeg>
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Head Posture and Cranio-mandibular posture

The biomechanical relationships of:

- Mandible to the cranio-maxillary complex
- Temporomandibular joints
- Atlas and the cervical
- Face
- Breathing
- Swallowing
- Thoracic vertebrae
- Shoulders, clavicles and sternum



Image source from <http://recruiterpoet.files.wordpress.com/2013/08/text2.jpg>
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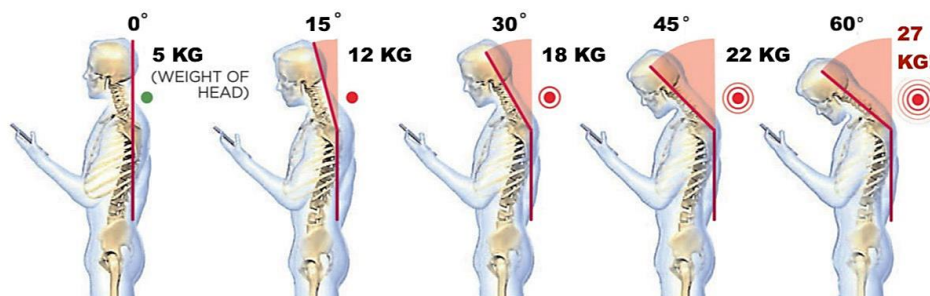
All are affected during the action of mastication and swallowing.

Many of these structure either share the same neuro-muscular system or have close commonalities.

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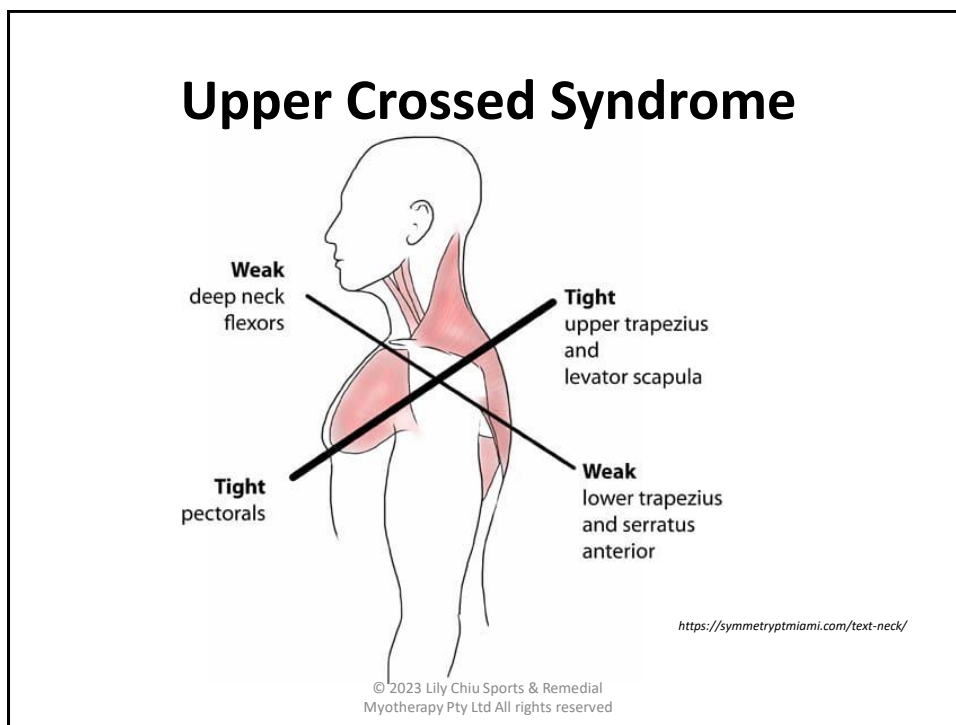
The Greater the Head is Angled Forward The Greater the Weighted Forces on the neck



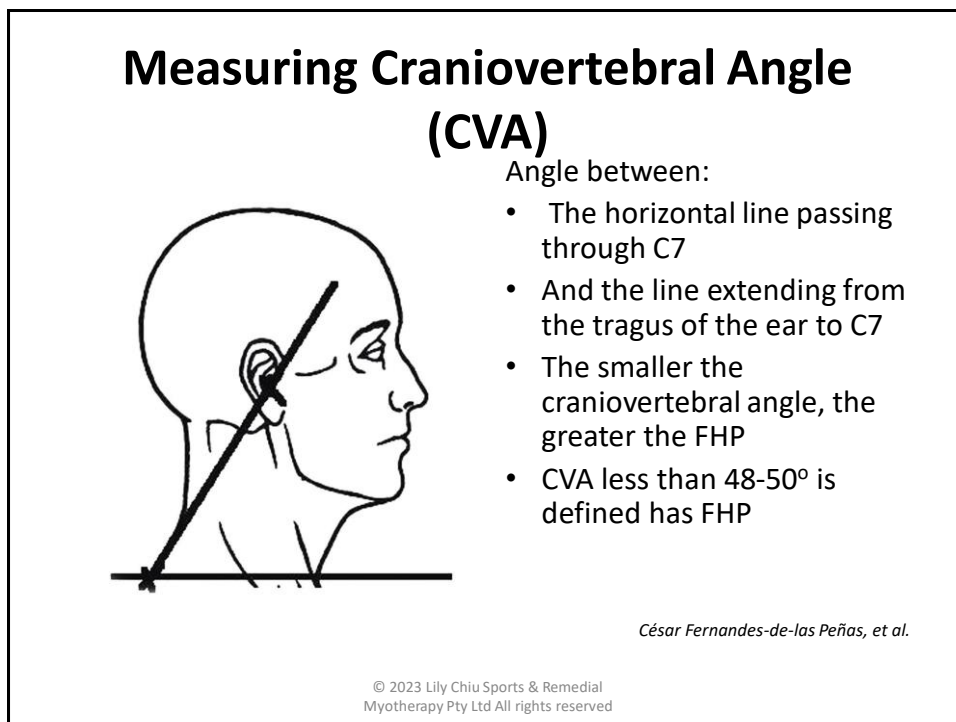
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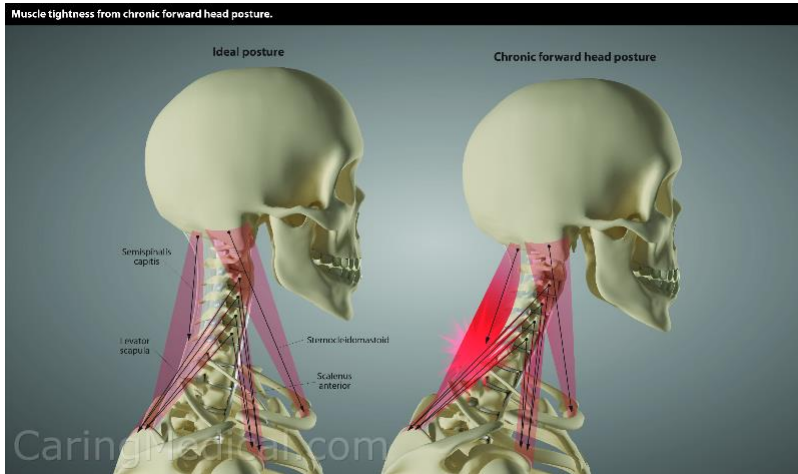


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Load 'Em Up



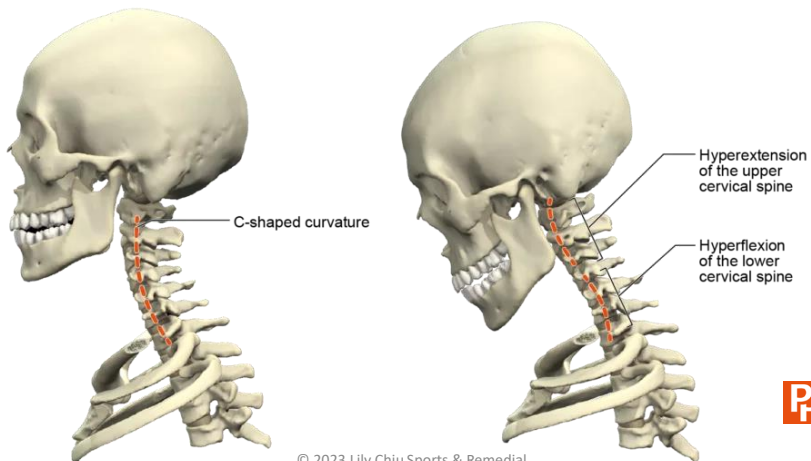
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Changed Shape to Cervical Spine

HEALTHY CURVATURE OF CERVICAL SPINE

ABNORMAL CURVATURE OF CERVICAL SPINE
CAUSED BY TEXT NECK



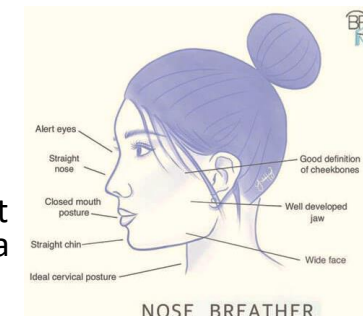
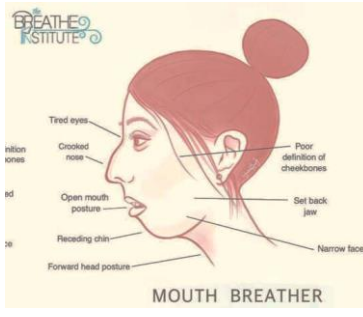
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Effects of FHP on oral structures

The following are typically present with a forward head posture and a variety of symptoms related to TMD.

- Patients with deep bites
- Retruded lower jaws (Class II mal-occlusion),
- Deficient vertical dimension,
- Narrow intra-oral arches

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Nose Breathing Benefits

Mouth Breathing

Improper Posture

- Blocked airway ❌
- Tongue not on roof of mouth ❌
- Recessed jawline & chin ❌

Nasal Breathing

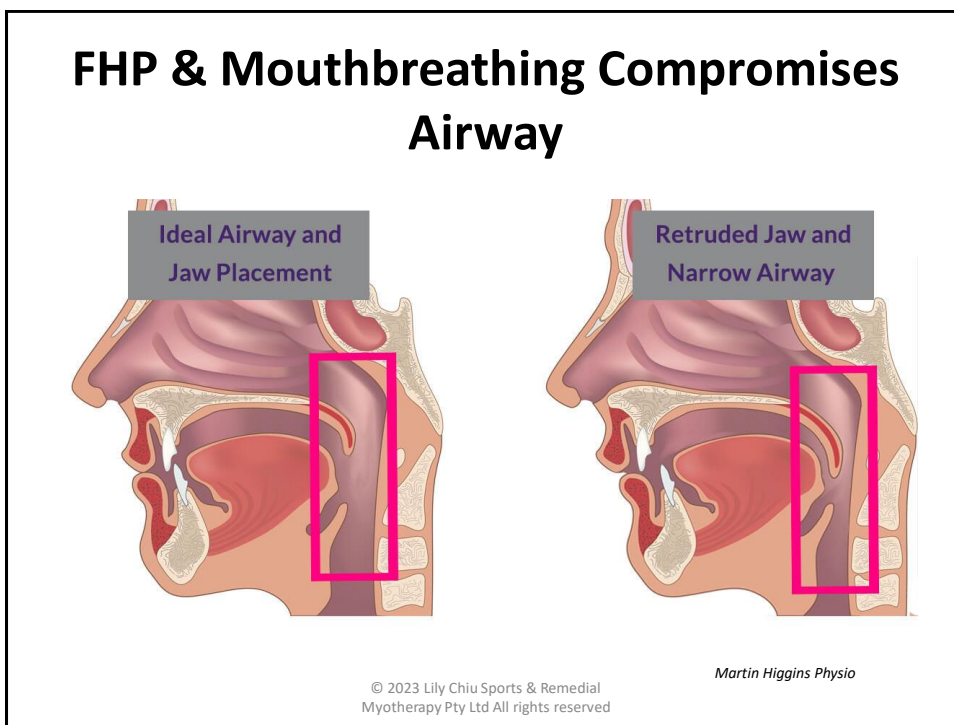
Proper Posture

- Functioning airway ✅
- Tongue on roof of mouth ✅
- Defined jawline & chin ✅

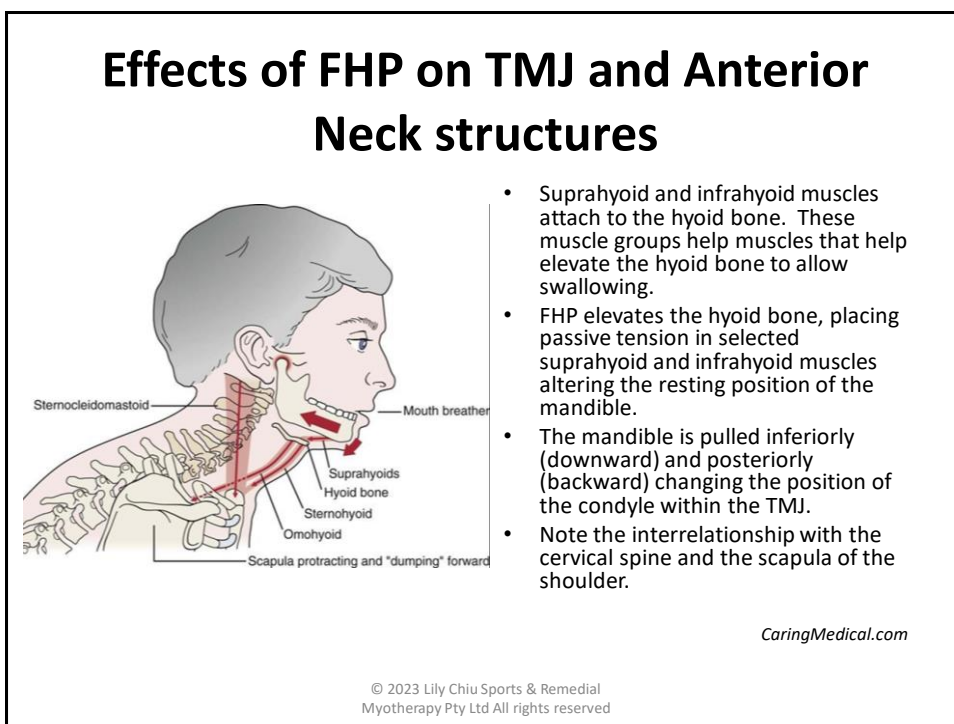
<https://www.mewing.app/blog/mouth-breathing-vs-nose-breathing>

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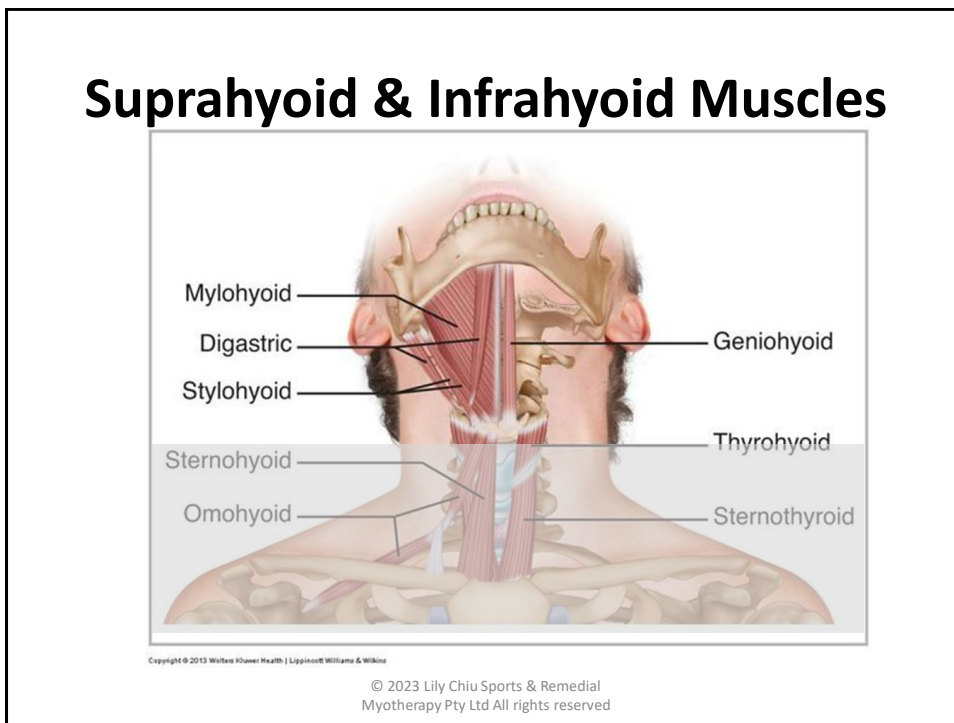
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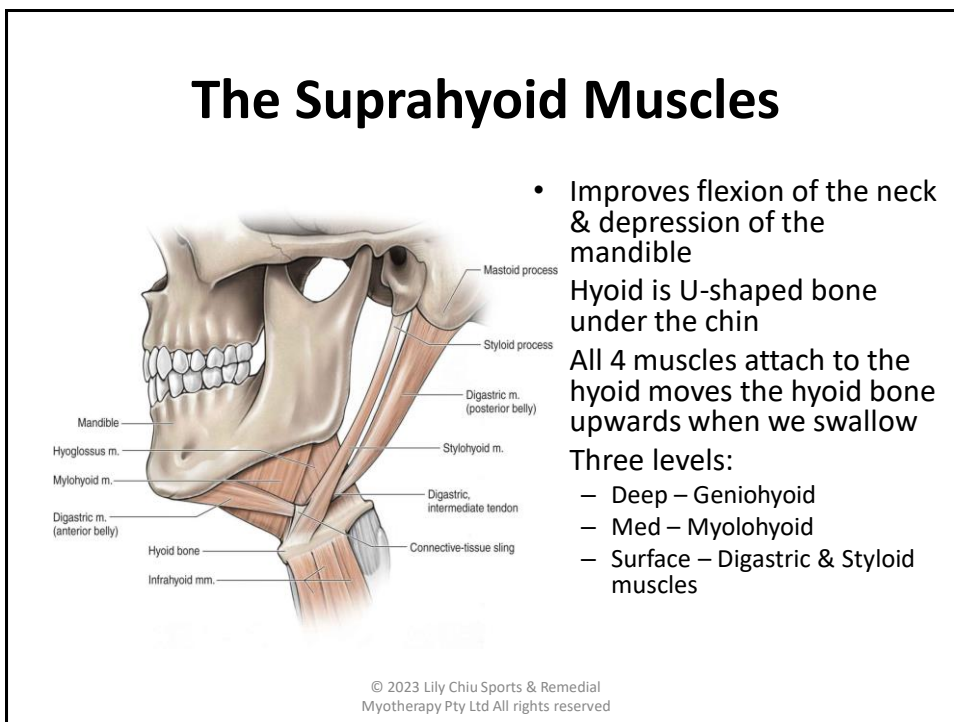
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Craniomandibular Disorder (CMD)

- Disorders from the temporomandibular joint (TMJ) and the biomechanical structures.
- Craniomandibular includes structures beyond the TMJ
 - Cranium
 - Dental occlusion

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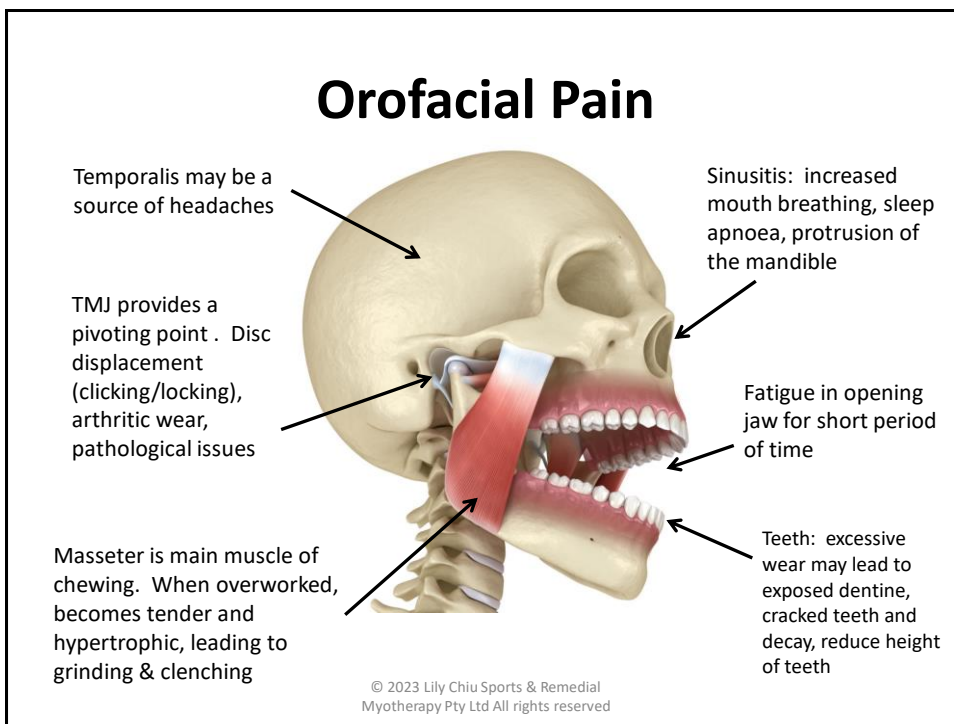


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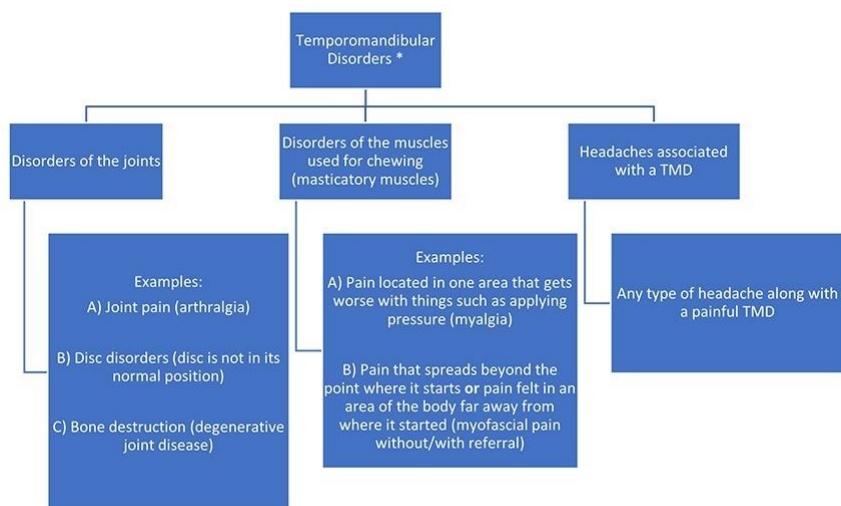
Temporomandibular Joint Disorder (TMD)

- TMJ pain relatively common condition
- Symptoms occur up to 60-70% of population experience at least one TMD symptom
- Mostly affecting adults aged 20-50 years
- Women are at least 4 times more likely to suffer from TMD (4:1 of men)
- Of which 3.6-7% seek treatment
- Treatment occurs in 5%-12% of the population



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<https://www.nidcr.nih.gov/health-info/tmd>

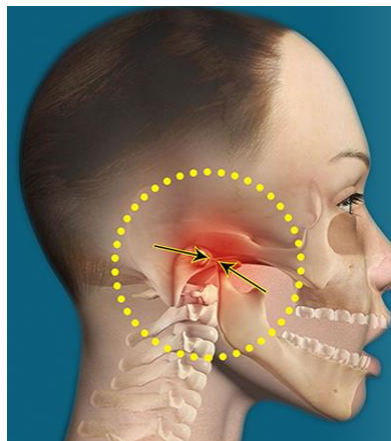
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TMJ Dysfunction (TMD)

TMD also known as:

- Craniomandibular dysfunction (CMD)
- Myofascial pain disorder
- Facial arthromyalgia
- Costen's syndrome (Mandibular Joint Neuralgia)
 - Neurological symptoms:
 - Ear pain (otalgia),
 - tinnitus,
 - fullness in ear,
 - glossodynia (tongue pain)

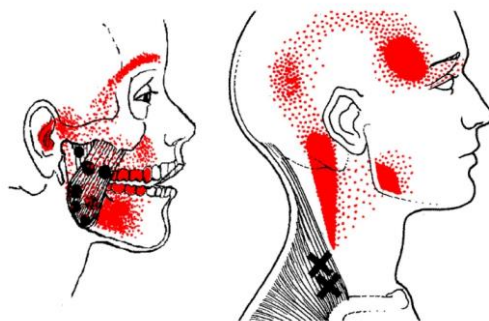


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Pain Patterns commonly include:

- Unilateral dull ache in the TMJ, ear & jaw
- Radiation to the head neck & shoulder
- Clinical approach should include:
 - Face, head & neck pain
 - Muscles of mastication
 - The spine including the sacroiliac joints



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TMJ Dysfunction (TMD)

- Mechanical displacement of the mandibular condyle results in the pain the in the posterior joint structure
 - Malocclusion or loss of posterior teeth may contribute to condylar displacement
- Muscular theory: myofascial source of pain
 - Hypersensitive trigger points
 - Muscle shortening, spasms, contractions
- Neuromuscular
 - Periodontal proprioceptors, muscle spindles & joint receptors induced by parafunctional oral movements, eg. Bruxism, clenching
 - Occlusal interferences
- Psychophysiological theory
 - Emphasizes emotional tension

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Etiology

- 1. Muscle and Joint Function - myofascial pain and dysfunction**
- 2. Factors Affecting the Joint**
- 3. Other problems affecting the joint**

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Etiology

1. Muscle and Joint Function - myofascial pain and dysfunction

- Chronic pain syndromes or increased pain sensitivity
- Psychological factors may be a contributing factor
- Muscle overactivity: Bruxism
- Dental malocclusion
- TMJ dysfunction used to be seen as a dental condition, now it is considered a multifactorial problem.

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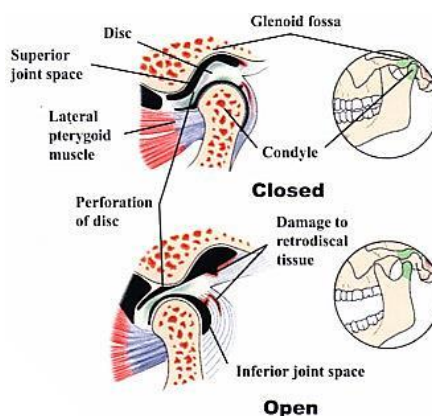
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Etiology

2. Factors Affecting the Joint

Internal derangement of the joint

- Displaced disc
- Dislocated jaw
- Injury to the condyle
- Osteoarthritis
- Rheumatoid arthritis



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Etiology

3. Other problems affecting the joint

- Other types of Degenerative/inflammatory joint disorder
- Trauma
- TMJ hypermobility/hypomobility
- Infection
- Congenital disorders
- Tumors
- Extended dental treatments
- Yawning or sneezing



Image courtesy of <https://pixabay.com/en/argument-conflict-controversy-238529/>

A person can have one or more of these conditions at the same time

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Muscle Dysfunction and Pain

Muscles become dysfunctional due to:

- Chronic clenching
- Chronic grinding
- Imbalanced bite
- Injury to head neck & jaw (direct impact or whiplash)
- Headaches, any & all types
- Neck pain,
- Eye strain, eye pain
- Tooth pain, ear pain
- Facial pain, numbness or tingling to face of fingertips,
- Tinnitus, vertigo & more
- No testing scanning or imaging that can identify these dysfunctional muscles

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Observations

- General posture, health
- Orofacial dysfunction:
 - Voluntary or involuntary facial habits or speech defects
 - Hypertrophy of facial muscles, redness or swelling
- Dental: overbite, cross/under-bite, orthodontic appliances, dentures or missing teeth

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Observations: TMJ AROM

Elevation – raise the jaw
Depression – lower the jaw
(normal 35-40mm) } Lower compartment

Protrusion – anterior movement
Retrusion – posterior movement } Upper compartment

Lateral movement – alternating retrusion & protrusion
(observe for lateral or zig-zag deviations)

- Limitations in movement
- Hypermobility
- Incoordination (lack of coordination)
- Evidence of pain

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Observations: TMJ Movement

Restricted jaw motion:

- Difficulty biting or chewing
- Diminished ability to open or close the mouth
- Jaw movements increase with pain
- Jaw feels tight, 'catching', 'getting stuck'

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Symptoms of TMD Syndrome

Joint noise

- Clicks & pop and other sounds are common
- A sign that the disc is moving out of alignment
- Not significant unless there are other symptoms



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Symptoms of TMD

Pain:

- Located around TMJ
- Referred pain to head, face, neck & ear
- Pain located immediately in front of ear (tragus) projecting to the ear, temple cheek, along the mandible



Image source from <http://drsecter.com/blog/wp-content/uploads/apple1.jpg>
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Source: <http://www.drhalstewart.com/dallas-tmj-specialist/>

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TMD may be a manifestation of a multifactorial disturbances in function of an of the following components:

- TMJ articular mechanism
- Muscles of mastication
- Dental occlusion
- Structural and biomechanical aspects of the cranial vault and facial bones
- Myofascial structures that sustain postural relationships of the mandible, head, neck and shoulder regions
- Afferent neural input from teeth, joints, muscles, fascia and ligaments of the CMD anatomy and subsequent efferent responses
- Centrally generated nervous system phenomena possibly responsible for bruxism, clenching and other oral habits

Shelvin & Mottram

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Determining the Cause Guides the Treatment

- Diagnosing TMJ disorders are complex
- Different diagnostic procedures may be used
- Determining the cause of a TMJ problem is important, because it is *the cause that guides the treatment.*

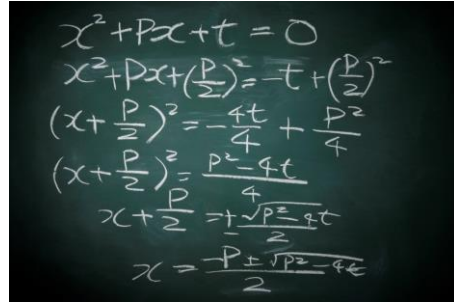


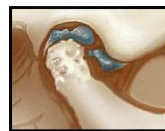
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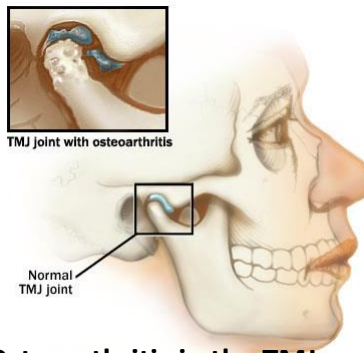
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Bruxism

- Constant grinding also causes pressure on the TMJ.
- Puts pressure on the articular disc, squeezing out synovial fluid and robbing it of lubrication.
- Lack of randomised controlled trials relating to the relationship between bruxism and headaches during wakefulness



TMJ joint with osteoarthritis



Normal TMJ joint

Osteoarthritis in the TMJ

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Image source from <http://encinotmjigraine.com/wp-content/uploads/2014/04/arthritis.jpg>
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Use of Occlusal Guards/Night Splints



- Protect the teeth from damage
- Prevents full contact/grinding of the condyles of the TMJ

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Assessment

- Full detailed history of causes, onset of headache/TMD
- Referred pain patterns
- Intensity of symptoms
- Frequency of symptoms
- Duration of symptoms
- Aggravating factors/triggers
- Easing factors
- Rule out sinister pathologies
- Rule out non-musculoskeletal factors

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Assessment Techniques: Measure size of incisor opening

- Normal range in women is 35-45mm
- Normal range in men is 45-54mm
- Measure in supine to remove cervical influence on jaw range



Image source from <http://mitchgriesneuromusculartherapy.com/wp-content/uploads/2011/01/TMJ-300x225.jpg>
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Assessment Techniques: Measure size of incisor opening



Image source from <http://portugalresident.com/sites/default/files/Normal%20opening.jpg>
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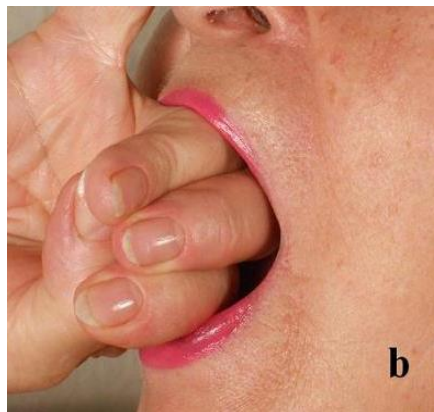


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Treatments: Non-Invasive Treatments

Alternative:

- Acupressure
- Acupuncture
- Dry Needling
- Hypnosis
- Massage



Dental Procedures:

- Temporary Occlusal Therapy

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<https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9Gc5GpDprXEbwrsTw9w5DDITvsspzZt1zjPbkO6OBf-elK8weUTfn>

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Treatments

- Medical Interventions:
 - Intra-articular corticosteroid or anaesthetic injections
 - Myofascial trigger-point injection
 - Surgery
- Pharmacologic treatment:
 - Muscle relaxants
 - Nonsteroidal anti-inflammatory meds
 - Antidepressants
 - Sedatives or Antianxiety meds



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http://www.journalofprolotherapy.com/images/issue_07/prolo_for_tmd_fig_08.jpg

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Treatments

- Physiotherapy modalities:
 - Biofeedback
 - Heat therapies
 - Transcutaneous electrical stimulation (TENS)
 - Exercises:
 - Lateral jaw movement
 - Protrusive jaw movement
 - Resisted closing
 - Resisted opening
 - Tongue-up exercises


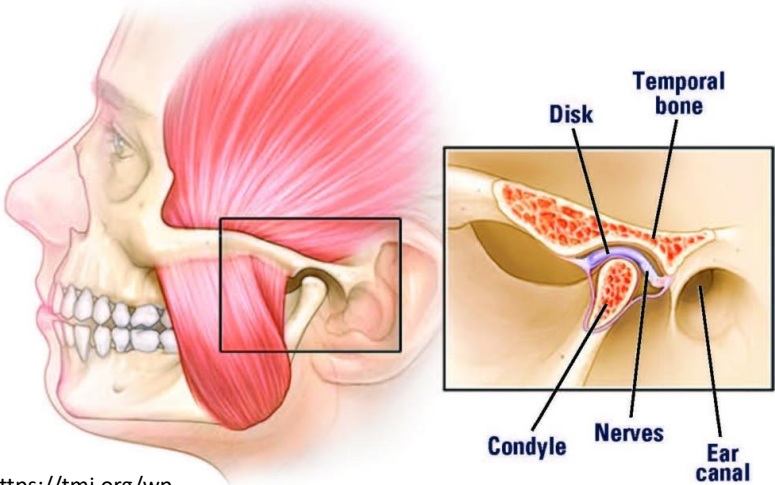


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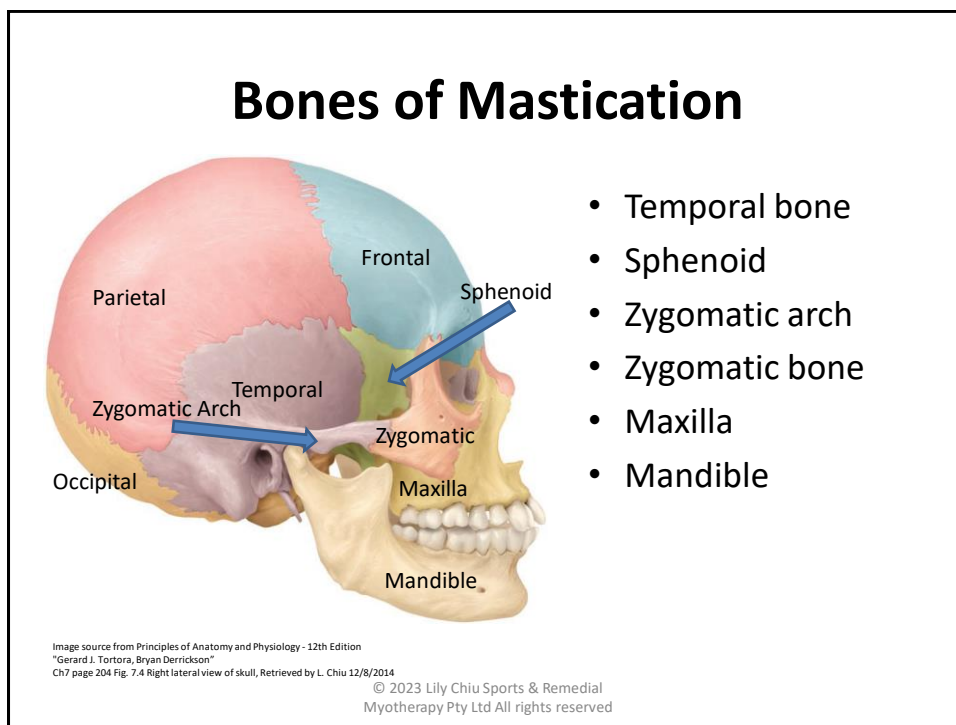
Anatomy



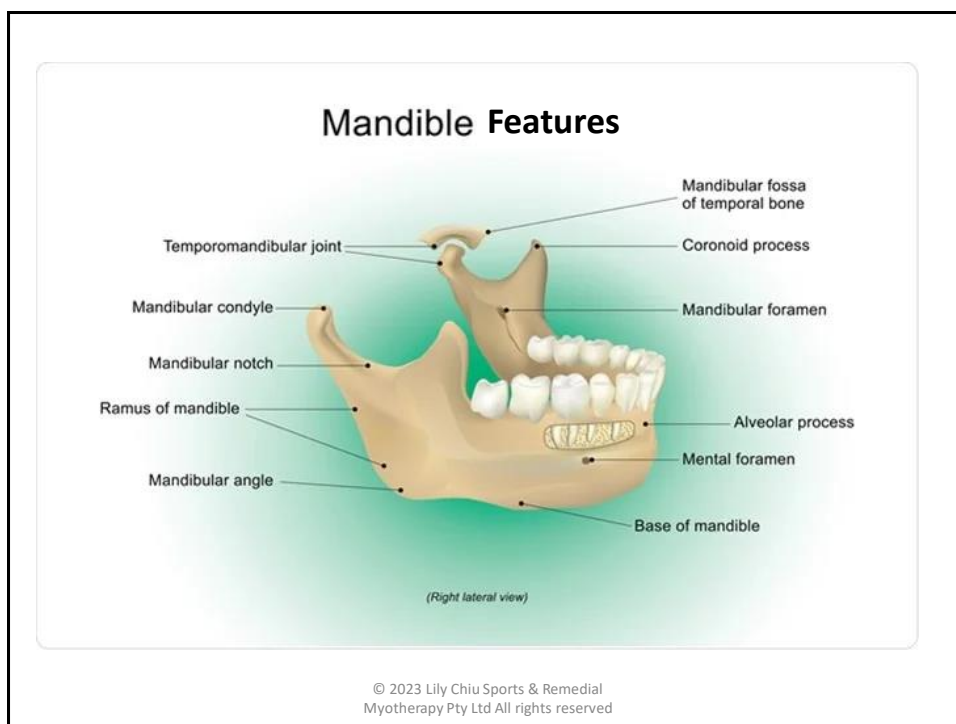
<https://tmj.org/wp-content/uploads/2020/12/Jaw-Joint--1024x688.jpg>

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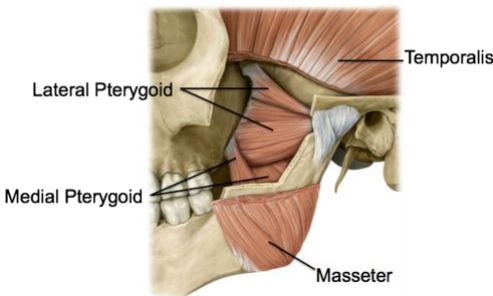
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Muscles of Mastication

- Masseter
- Temporalis
- Lateral Pterygoid
- Medial Pterygoid
- Other Muscles:
 - Digastric
 - Geniohyoid
 - Mylohyoid
 - Stylohyoid



Muscles of Mastication

<https://o.quizlet.com/yPKTZKs0IXpbYYiwTYn4Bg.png>

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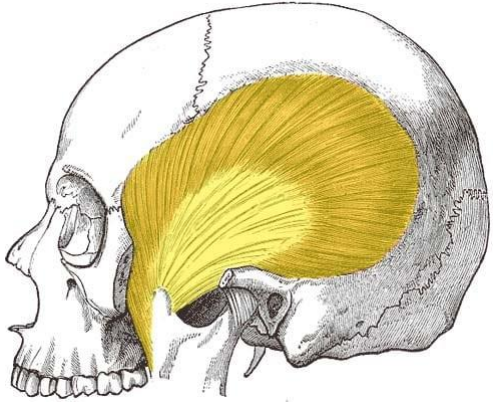
Actions of the TMJ Muscles

Action	TMJ Muscles	Suprahyoid Muscles
Opening of the Mouth	Lateral Pterygoid,	Mylohyoid Geniohyoid Digastric
Closing of the Mouth	Masseter Temporalis Medial Pterygoid	
Protrusion of the Mandible	Lateral Pterygoid Medial Pterygoid Masseter Temporalis (anterior fibres)	Myohyoid Geniohyoid Digastric Stylohyoid
Retraction of Mandible	Temporalis (posterior fibres) Masseter	Myohyoid Geniohyoid Digastric Stylohyoid
Lateral Deviation of Mandible	Lateral Pterygoid (ipsilateral muscle) Medial Pterygoid (contralateral muscle) Temporalis Masseter	

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Temporalis



Origin:

- Temporalis Fossa

Insertion:

- Coronoid process of the mandible

Action:

- Elevation of the mandible
- Retraction of the mandible
- chewing

Nerve Supply:

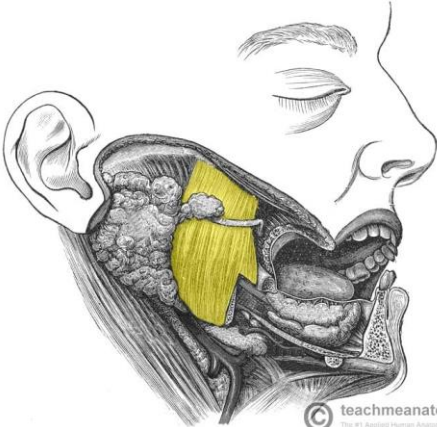
- Anterior & posterior deep temporal nerves from the mandibular nerve, a division of the trigeminal nerve (CN V3)

<https://teachmeanatomy.info/head/muscles/mastication/>

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Masseter



• Origin:

- Zygomatic bone and arch
 - **Superficial** - anterior two thirds
 - **Deep** – posterior third

Insertion:


- Lateral surface of the ramus and angle of mandible

Action:

- Elevation of the mandible
- Adduction of the mandible
- Protrusion of the mandible

Nerve Supply:

- mandibular division of the trigeminal nerve (V)

 The #1 Applied Human Anatomy Site on the Web.

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Lateral Pterygoids

Origin:

- Superior head: the greater wing of the sphenoid
- Inferior head: the lateral surface of the lateral pterygoid plate

Insertion:

- Superior head: capsule and articular disc of the TMJ
- Inferior head: the mandible

Action:

- Protraction of the mandible and aids in mastication

Nerve Supply:

- mandibular division of the trigeminal nerve (CN V)

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Medial Pterygoids

Origin:

- Medial surface of the lateral pterygoid plate
- Palatine bone
- Tuberosity of maxilla

Insertion:

- Medial surface of mandible

Action:

- Protraction and elevation of the mandible

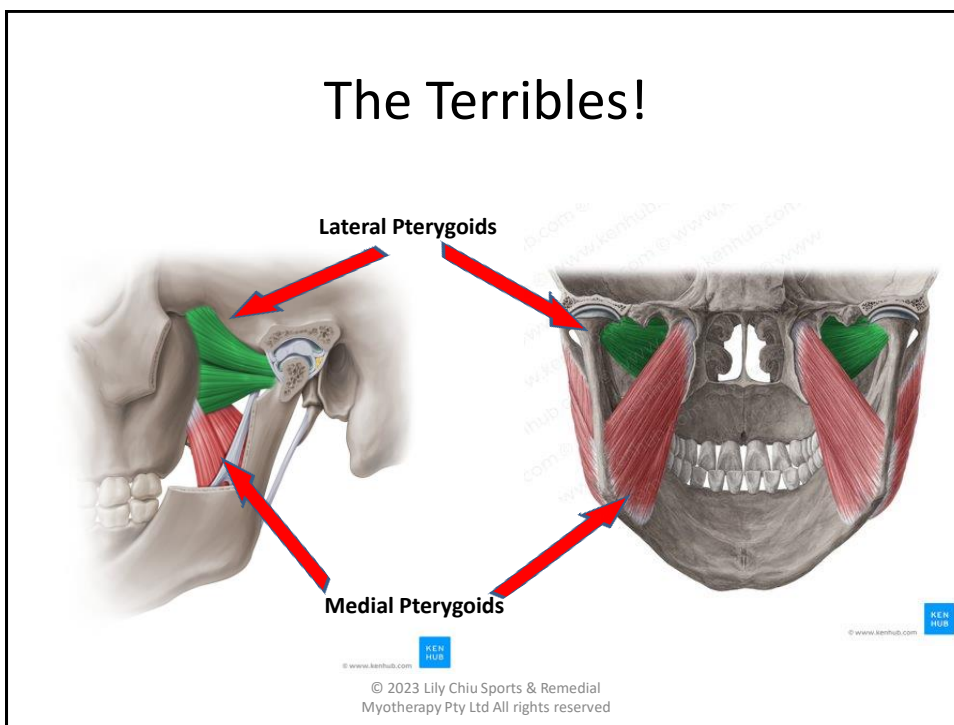
Nerve Supply:

- Medial pterygoid nerve

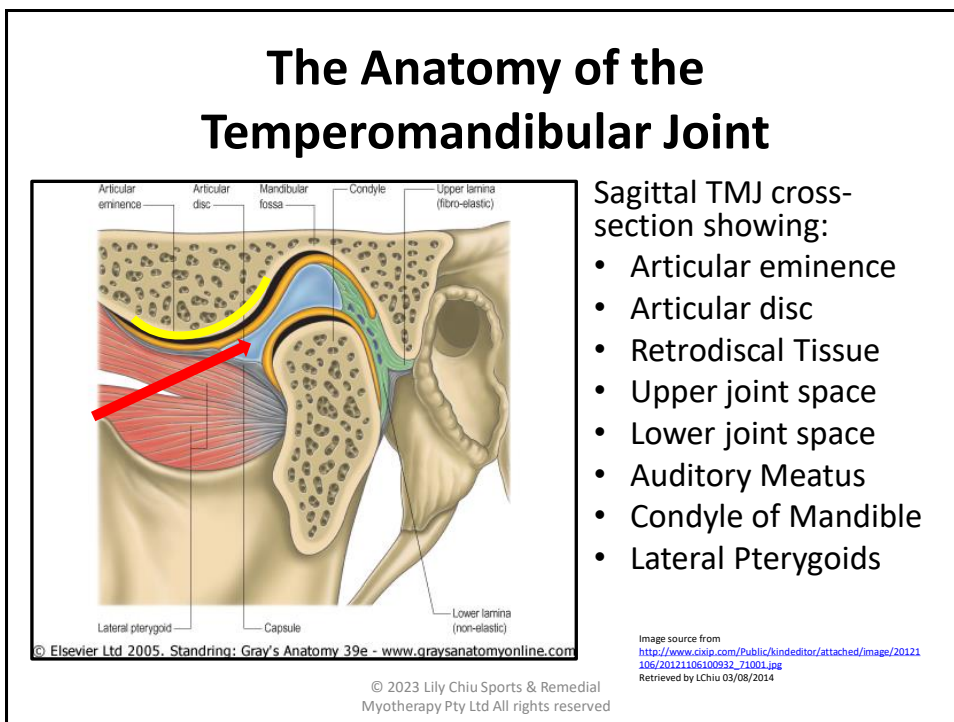
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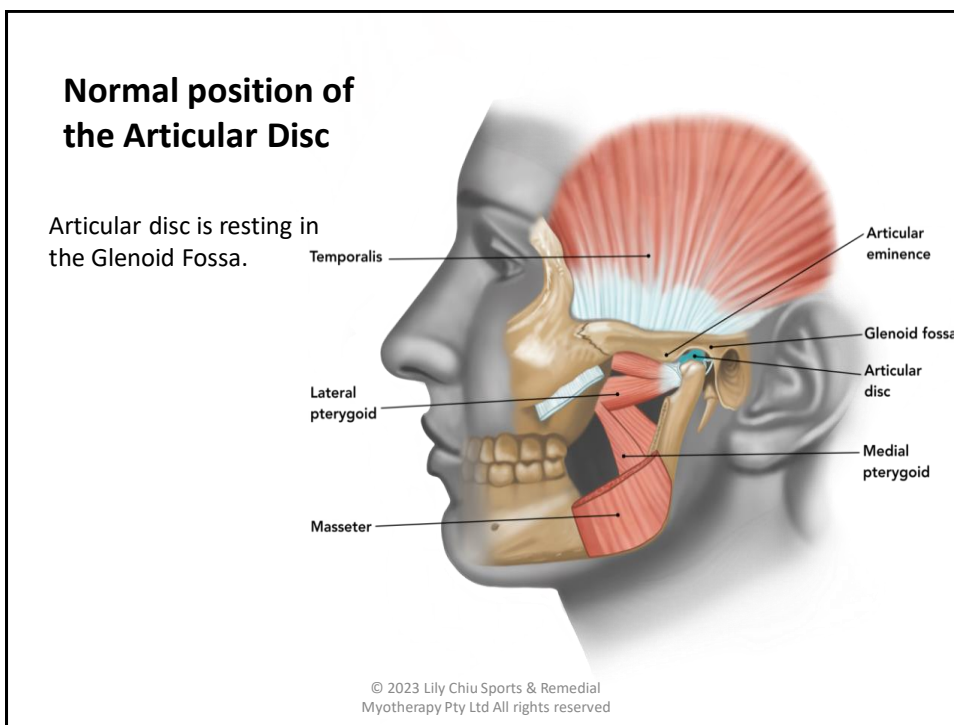
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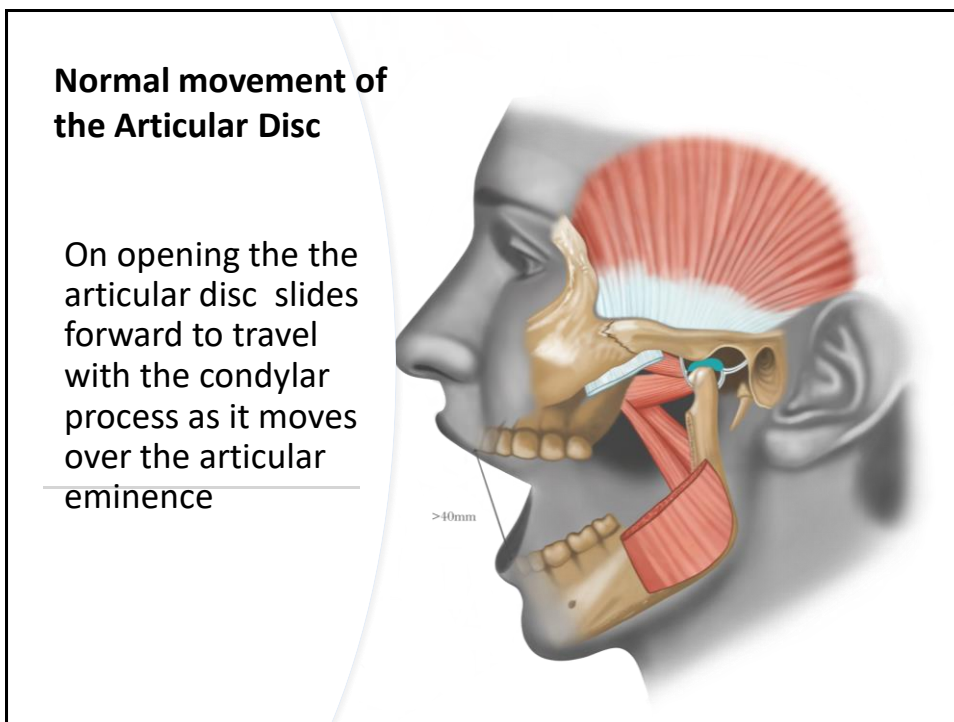
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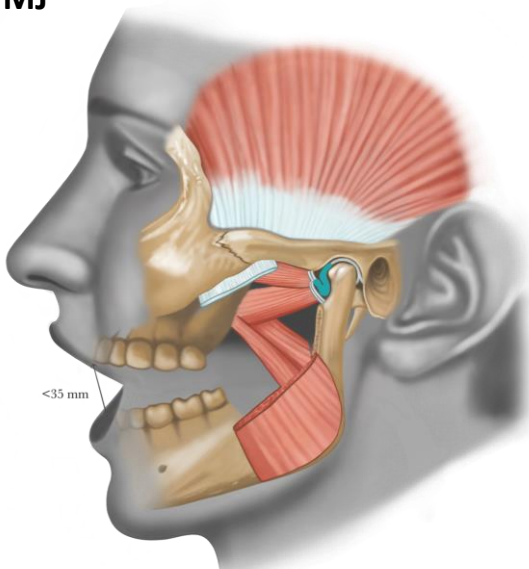
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Disc Dislocation in the TMJ

Disc displacement without reduction: where the disc is stuck in the forward position. Muscles of head neck & jaw goes into spasm.

DDWR or DDWOR
Loud snap, crack or pop
Lateral collateral ligament gets stressed or strained.
DDWR or DDWOR.

The retrodiscal tissue is caught over the condylar process causing pain as this is highly innervated and vascularised.



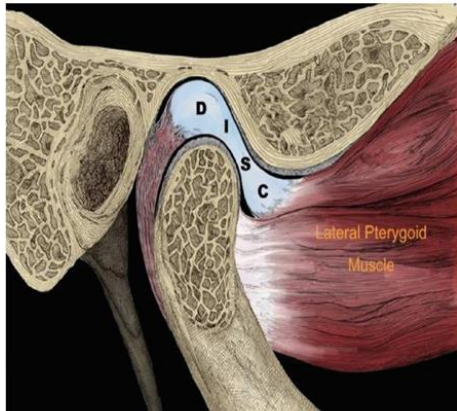
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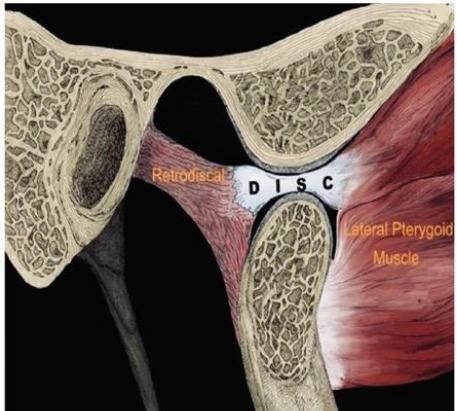
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Normal Disc Position

Closed mouth



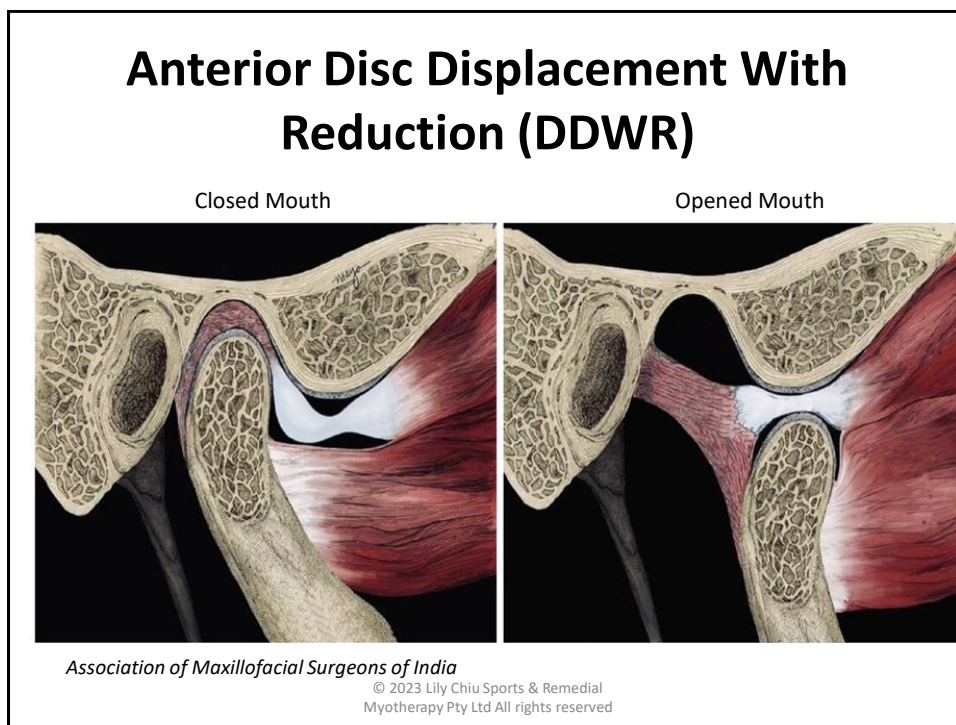
Open mouth



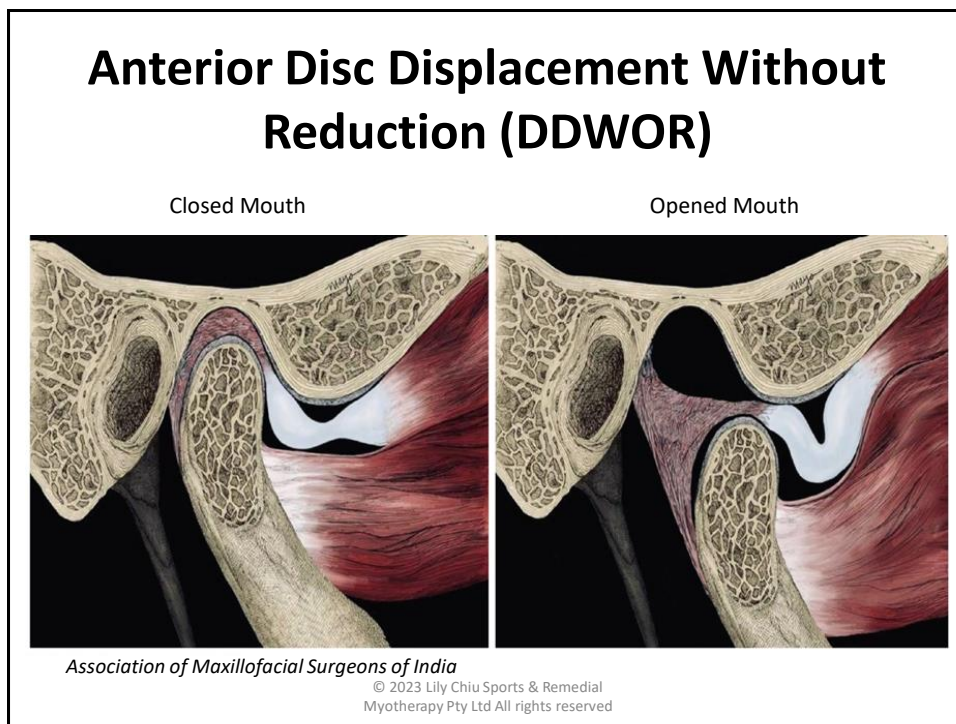
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Mandibular Deviation v Deflection

Mandibular Deviation (DDWR)



Shift in Jaw from midline disappears the more you open

Mandibular Deflection (DDWOR)



Shift in Jaw from midline becomes greater the more you open

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R^G ResearchGate

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Assessment Techniques: Finger in Ear Test



- Gloves on
- Practitioner places 5th fingers in both ears of patient applying mild pressure anteriorly
- Instruct the patient to open/close mouth
- Assess for pain, clicking, movement patterns and the condyle moves
- Pain on palpation indicates retrodiscitis

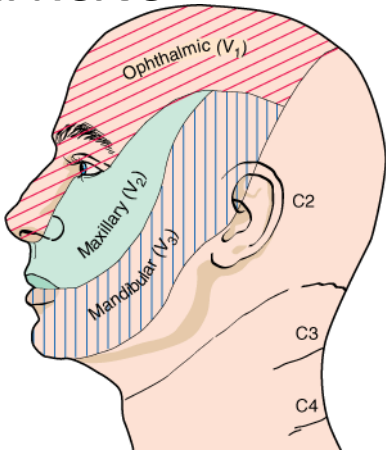
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Somatic Sensations to the Trigeminal Nerve

- The Trigeminal Nerve innervates the masseter and the pterygoid muscles.
- Supplies sensation to the following dermatones:
 - Ophthalmic (V1)
 - Eye
 - Maxilla branch (V2)
 - Upper Jaw
 - Mandibular branch (V3)
 - Lower Jaw



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Postural Cervical Muscles: Pain Patterns & Trigger Points

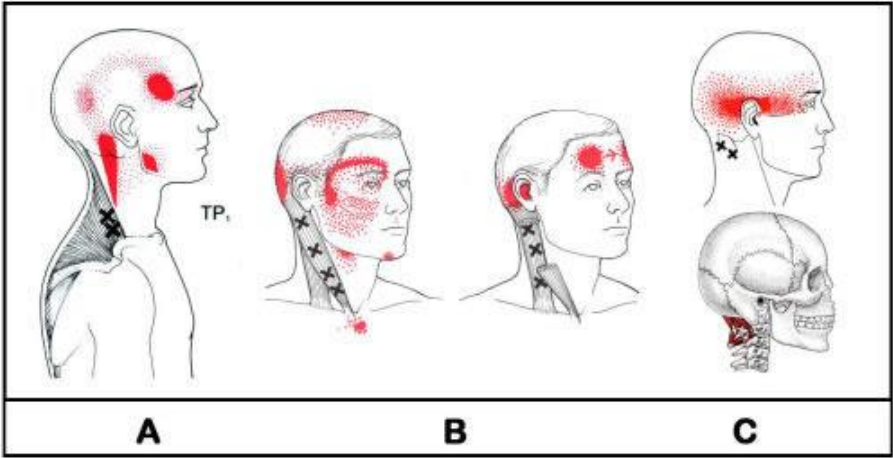


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Treat Neck and Postural influences to TMJD



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Soft Tissue Work to Cervical Muscles



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Pain Patterns to Temporalis

- A tight temporalis can lead to headaches around the temples, popping in the jaw joint, chronic TMJ pain, and facial pain.
- Trigger points in the temporalis can cause pain in several locations including above the eyebrow, just above the upper teeth, and throughout the cheek

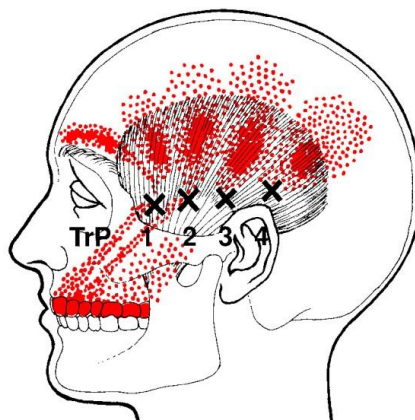


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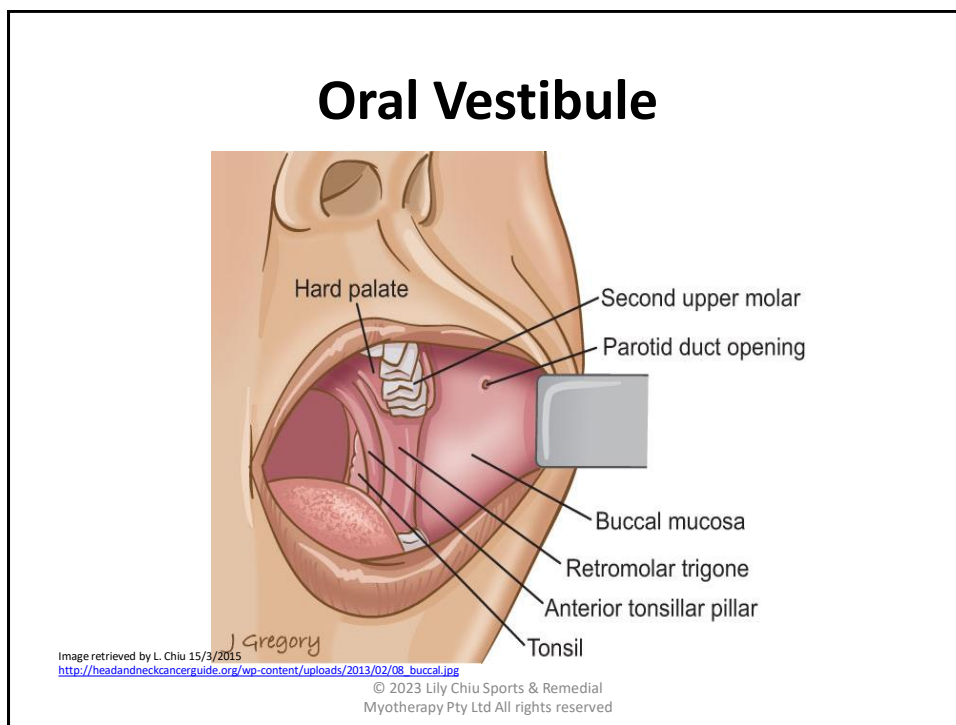
Temporalis



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Pain Patterns of the Masseter

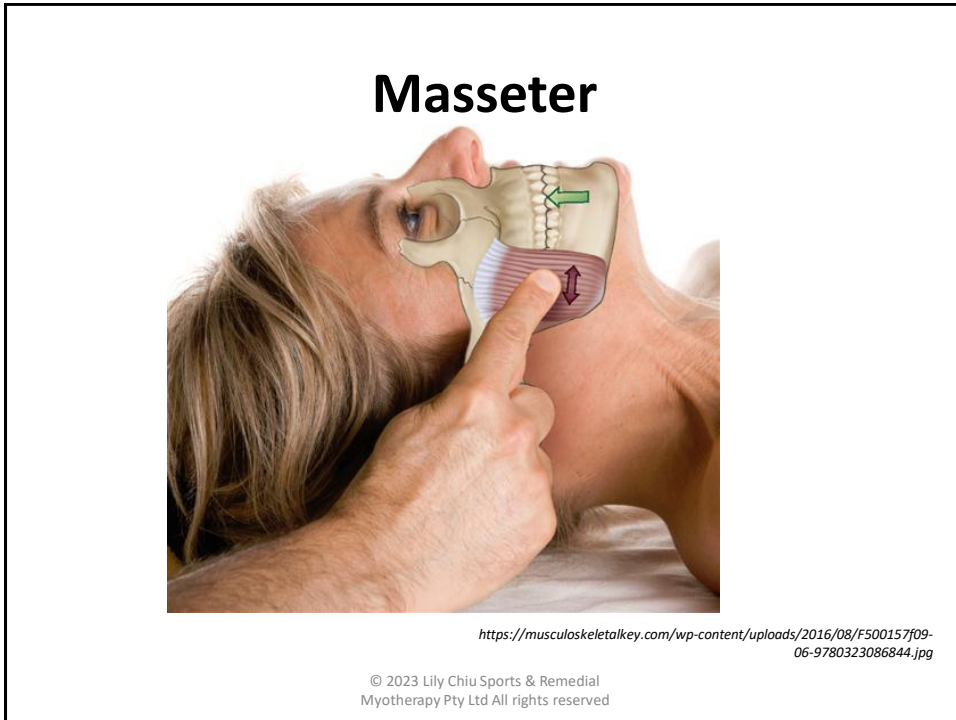
- Trigger points in the masseter can refer pain to the cheeks, lower jaw, upper and lower molar teeth, up into the eyebrow, and deep into the ear and around the temporomandibular joint (see picture above).
- Since the main function of the masseter muscle is to elevate the mandible (the lower jawbone), cases where the person has a hard time opening his mouth usually indicate trigger points in the masseter. One-sided tinnitus can be another clue.

A B
C D

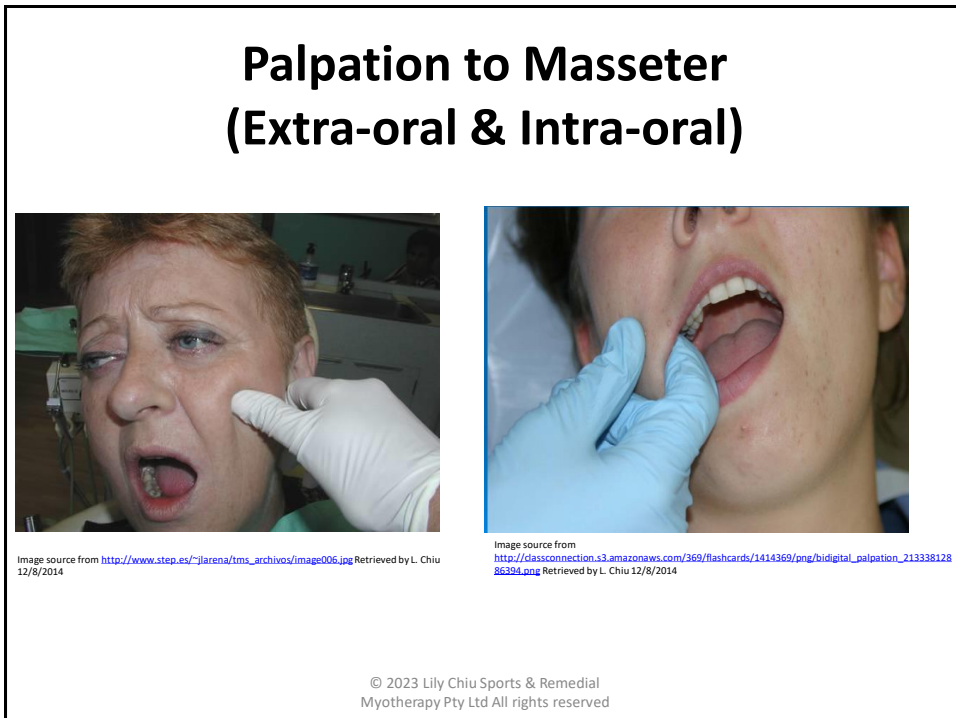
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Intraoral Palpation to Temporalis & Lateral Pterygoids

Temporalis



Lateral Pterygoid




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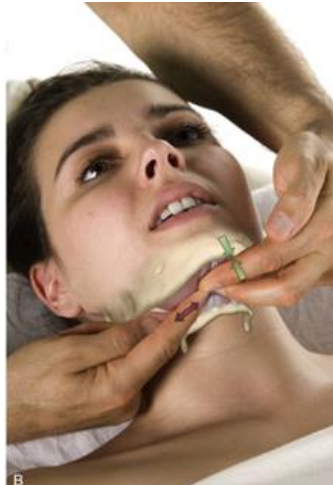
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Suprahyoid Muscles

Posterior Digastric



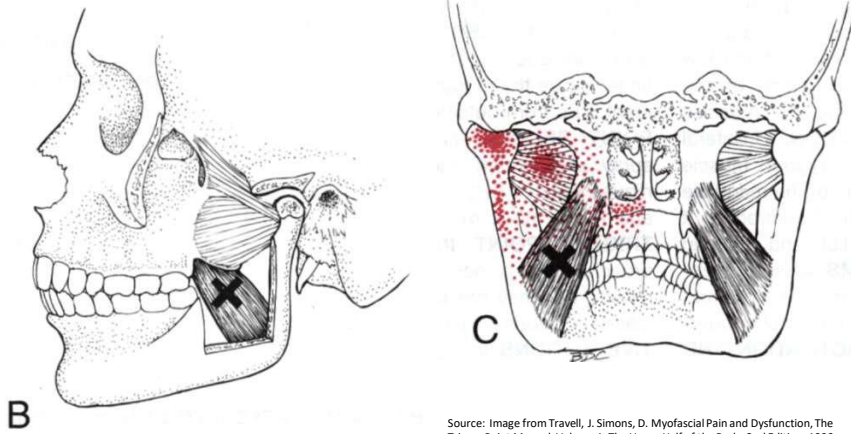
Anterior Digastric



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<https://learnmuscles.com/blog/2017/08/12/unusual-suspects-sternohyoid/>

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Medial Pterygoid pain pattern



Source: Image from Travell, J. Simons, D. Myofascial Pain and Dysfunction, The Trigger Point Manual, Volume 1. The Upper Half of the Body, 2nd Edition, 1999, Lippincott Williams & Wilkins, Fig 16.1 Page 388 Retrieved by L Chiu 03/8/2014

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Medial Pterygoids



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After Care

Following treatment to TMJ advise the patient to avoid hard chewing for 24-48 hours depending on response to treatment.

Avoid chewing on :

crunchy salads,
steaks, gum,
skicky/chewy confectionery

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Acknowledgements

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