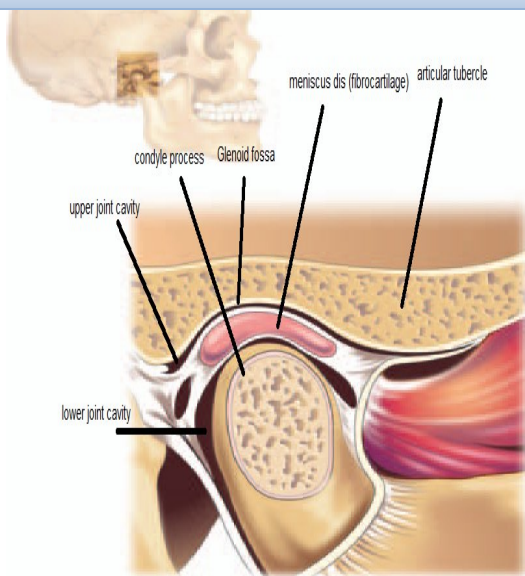


Tempomandibular Joint



TMJ is **synovial/ginglymoarthrodial** (hinge & sliding/ transverse movement) joint between squamous part of the temporal part & **mandible**

The TMJ is composed of **3 parts**:

1. **Glenoid fossa** of the temporal bone
 - Anteriorly: articular tubercle
 - Posteriorly: separated from the tympanic bone by the squamotympanic fissure
 - Laterally: zygomatic arch
 - Medially: styloid process
1. **Articular eminence** of the temporal bone
2. **Condylod process** of the mandible
 - Made of **spongy** bone with **marrow & growth** center
 - Articular** region of the condyle is one of the **most important** mandibular growth sites



The TMJ differs from other joints by the presence of **avascular fibrous tissue** covering the **articulating** surface with an **interposed** meniscus dividing the joint space into an upper & lower compartments

TMJ receives nourishment from the **synovial membrane** which is highly vascularized

Articular disc (meniscus):

Located Between the condyle and temporal bone

Fibrocartilagenous connective tissue that is thicker at the ends

The articular disc is **attached** to the condyle, so when the condyle glides forward and backward, the disc moves with it.

The disc is **avascular & aneural** in the **center** (main load-bearing area) but vascular and innervated at the periphery

Surrounding the articular disc is a fibrous **capsule** that encloses the **entire** joint.

The capsule is divided into **upper** and **lower** cavities by the disc; these cavities are filled with **synovial fluid**.

The **upper** cavity is responsible for **gliding** movement

The **Lower** cavity is responsible for **rotational** movement

Supporting ligament:

temporomandibular ligament is the main supporting ligament

stylomandibular + sphenomandibular ligaments (have no function TMJ articulation)

Blood supply:

Superficial temporal artery; Maxillary artery; deep auricular artery; anterior tympanic artery

Sensory Innervation:

Auriculotemporal nerve

Masseter nerve

Posterior deep temporal nerve

Lateral pterygoid nerve

Costen Syndrome:

Due to TMJ abnormality usually due to impaired bite

Symptoms: Vertigo, Tinnitus, Feeling of Blocked ear, Otalgia, Frontal, parietal, occipital pain

Management: NSAIDs, hot compressors, slow exercise of the joint, bite correction by orthodontist

Muscles of TMJ (muscles of mastication):

Deep muscles: Lateral & medial pterygoid muscle:

the **superior** part of the **lateral** pterygoid muscle is inserted into the **disk** of TMJ

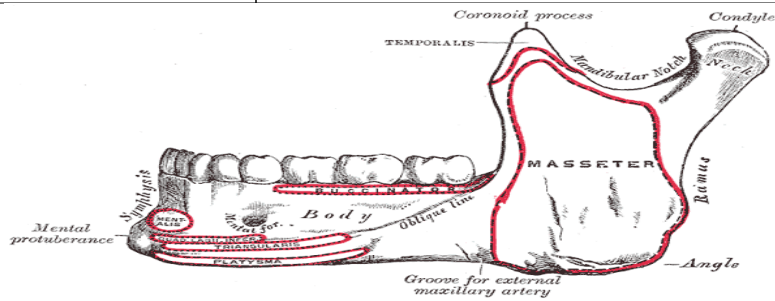
Lateral pterygoid muscle **protract** the mandible

Superficial muscles: Temporalis muscle, Masseter Muscles

Head of masseter	Superficial head (larger part)	Deep Head (smaller part)
Origin	Inferior border of the anterior 2/3 of the zygomatic arch	Inferior border of the posterior 1/3 of the zygomatic arch Medial border of the zygomatic arch
Insertion	Angle of the mandible Inferiolateral part of the mandible ramus	Coronoid process Superiolateral mandibular ramus
Action	Elevates the mandible	Elevation

Muscle name	Origin	Insertion of the mandible	Direction of vector
Lateral pterygoid	Infratemporal surface of the greater wings Lateral surface of the lateral pterygoid plate	Capsule; TMJ Disc Neck of the condyle	Horizontal-anterior
Temporalis process	Temporalis fossa	Coronoid process	Vertical-superior-posterior
Masseter process	Zygomatic process	Coronoid process Mandibular ramus (superficial fibers: inferiolateral Deep fibers:	Superficial fibers: Oblique anterior Deep fibers: Oblique posterior Total fibers: Vertical

		superiolateral)	superior
Medial pterygoid	Medial surface of the lateral pterygoid the tuberosity of the maxilla & tubercle of the palatine bone	Medial surface of mandibular angle	Oblique anterior



Actions	Muscles
Depression (Open mouth)	Lateral pterygoid Suprahyoid Infrahyoid
Elevation (Close mouth)	Temporalis Masseter Medial pterygoid
Protrusion (Protrude chin)	Masseter (superficial fibres) Lateral pterygoid Medial pterygoid
Retrusion (Retrude chin)	Temporalis Masseter (deep fibres)
Side-to-side movements (grinding and chewing)	Temporalis on same side Pterygoid muscles of opposite side Masseter

Note **unilateral** excision of the **condyle** decrease the ability of the **ipsilateral** lateral pterygoid to open the mouth

This joint allows both gliding & hinge movement:
Gliding movement: in the **upper** compartment between the temporal bone & meniscus
Hinge movement: in the **lower** compartment between meniscus & condyle
What is normal interincisal opening? 40-50 mm.