

ANATOMY

HEAD

HEAD

JOINTS

JOINTS

TMJ

TMJ

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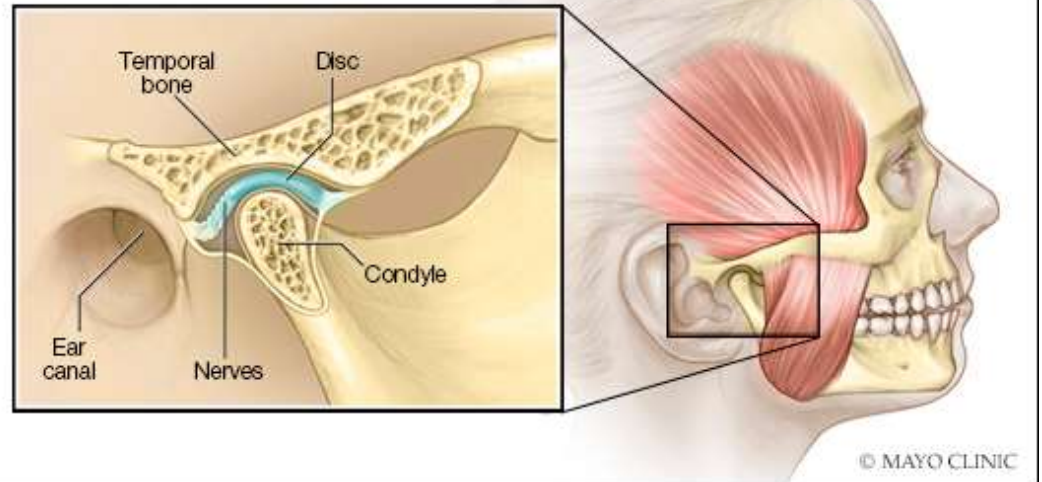
TMJ

- The **temporomandibular joint** (TMJ) is formed by the articulation of the mandible and the temporal bone of the cranium. It is located anteriorly to the tragus of the ear, on the lateral aspect of the face.
- In this article, we shall look at the anatomy of the temporomandibular joint – its articulating surfaces, ligaments and clinical correlations.

TMJ

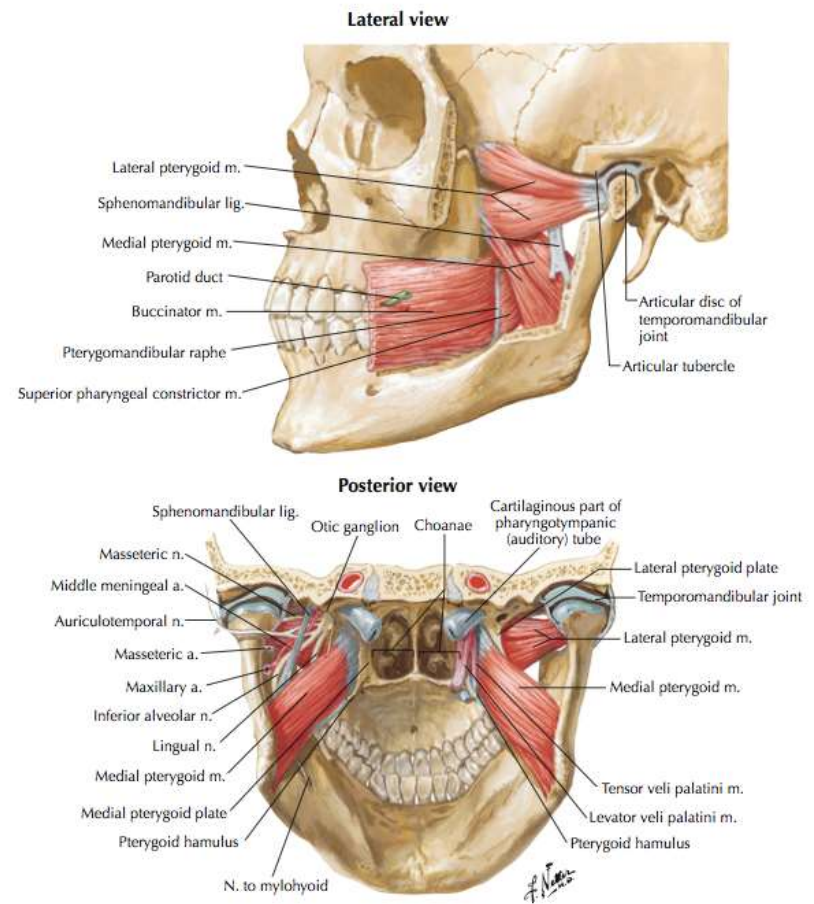
Articulating Surface

TEMPOROMANDIBULAR JOINT



TMJ

Articular Surface





TMJ

Articulating Surfaces

- The temporomandibular joint consists of articulations between **three** surfaces; **the mandibular fossa and articular tubercle (from the squamous part of the temporal bone), and the head of mandible.**
- This joint has a unique mechanism; the articular surfaces of the bones never come into contact with each other – they are separated by an **articular disk**. The presence of such a disk splits the joint into **two** synovial joint cavities, each lined by a synovial membrane. The articular surface of the bones are covered by **fibrocartilage**, not hyaline cartilage.



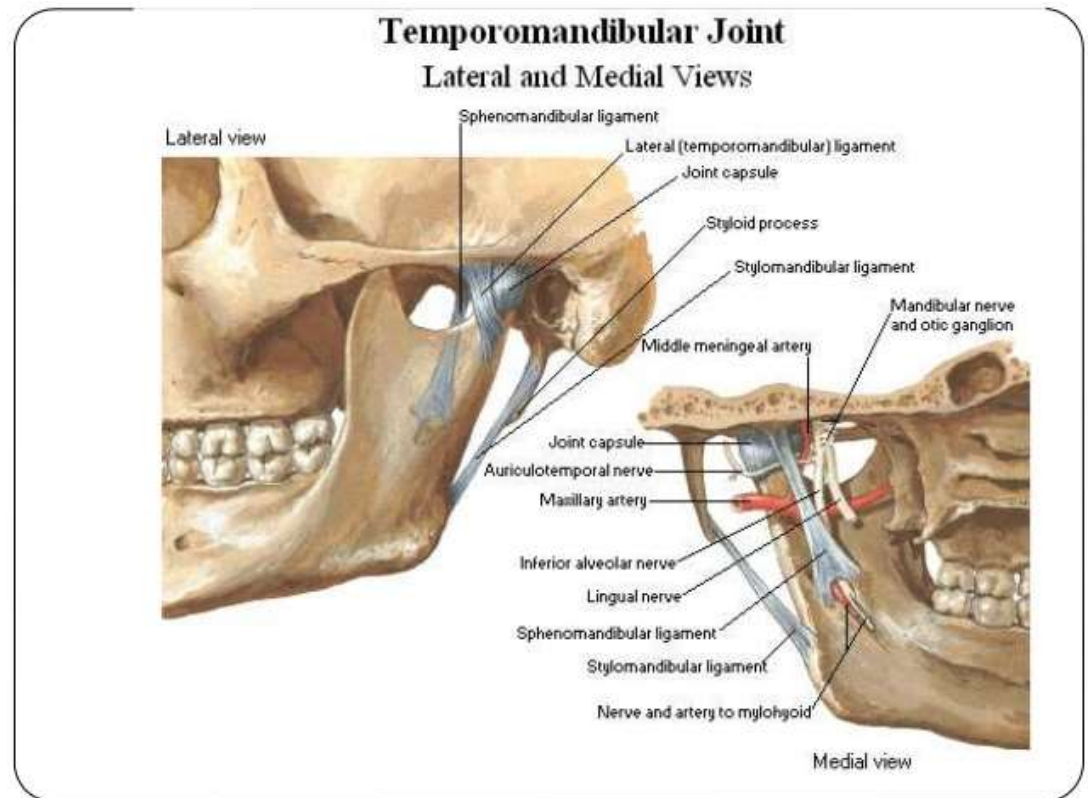
TMJ

Ligaments

- There are three **extracapsular** ligaments. They act to stabilise the temporomandibular joint.
- **Lateral ligament** – runs from the beginning of the articular tubule to the mandibular neck. It is a thickening of the joint capsule, and acts to prevent posterior dislocation of the joint.
- **Sphenomandibular ligament** – originates from the sphenoid spine, and attaches to the mandible.
- **Stylomandibular ligament** – a thickening of the fascia of the parotid gland. Along with the facial muscles, it supports the weight of the jaw.

TMJ

Articulating Surface





TMJ

Movements

Movements at this joint are produced by the muscles of mastication, and the hyoid muscles. The two divisions of the temporomandibular joint have different functions.

Protrusion and Retraction

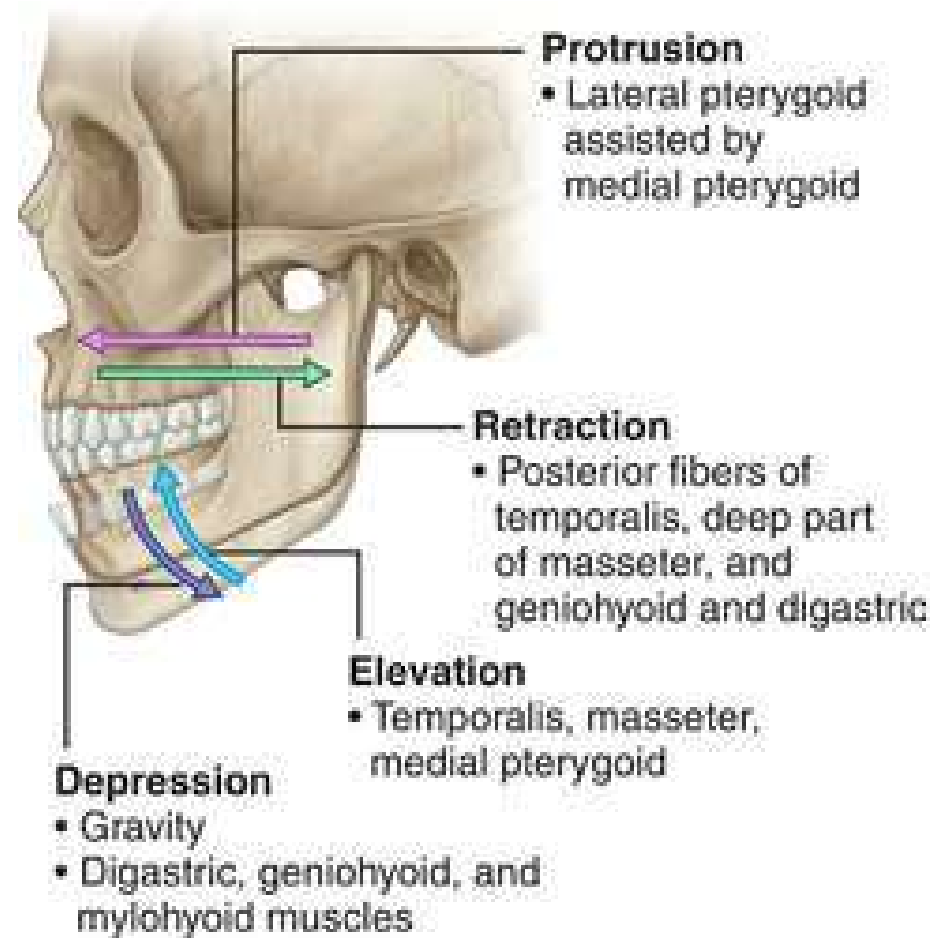
- The upper part of the joint allows **protrusion and retraction** of the mandible – the anterior and posterior movements of the jaw.
- The **lateral pterygoid muscle** is responsible for protrusion (assisted by the medial pterygoid), and the posterior fibres of the temporalis perform retraction. A lateral movement (i.e. for chewing and grinding) is achieved by alternately protruding and retracting the mandible on each side.

Elevation and Depression

- The lower part of the joint permits elevation and depression of the mandible; opening and closing the mouth. Depression is mostly caused by **gravity**. However, if there is resistance, the digastric, geniohyoid, and mylohyoid muscles assist. Elevation is very **strong** movement, caused by the contraction of the temporalis, masseter, and medial pterygoid muscles.

TMJ

Movements





TMJ

Neurovascular supply

- The arterial supply to the TMJ is provided by the branches of the **External carotid**, principally the **Superficial temporal branch**. Other contributing branches include the deep auricular, ascending pharyngeal and maxillary arteries.
- The TMJ is innervated by the **Auriculotemporal** and **Masseteric** branches of the mandibular nerve (CN V3).



TMJ

Clinical Relevance: Disorders of the Temporomandibular Joint

Dislocation

- A **dislocation** of the temporomandibular joint can occur via a blow to the side of the face, yawning, or taking a large bite. The head of the mandible 'slips' out of the mandibular fossa, and is pulled anteriorly.
- The patient becomes unable to close their mouth. The facial and **auriculotemporal nerves** run close to the joint, and can be damaged if the injury is traumatic.
- **Posterior dislocations** of the TMJ are possible, but very rare, requiring a large amount of force to overcome the postglenoid tubercle and strong intrinsic lateral ligament.

Arthritis

- Arthritis can cause inflammation of the temporomandibular joint. Patients commonly complain of jaw pain, stiffness and joint 'grating'.