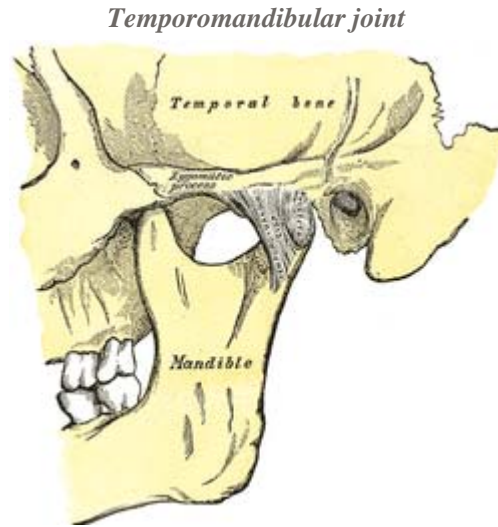


Temporomandibular joint

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Articulation of the mandible. Lateral aspect.

Gray's subject #75 (<http://education.yahoo.com/reference/gray/subjects/subject?id=75#p>)

MeSH A02.835.583.861 (http://www.nlm.nih.gov/cgi/mesh/2006/MB_cgi?mode=&term=Temporomandibular+Joint&field=entry#T)

The **temporomandibular joint** (**TMJ**) is a diarthrosis joint that connects the mandible (lower jaw) to the temporal bone at the side of a skull. As a modified hinge joint, not only does the TMJ enable the jaw to open and close, it also enables the jaw to move forward and backward, as well as laterally.

This is a ginglymo-arthrodial joint; the parts entering into its formation on either side are: the anterior part of the mandibular fossa of the temporal bone and the articular tubercle above; and the condyle of the mandible below.

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Ligaments

The ligaments of the joint are the following:

- Articular capsule
- Sphenomandibular ligament
- Temporomandibular ligament
- Articular disk
- Stylomandibular ligament

Disorders

Classification of disorders involving the temporomandibular joint involve six categories. First, disorders can be described as *functional disturbances*, which is also called temporomandibular joint disorder (TMJD), myofascial pain dysfunction syndrome (MPDS), TMJ pain dysfunction syndrome, or mandibular dysfunction. This disorder is marked by an acute or chronic inflammation of the temporomandibular joint. Second, disorders of the temporomandibular joint can manifest as *organic disease entities*. These include osteoarthritis, rheumatoid arthritis, psoriatic arthritis, and infectious arthritis. Third, there can be *ankylosis* ("fusion") of various structures of the joint. Subcategories of ankylosis include fibrous and bony ankylosis. Fourth, *trauma* to the temporomandibular joint can result in fractures or non-fractures. Fifth, disorders can result from the condylar head of the mandible being trapped anterior to its correct location and thus are referred to as *dislocations*. A dislocation may be chronic or acute. Sixth, disorders of the temporomandibular joint may include *tumors*, though this occurs very rarely. Tumors may express in the form of osteomas, osteochondromas, soft tissue invasions, or metastasis from a different tumor in the body.

Treatment

Because the affected tissues are not serviced by a direct source of rich blood, once the joint tissues are damaged, they stay that way for a long time. This makes the treatment of TMJ difficult. Although there is no known cure for TMJD, there are many dentists who specialize in the management of this disorder.

Nerves and arteries

The nerves of the temporomandibular joint are derived from the auriculotemporal and masseteric branches of the mandibular nerve, the arteries from the superficial temporal branch of the external carotid.

The specific mechanics of proprioception in the temporomandibular joint involve four receptors. Ruffini endings function as static mechanoreceptors which deal with the posture of the mandible. Vater-pacini corpuscles are dynamic mechanoreceptors which accelerate movement during reflexes. Golgi tendons function as static mechanoreceptors for protection of ligaments around the temporomandibular joint. Free nerve endings are the pain receptors for protection of the temporomandibular joint itself.

Movements

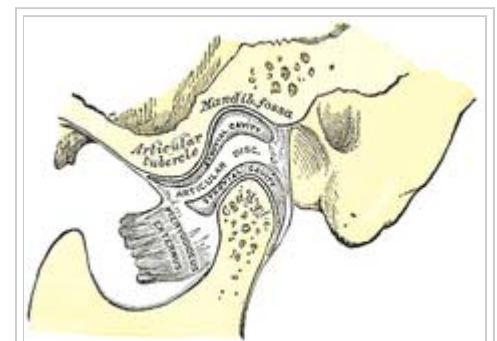
The movements permitted in this articulation are extensive.

Thus, the mandible may be depressed or elevated, or carried forward or backward; a slight amount of side-to-side movement is also permitted.

It must be borne in mind that there are two distinct joints in this articulation—one between the condyle and the articular disc, and another between the disc and the mandibular fossa. When the mouth is but slightly opened, as during ordinary conversation, the movement is confined to the lower of the two joints.

On the other hand, when the mouth is opened more widely, both joints are concerned in the movement; in the lower joint the movement is of a hinge-like character, the condyle moving around a transverse axis on the disc, while in the upper joint the movement is of a gliding character, the disc, together with the condyle, gliding forward on to the articular tubercle, around an axis which passes through the mandibular foramina.

These two movements take place simultaneously, the condyle and disc move forward on the eminence, and at the same time the



Gray's Fig. 311 - Sagittal section of the articulation of the mandible.

condyle revolves on the disc.

In shutting the mouth the reverse action takes place; the disc glides back, carrying the condyle with it, and this at the same time moves back to its former position.

When the mandible is carried horizontally forward, as in protruding the lower incisor teeth in front of the upper, the movement takes place principally in the upper joint, the disc and the condyle gliding forward on the mandibular fossa and articular tubercle.

The grinding or chewing movement is produced by one condyle, with its disc, gliding alternately forward and backward, while the other condyle moves simultaneously in the opposite direction; at the same time the condyle undergoes a vertical rotation on the disc.

One condyle advances and rotates, the other condyle recedes and rotates, in alternate succession.

The mandible is depressed by its own weight, assisted by the Platysma, the Digastricus, the Mylohyoideus, and the Geniohyoideus.

It is elevated by the Masseter, Medial Pterygoid, and the anterior part of the Temporalis.

It is drawn forward by the simultaneous action of the Medial Pterygoid and externus, the superficial fibers of the Masseter and the anterior fibers of the Temporalis; and backward by the deep fibers of the Masseter and the posterior fibers of the Temporalis.

The grinding movement is caused by the alternate action of the Medial Pterygoid muscles of either side.

See also

- Joint
- Mastication
- Temporomandibular joint disorder

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Major Joints

Vertebral column: atlanto-axial - atlanto-occipital - **temporomandibular** - sternocostal - sacroiliac

Upper extremity: sternoclavicular - acromioclavicular - shoulder - elbow/proximal radioulnar articulation - wrist/distal radioulnar articulation - carpometacarpal - metacarpophalangeal - interphalangeal

Lower extremity: hip - knee - ankle - subtalar - metatarsophalangeal

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