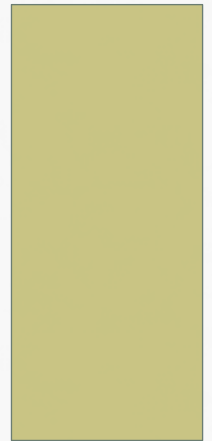


ANATOMY OF THE MANDIBLE

SECOND STAGE

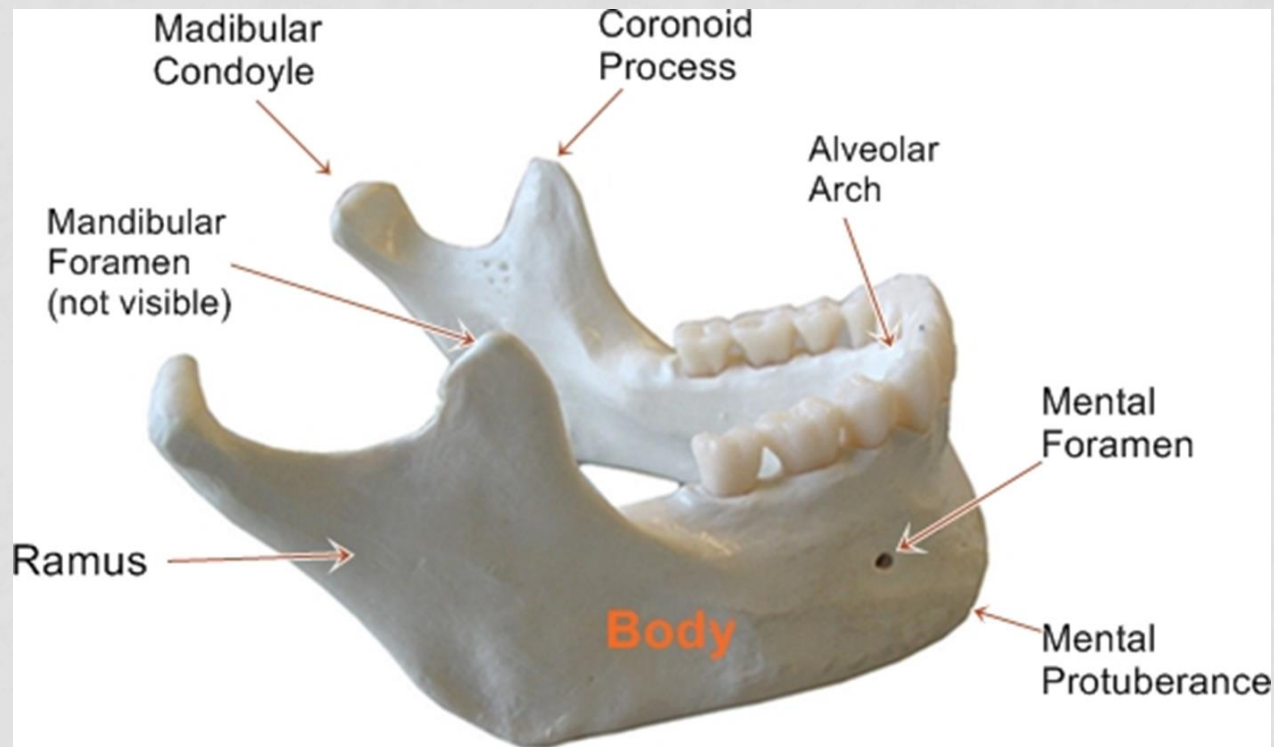
DR. AHMED JASSAM ALNAQEEB

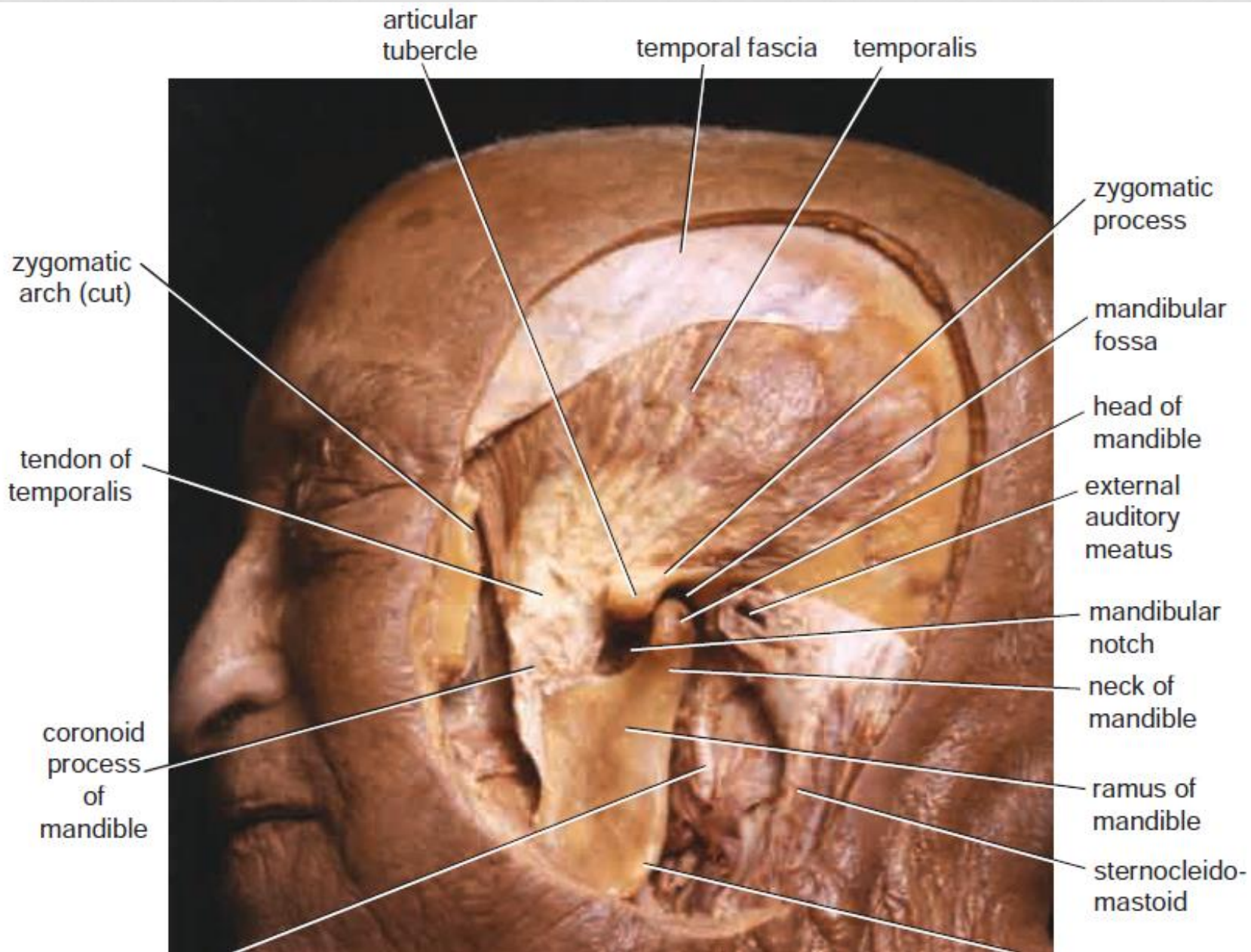
ORAL AND MAXILLOFACIAL SURGEON



THE MANDIBLE

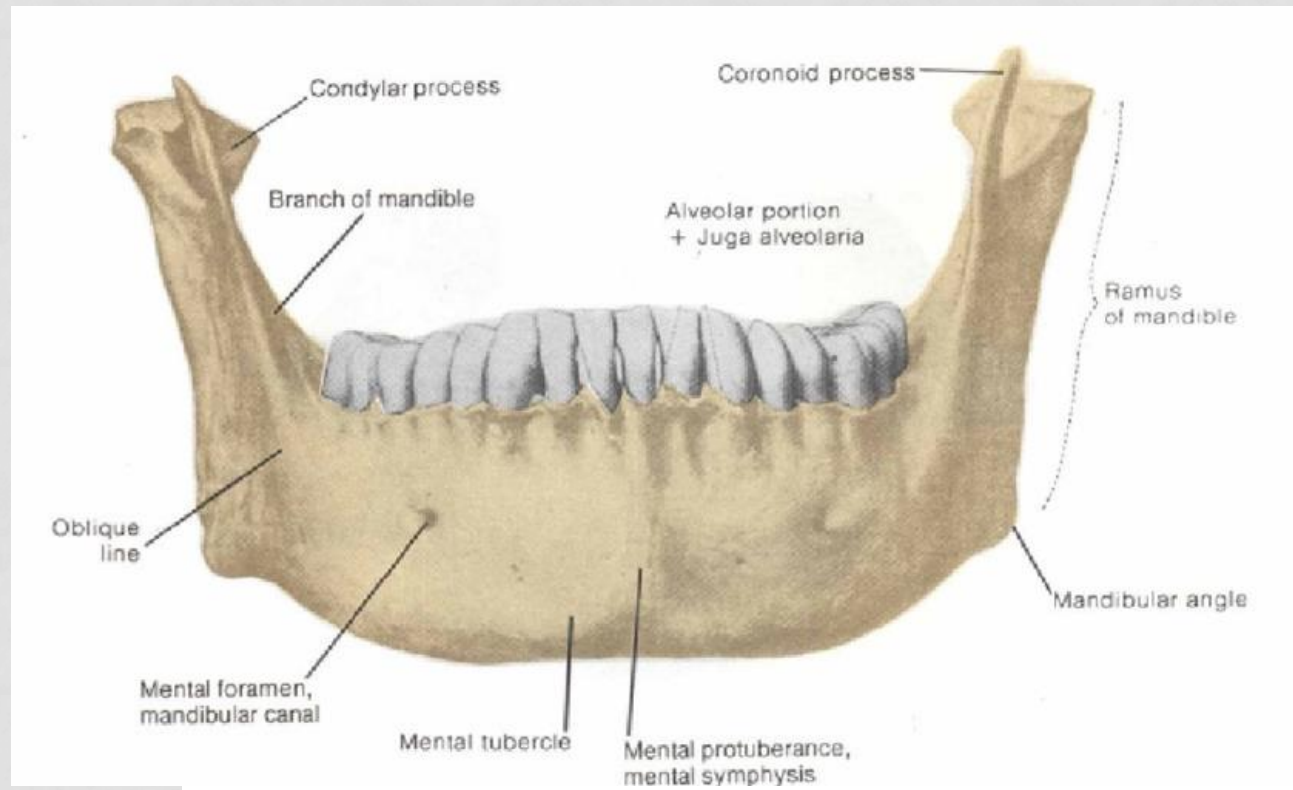
The mandible or lower jaw is *the largest and strongest bone of the face*, and it articulates with the skull at the temporomandibular joint.





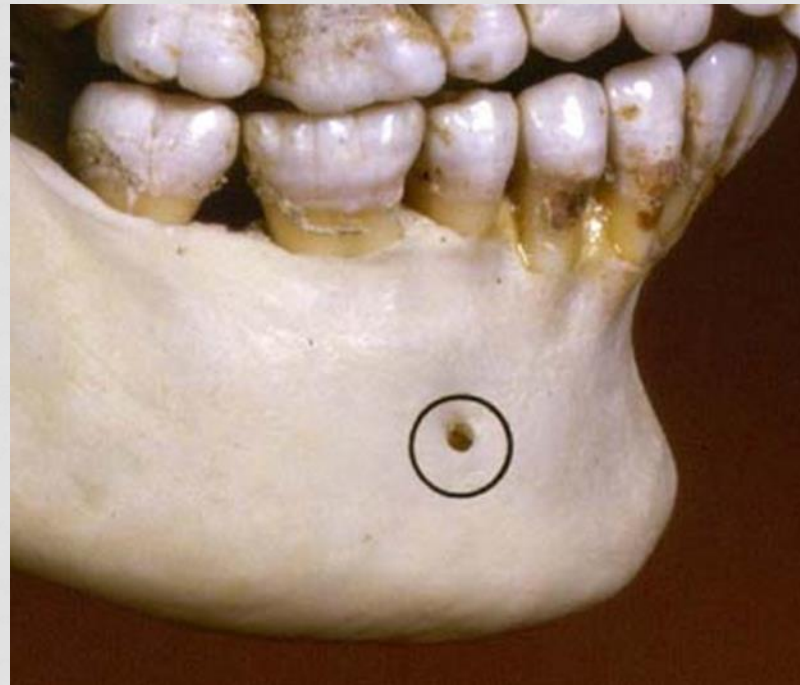
THE MANDIBLE

The body of the mandible, on its external surface in the midline, has a faint ridge, the ***symphysis menti***.



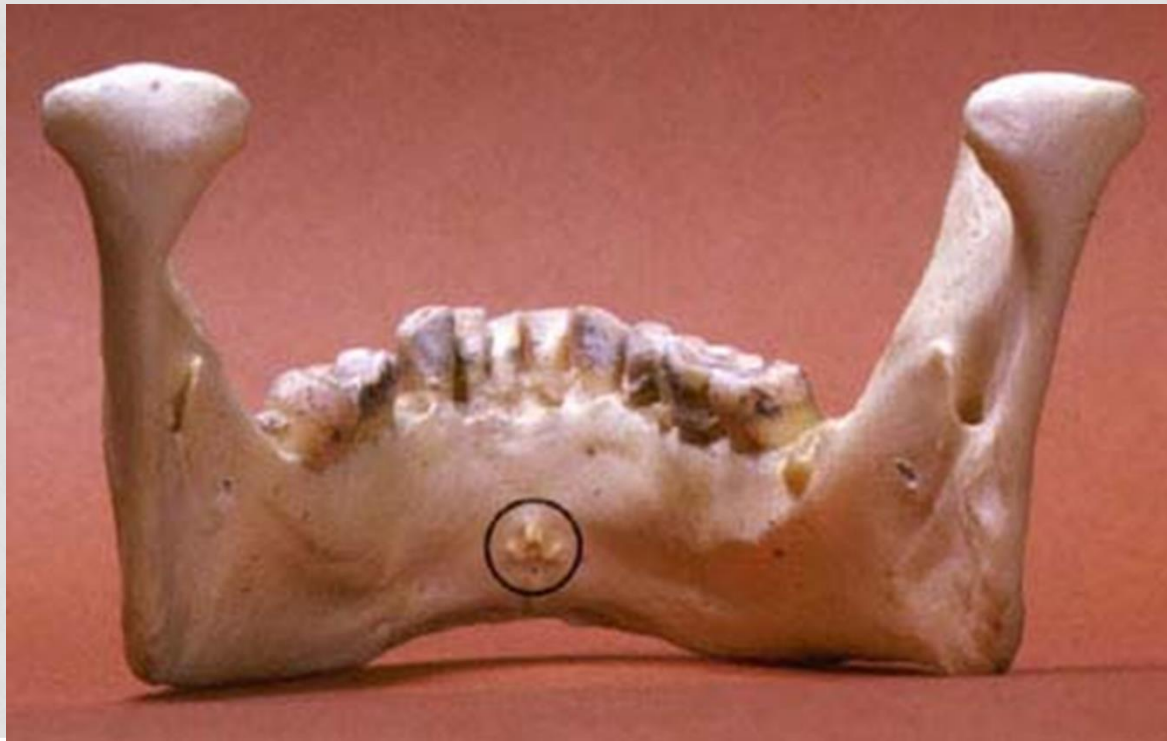
THE MANDIBLE

- The *mental foramen* can be seen below the second premolar tooth; it transmits the terminal branches of the inferior alveolar nerve and vessels.



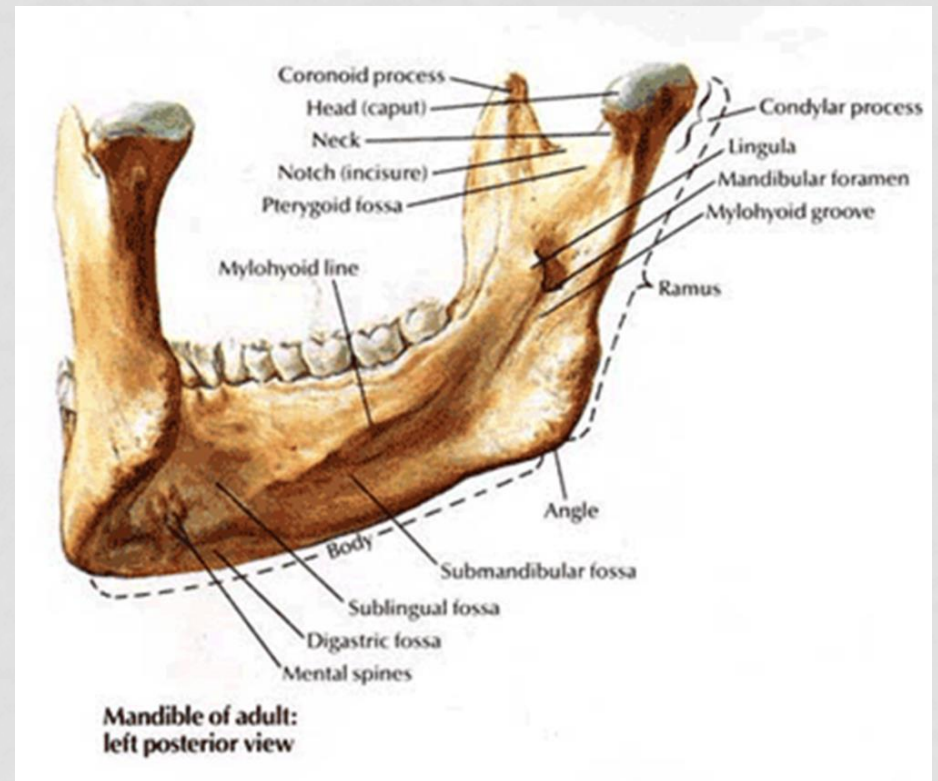
THE MANDIBLE

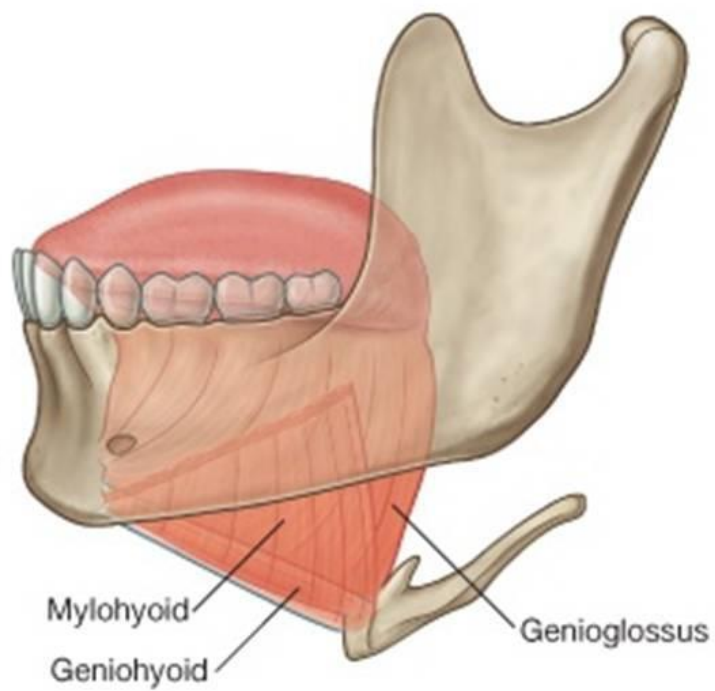
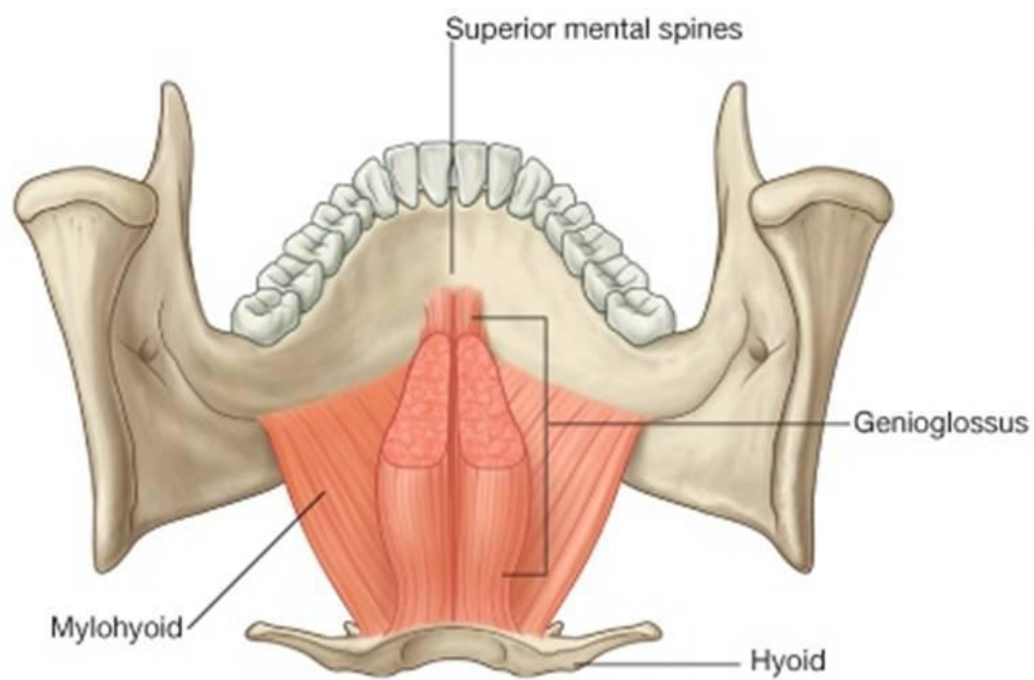
On the medial surface of the body of the mandible in the median plane are seen the *mental spines*; these give origin to the genioglossus muscles above and the geniohyoid muscles below .



THE MANDIBLE

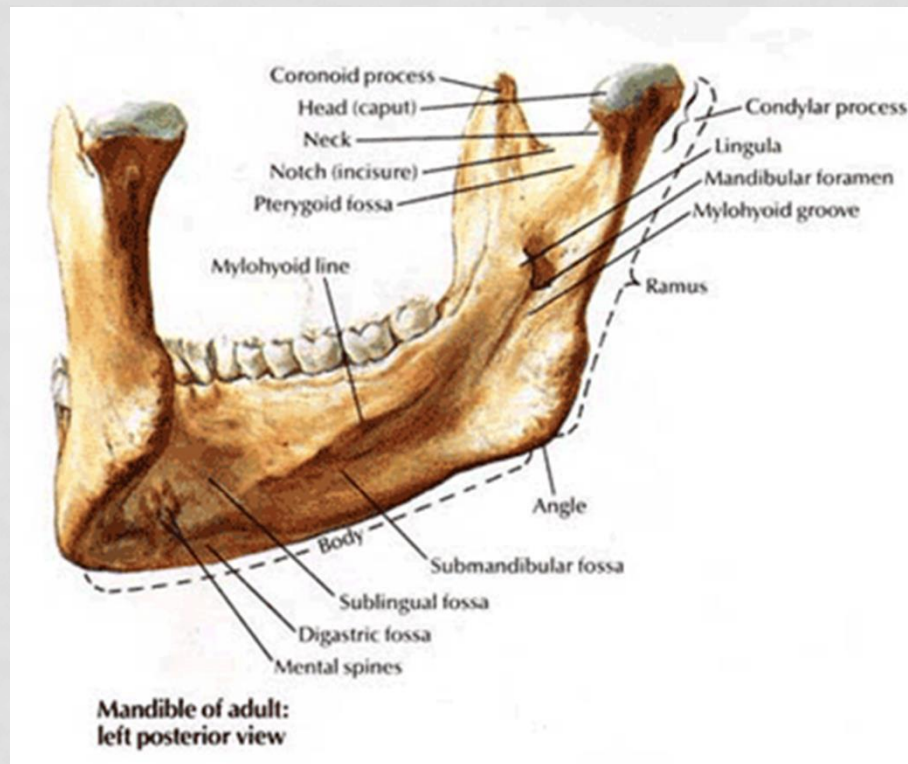
- The *mylohyoid line* can be seen as an oblique ridge that runs backward and laterally from the area of the mental spines to an area below and behind the third molar tooth.





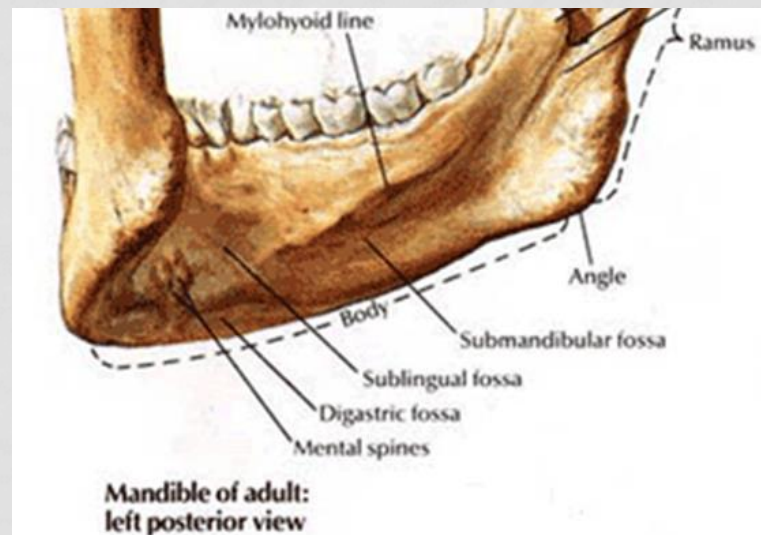
THE MANDIBLE

- ❖ The **submandibular fossa**, for the superficial part of the submandibular salivary gland
- ❖ The **sublingual fossa**, for the sublingual gland



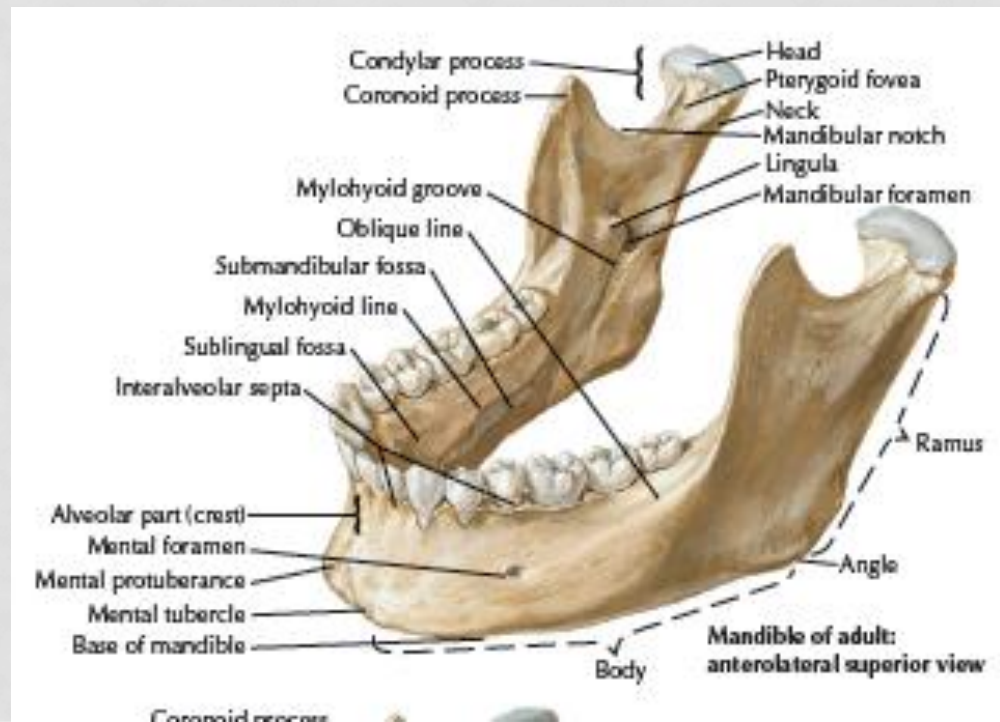
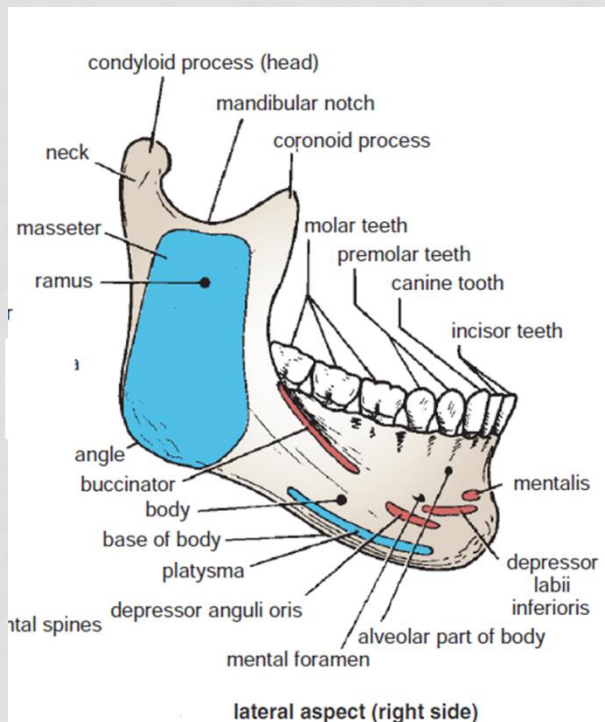
THE MANDIBLE

- ❖ The upper border of the body of the mandible is called the **alveolar part**
- ❖ The lower border of the body of the mandible is called **the base**.
- ❖ The **digastric fossa** is a small, roughened depression on the base, on either side of the symphysis menti .



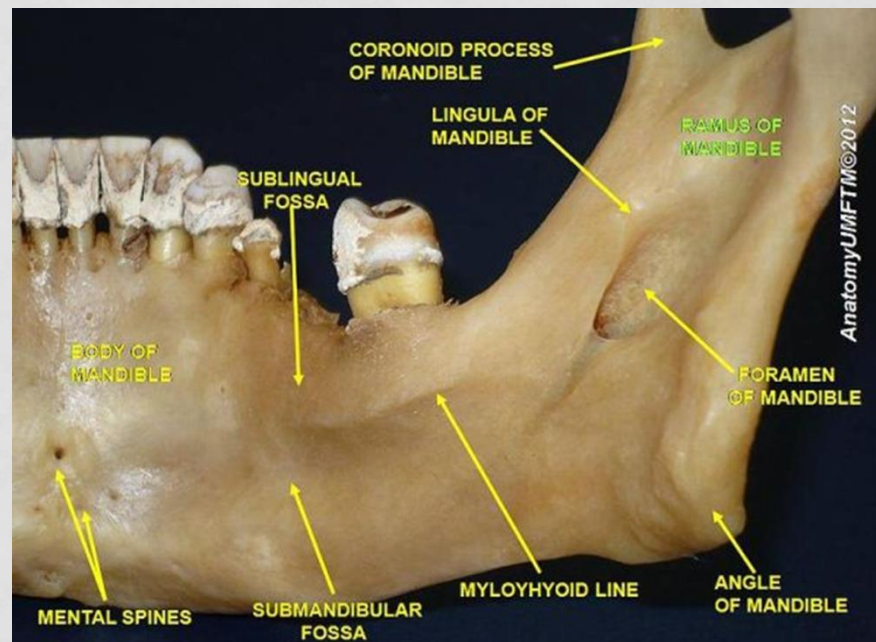
THE MANDIBLE

The *ramus* of the mandible is vertically placed and has an anterior **coronoid** process and a posterior **condyloid** process, or head; the two processes are separated by the **mandibular notch**.

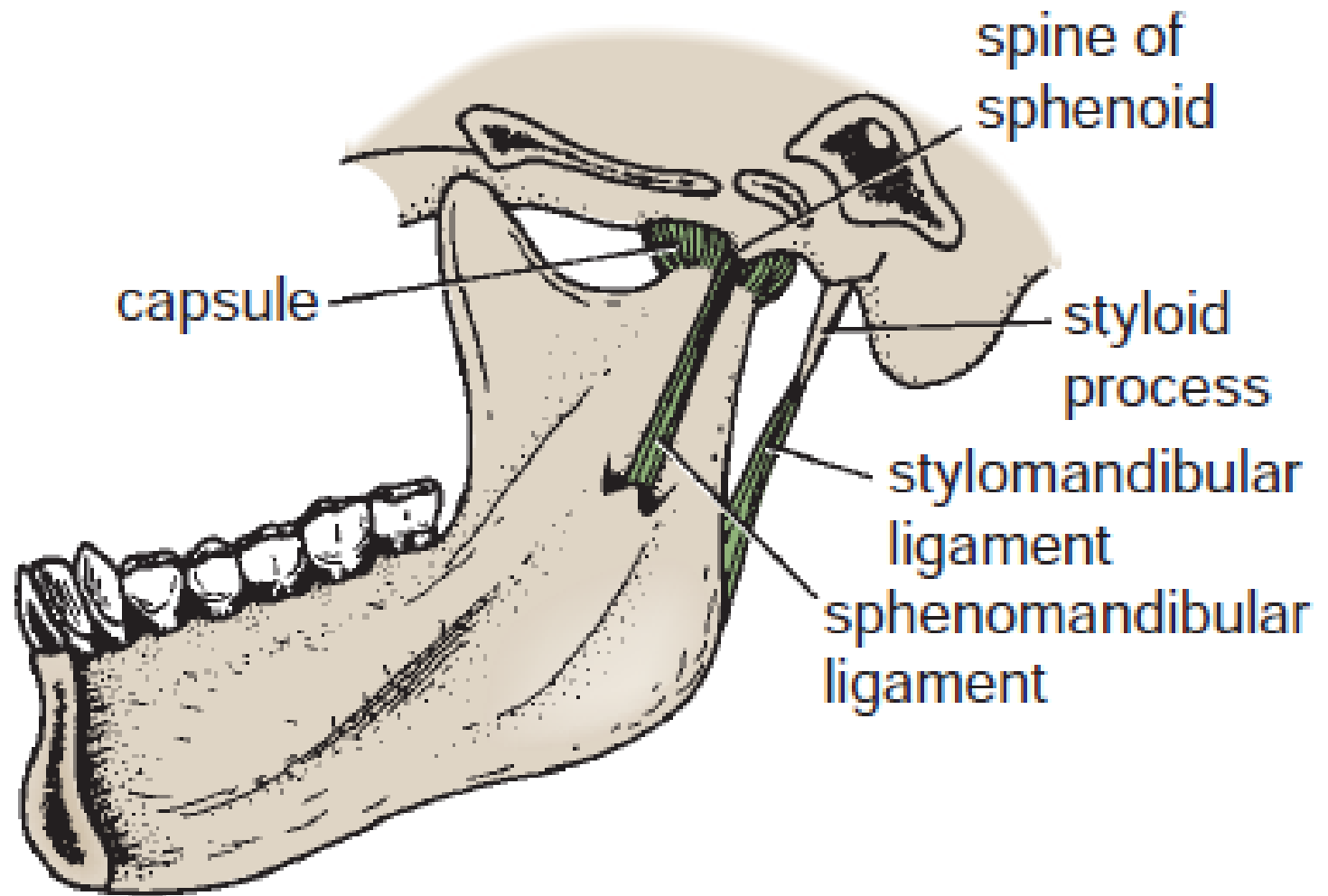


THE MANDIBLE

- On the medial surface is the **mandibular foramen** for the inferior alveolar nerve and vessels
- In front of the foramen is a projection of bone, called the **lingula**, for the attachment of the **sphenomandibular ligament**



A



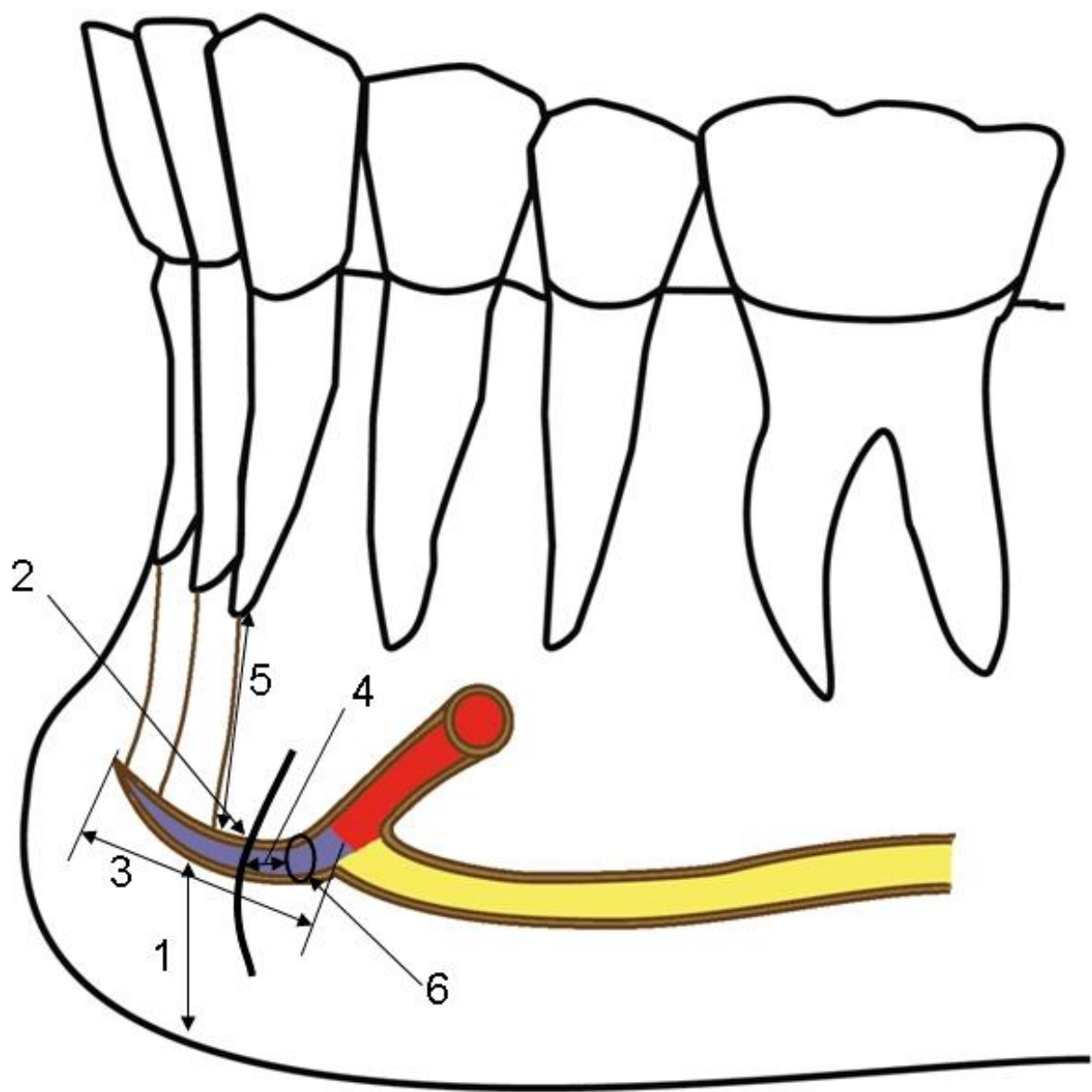
B

64

THE MANDIBLE

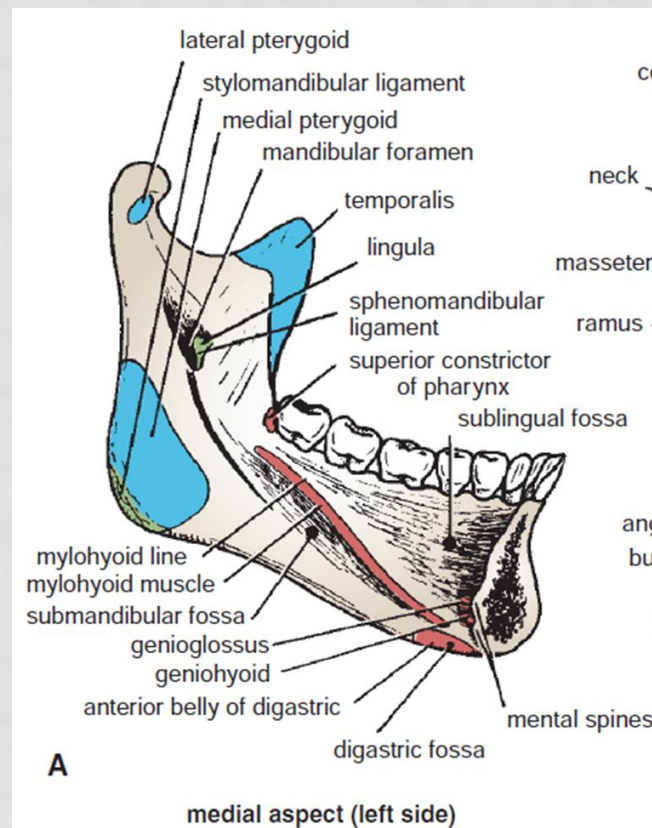
The foramen leads into the *mandibular canal*, which opens on the lateral surface of the body of the mandible at the mental foramen

The *incisive canal* is a continuation forward of the mandibular canal beyond the mental foramen and below the incisor teeth



THE MANDIBLE

The coronoid process receives on its medial surface the attachment of the temporalis muscle.



***TEMPOROMANDIBULAR
JOINT***

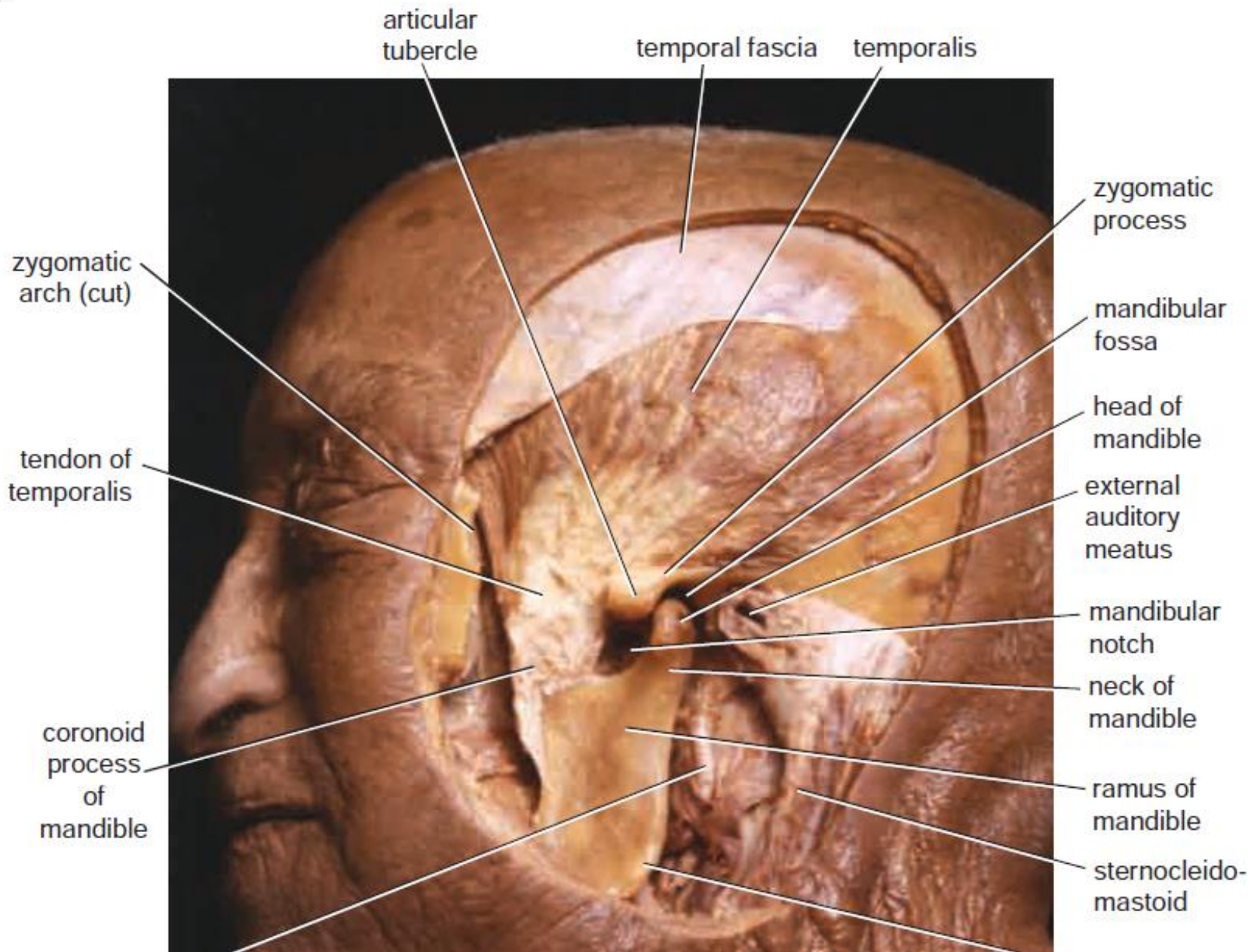


TEMPOROMANDIBULAR JOINT

Articulation

Occurs between the **articular tubercle** and the anterior portion of the **mandibular fossa** of the temporal bone above and the head (condyloid process) of the mandible below.

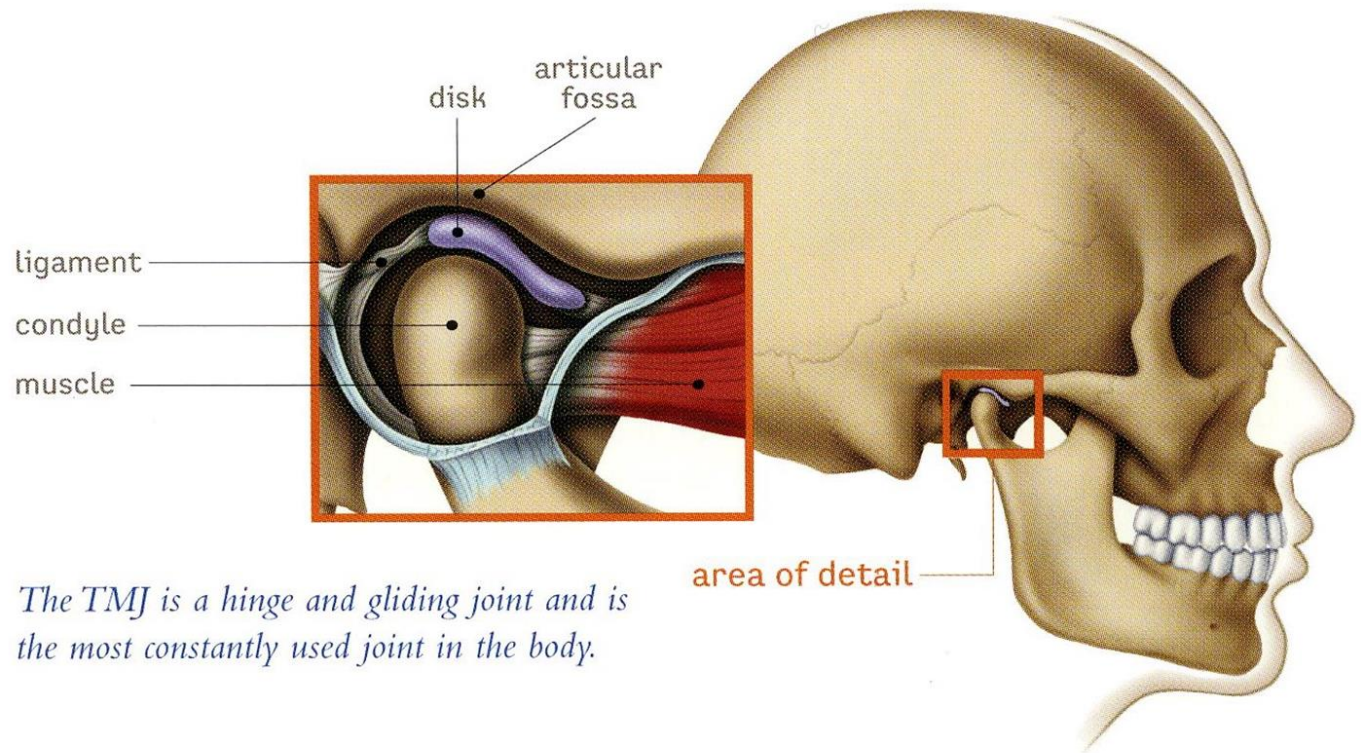
The articular surfaces are covered with fibrocartilage.



TEMPOROMANDIBULAR JOINT

Type of Joint

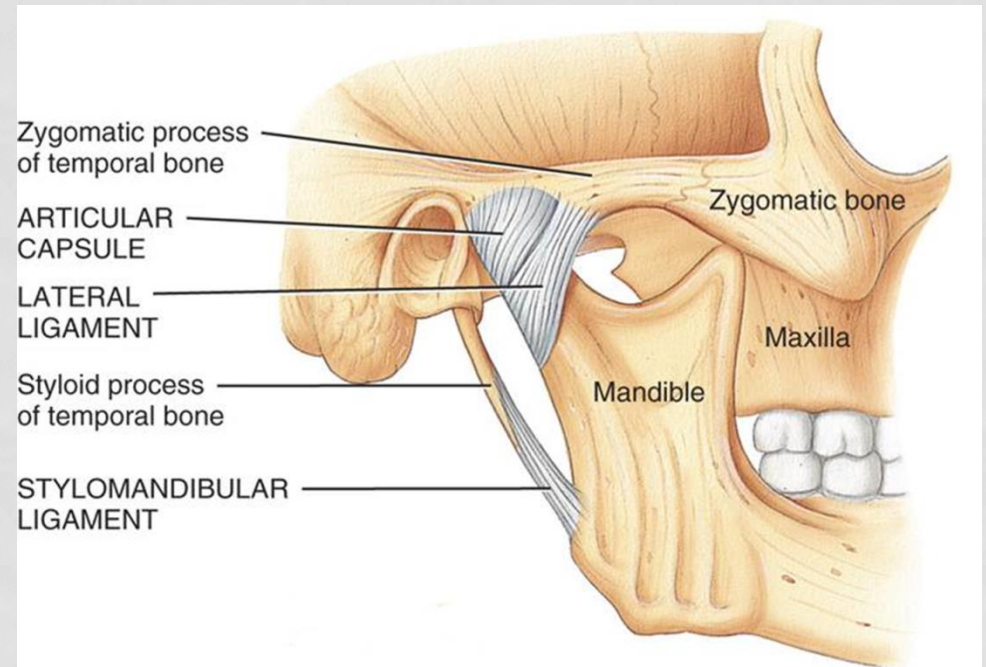
The temporomandibular joint is synovial. The articular disc divides the joint into upper and lower cavities.



TEMPOROMANDIBULAR JOINT

Capsule

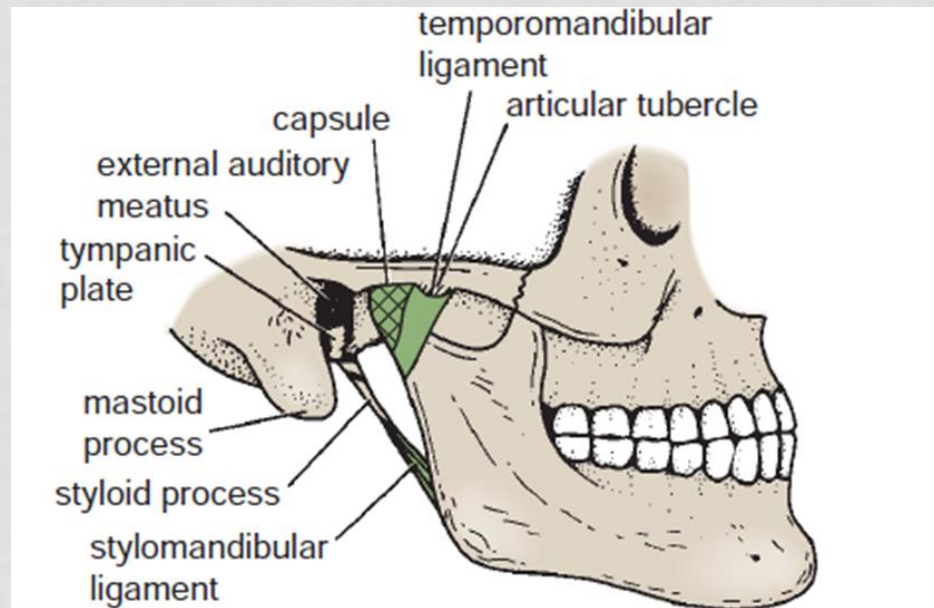
The capsule surrounds the joint and is attached above to the articular tubercle and the margins of the mandibular fossa and below to the neck of the mandible.



TEMPOROMANDIBULAR JOINT

Ligaments

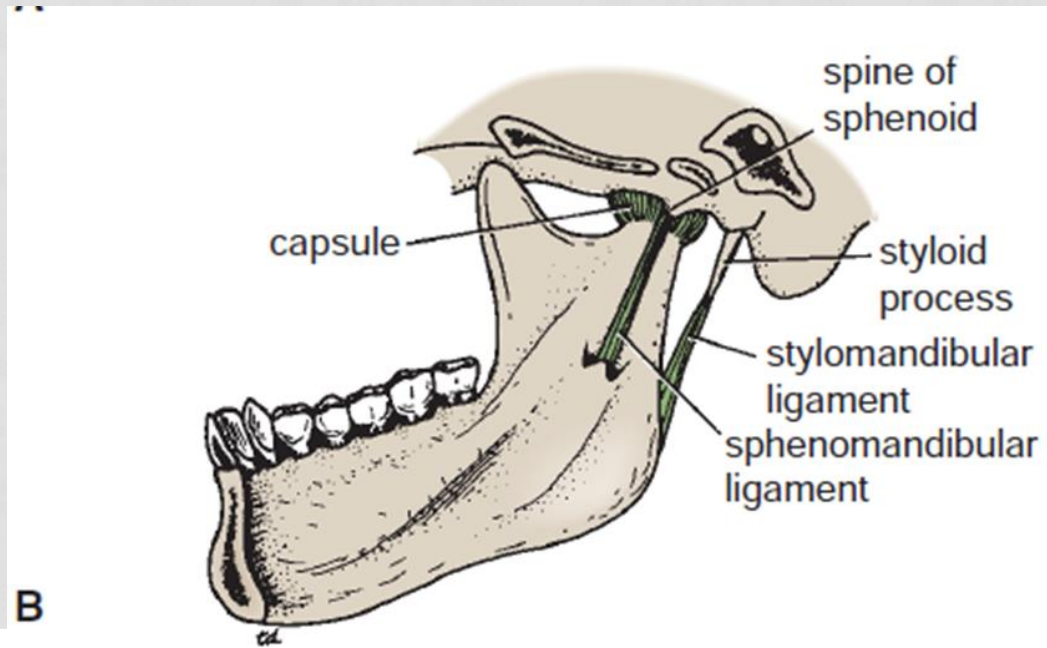
- ❖ **lateral temporomandibular ligament** strengthens the lateral aspect of the capsule
- ❖ This ligament limits the movement of the mandible in a posterior direction



TEMPOROMANDIBULAR JOINT

Ligaments

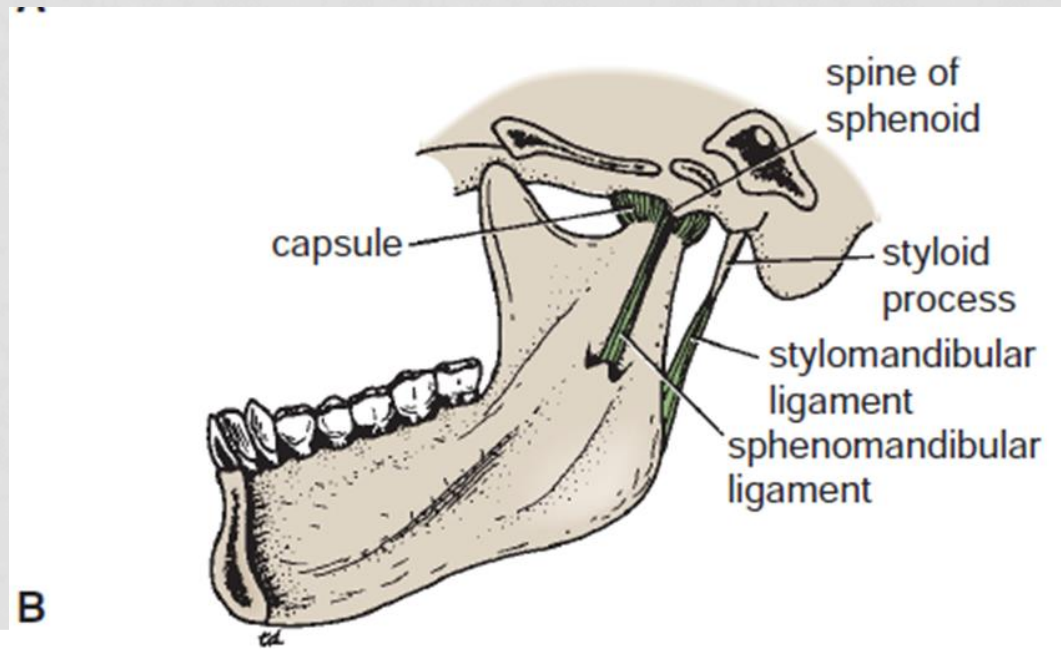
- The **sphenomandibular ligament** a thin band lies on the medial side of the joint
- attached above to the spine of the sphenoid bone and below to the lingula of the mandibular foramen



TEMPOROMANDIBULAR JOINT

Ligaments

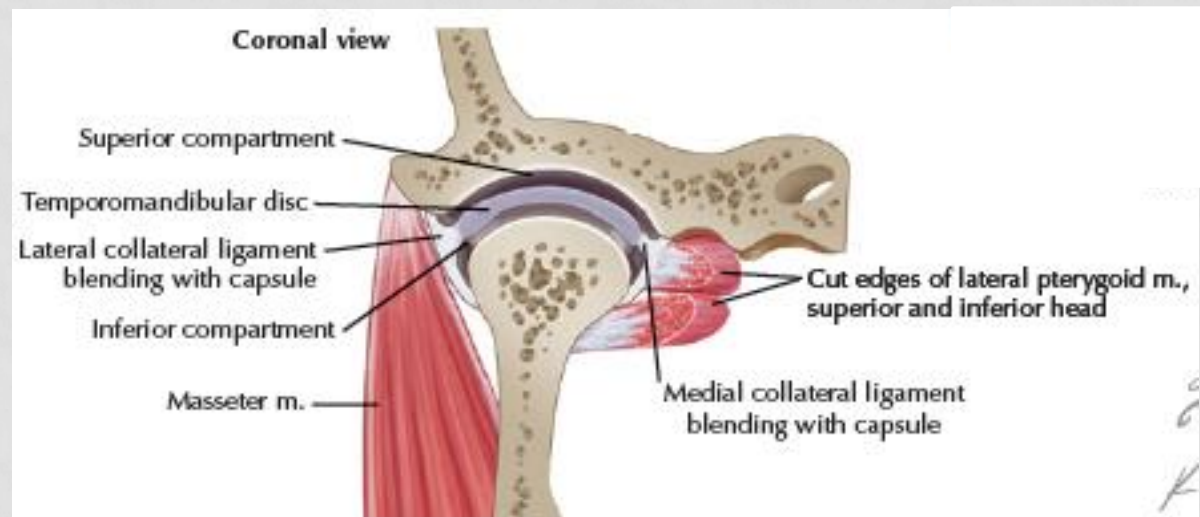
- The **stylomandibular ligament** lies behind and medial to the joint and some distance from it.
- It is a band of thickened deep cervical fascia extends from apex of the styloid process to angle of the mandible



TEMPOROMANDIBULAR JOINT

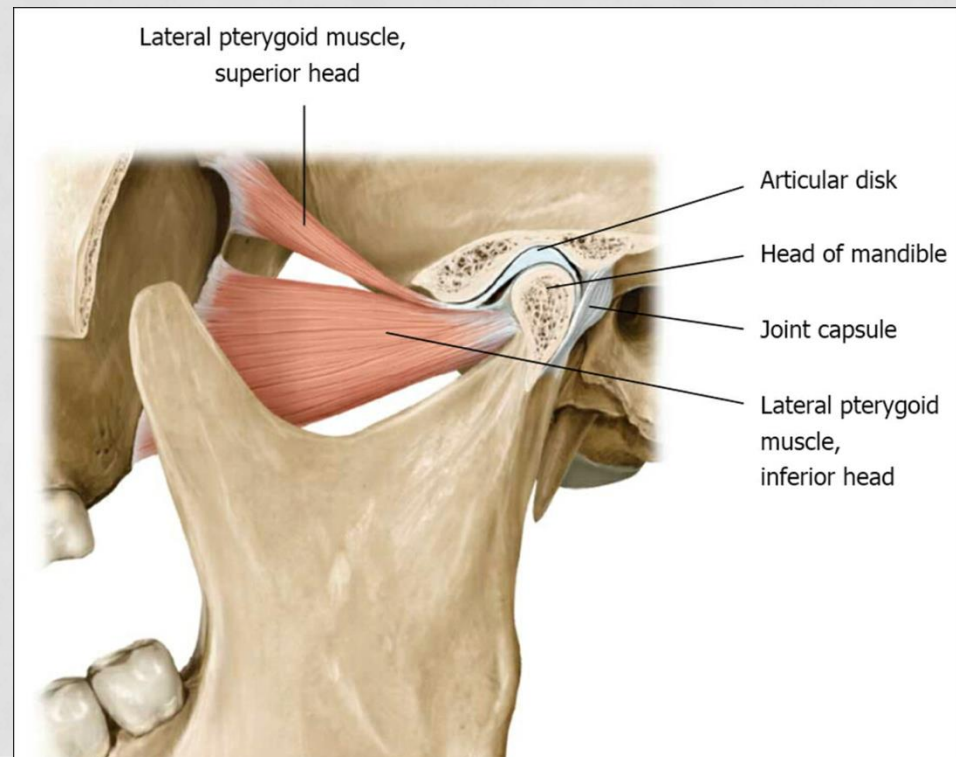
The **articular disc** divides the joint into upper and lower cavities . It is an oval plate of fibrocartilage that is attached circumferentially to the capsule.

It is also attached in front to the tendon of the lateral pterygoid muscle and by fibrous bands to the head of the mandible.



TEMPOROMANDIBULAR JOINT

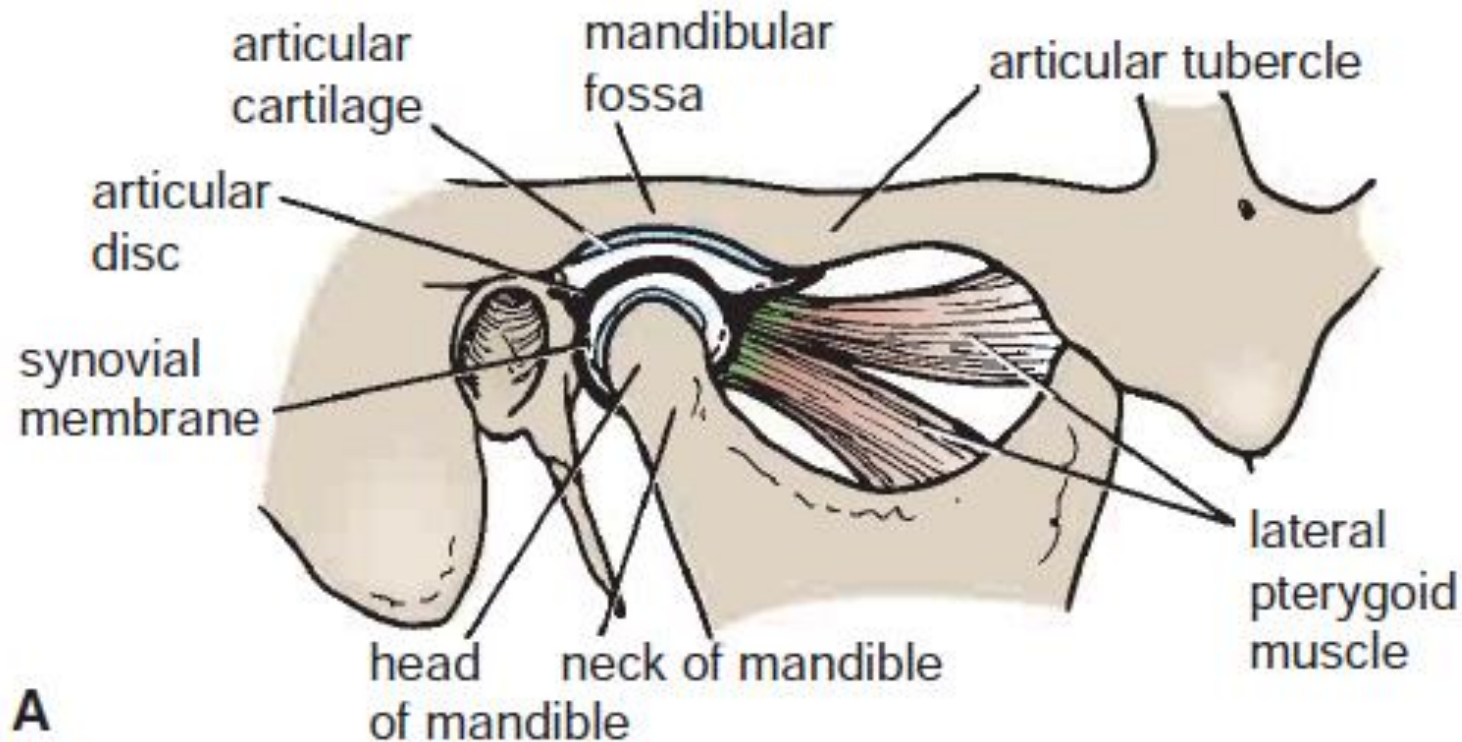
The upper surface of the disc is concavoconvex from before backward to fit the shape of the articular tubercle and the mandibular fossa; the lower surface is concave to fit the head of the mandible.



TEMPOROMANDIBULAR JOINT

Synovial Membrane

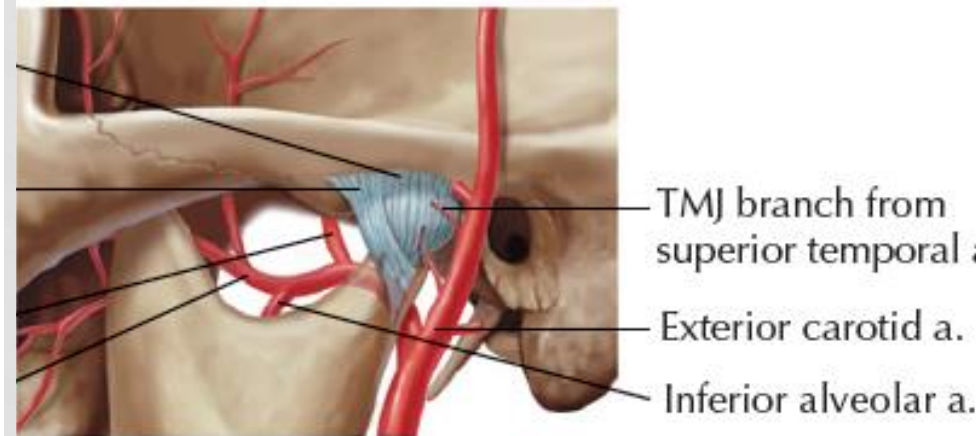
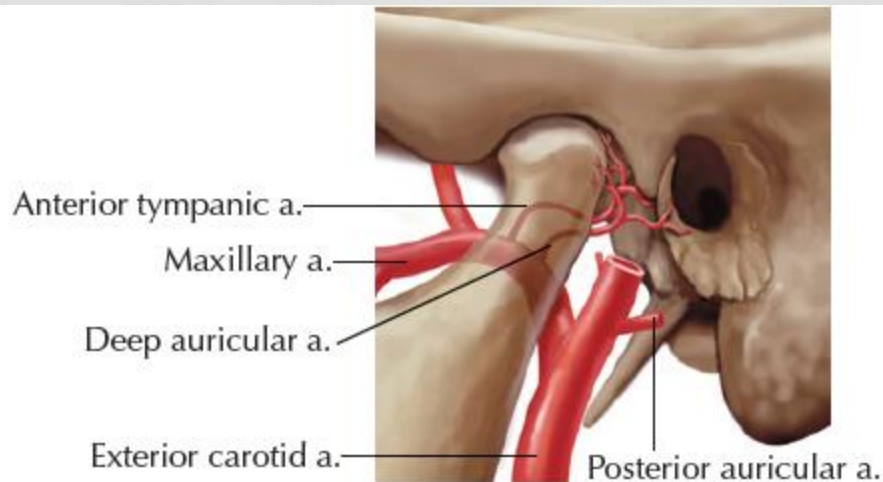
This lines the capsule in the upper and lower cavities of the joint.



TEMPOROMANDIBULAR JOINT

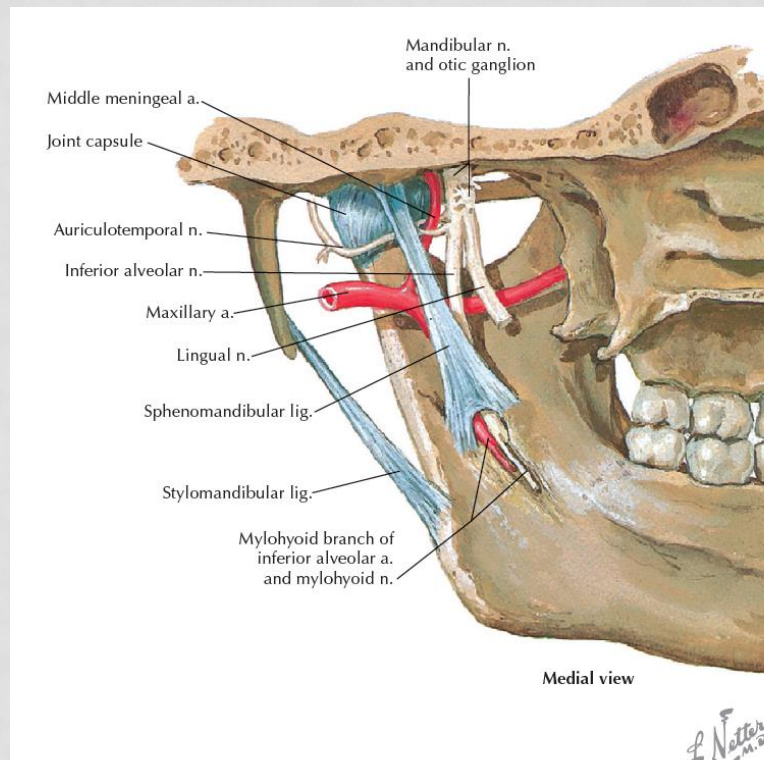
- **Blood supply**

1. Superficial temporal a.
2. Anterior tympanic a.
3. Deep auricular a.



TEMPOROMANDIBULAR JOINT

- Nerve Supply
- Auriculotemporal n.
- Masseteric branch of mandibular nerve



MOVEMENTS OF TMJ



A. Elevation of mandible



B. Depression of mandible

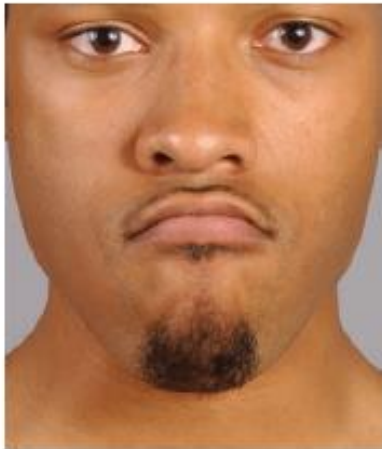


C. Retrusion



D. Protrusion

Lateral Views



E. Protrusion



F. Lateral movement to right side



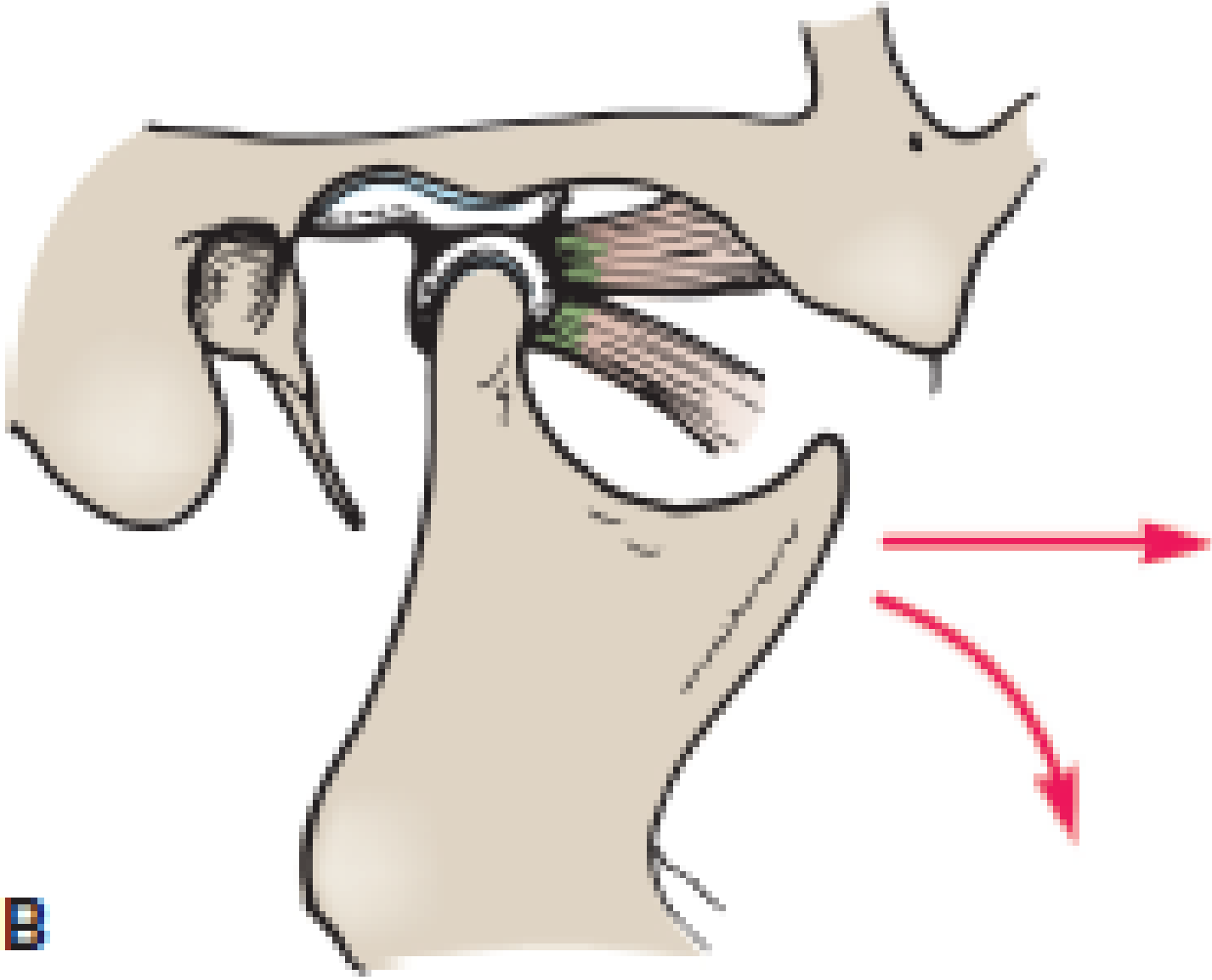
G. Lateral movement to left side

MOVEMENTS OF TMJ

❑ Depression of the Mandible

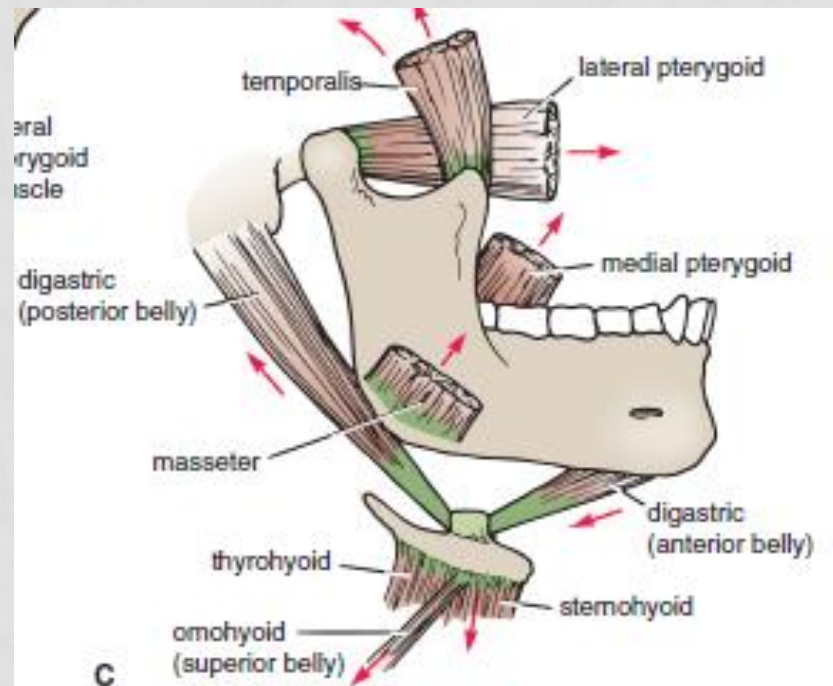
- As the mouth is opened, the head of the mandible rotates on the undersurface of the articular disc around a horizontal axis. To prevent the angle of the jaw impinging unnecessarily on the parotid gland and the sternocleidomastoid muscle, the mandible is pulled forward.





MOVEMENTS OF TMJ

- Depression is brought about by contraction of the digastrics, the geniohyoids, and the mylohyoids; the lateral pterygoids play an important role by pulling the mandible forward



MOVEMENTS OF TMJ

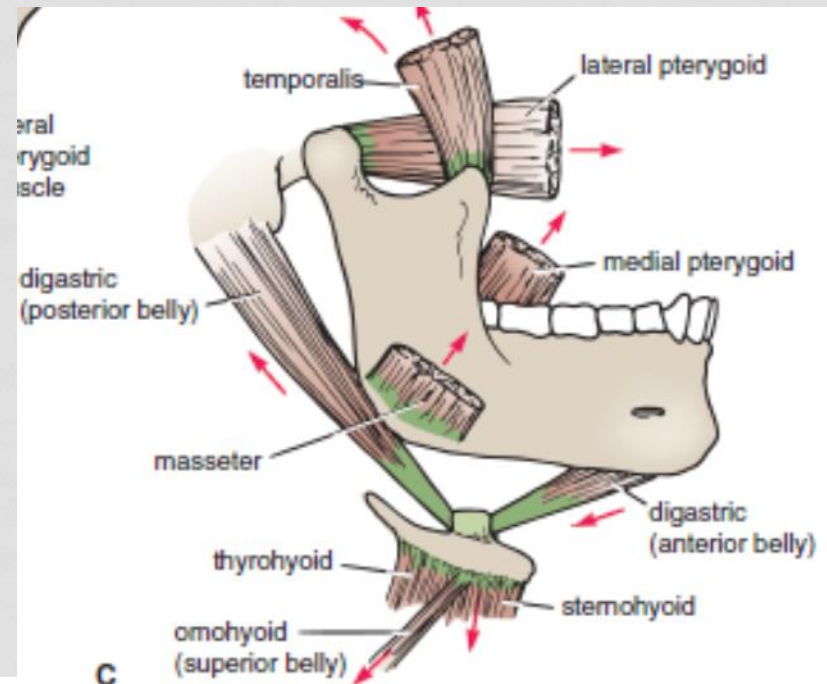
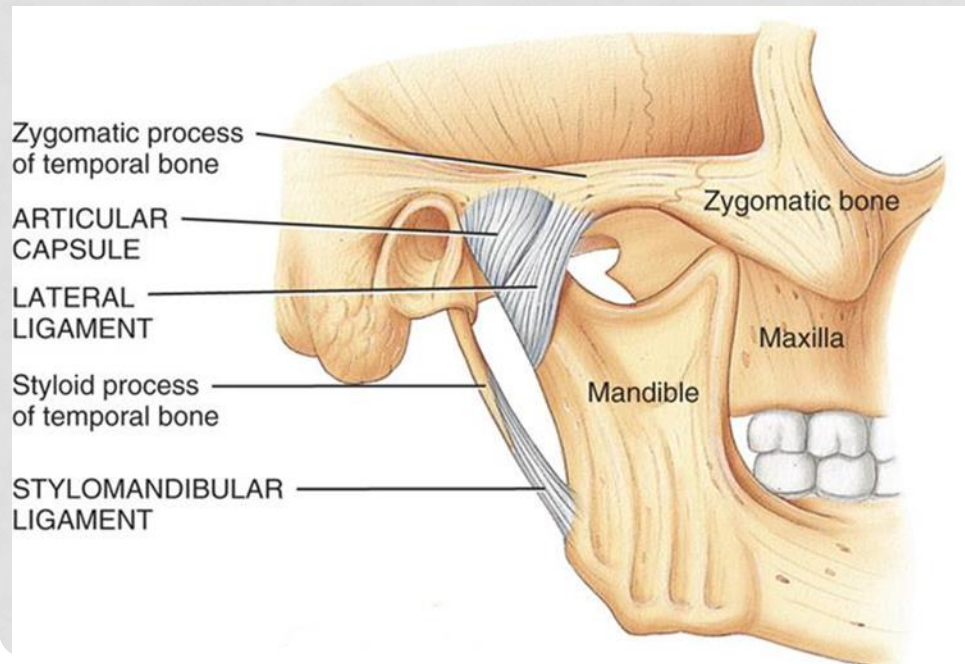
□ Elevation of the Mandible

- The movements in depression of the mandible are reversed.
- First, the head of the mandible and the disc move backward
- then the head rotates on the lower surface of the disc



MOVEMENTS OF TMJ

- Elevation of the mandible is brought about by contraction of the temporalis, the masseter, and the medial pterygoids.
- The articular disc is pulled backward by the fibroelastic tissue



MOVEMENTS OF TMJ

❑ **Protrusion of the Mandible**

- The articular disc is pulled forward onto the anterior tubercle, carrying the head of the mandible with it. All movement thus takes place in the upper cavity of the joint.



MOVEMENTS OF TMJ

❑ Retraction of the Mandible

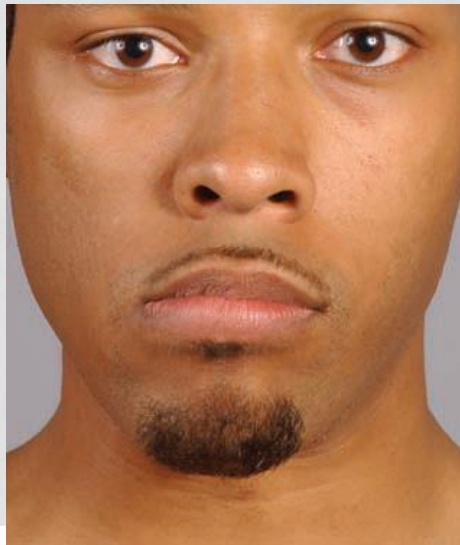
- The articular disc and the head of the mandible are pulled backward into the mandibular fossa.
- Retraction is brought about by contraction of the posterior fibers of the temporalis



MOVEMENTS OF TMJ

❑ Lateral Chewing Movements

- These are accomplished by alternately protruding and retracting the mandible on each side.
- For this to take place, a certain amount of rotation occurs, and the muscles responsible on both sides work alternately



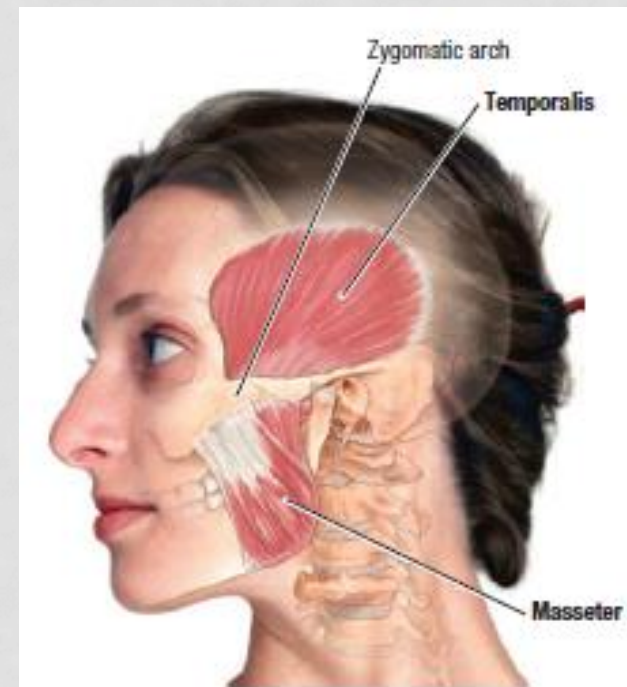
IMPORTANT RELATIONS OF THE TEMPOROMANDIBULAR JOINT

- **Anteriorly:** The mandibular notch and the masseteric nerve and artery
- **Posteriorly:** The tympanic plate of the external auditory meatus and the glenoid process of the parotid gland
- **Laterally:** The parotid gland, fascia, and skin
- **Medially:** The maxillary artery and vein and the auriculotemporal nerve

MUSCLES OF MASTICATION

□ Masseter

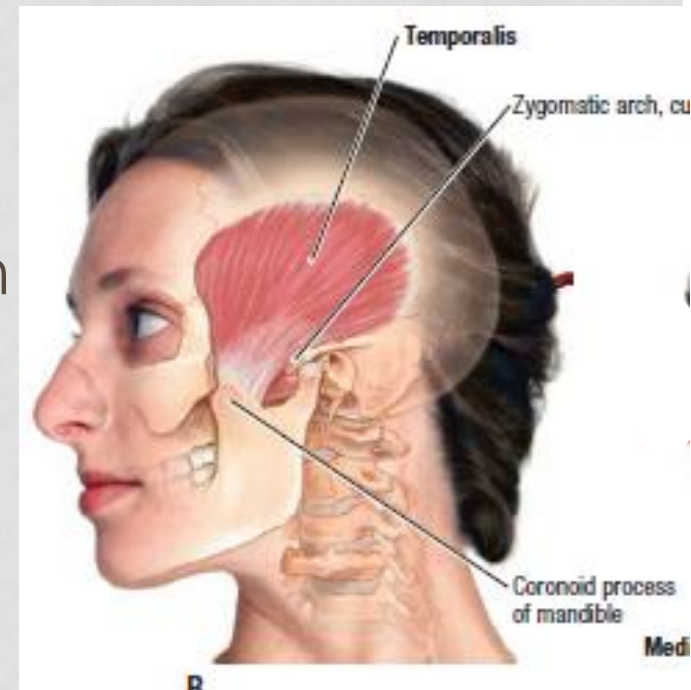
- **Origin:** Zygomatic arch
- **Insertion:** Lateral surface ramus of mandible
- **Nerve supply:** Mandibular division of trigeminal nerve
- **Action:** Elevates mandible to occlude teeth



MUSCLES OF MASTICATION

□ Temporalis

- **Origin:** Floor of temporal fossa
- **Insertion:** Coronoid process of Mandible
- **Nerve supply:** Mandibular division of trigeminal nerve
- **Action:** Anterior and superior fibers elevate mandible; posterior fibers retract mandible



MUSCLES OF MASTICATION

❑ Lateral pterygoid (two heads)

- **Origin:**

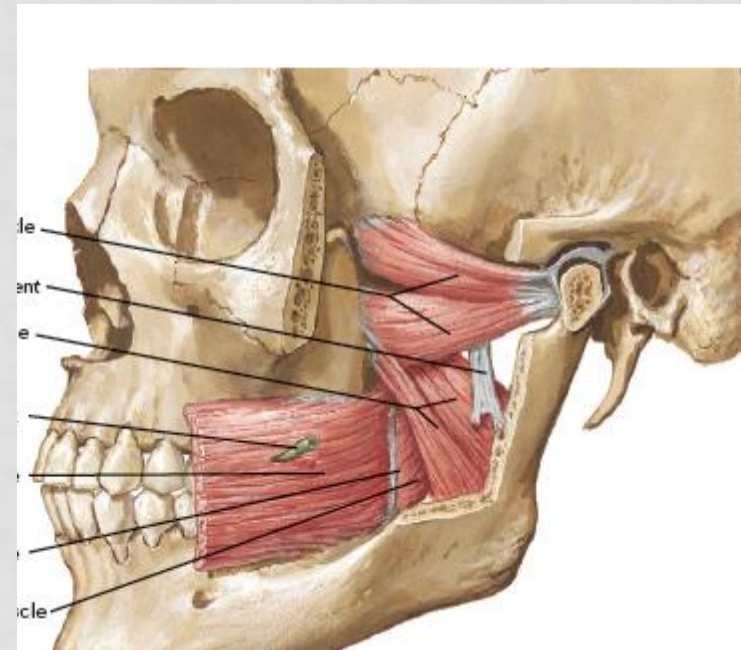
- ❖ Superior head: greater wing of sphenoid

- ❖ Inferior head: lateral aspect of lateral pterygoid plate

- **Insertion:** Neck of mandible and articular disc

- **Nerve supply:** Mandibular division of trigeminal nerve

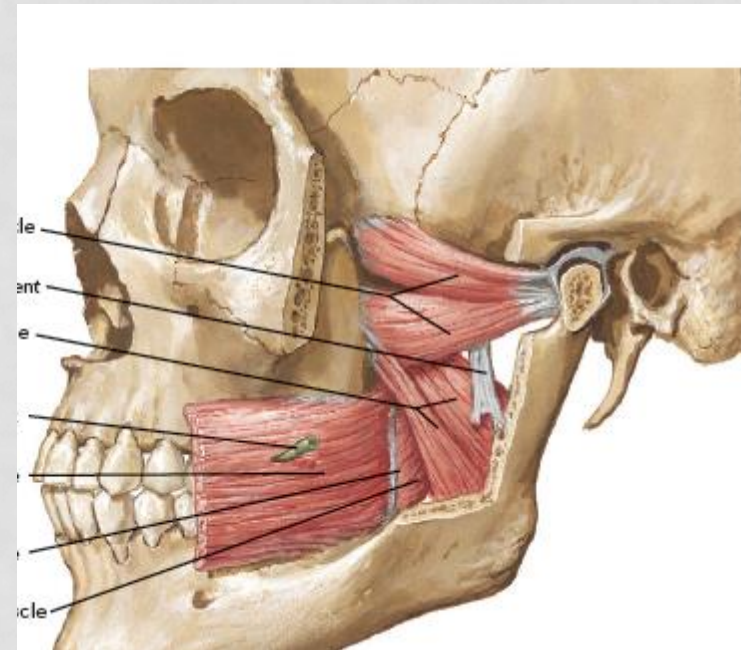
- **Action:** depress mandible; protrude mandible



MUSCLES OF MASTICATION

□ medial pterygoid (two heads)

- **Origin:**
 - ❖ Superficial head: maxillary tuberosity
 - ❖ deep head: medial aspect of lateral pterygoid plate
- **Insertion:** Medial surface of angle of mandible
- **Nerve supply:** Mandibular division of trigeminal nerve
- **Action:** elevate mandible



REFERENCES

- Snell, Richard S. Clinical anatomy by regions. Lippincott Williams & Wilkins, 2011.
- Norton, Neil S. Netter's head and neck anatomy for dentistry e-book. Elsevier Health Sciences, 2016.

Thank
You