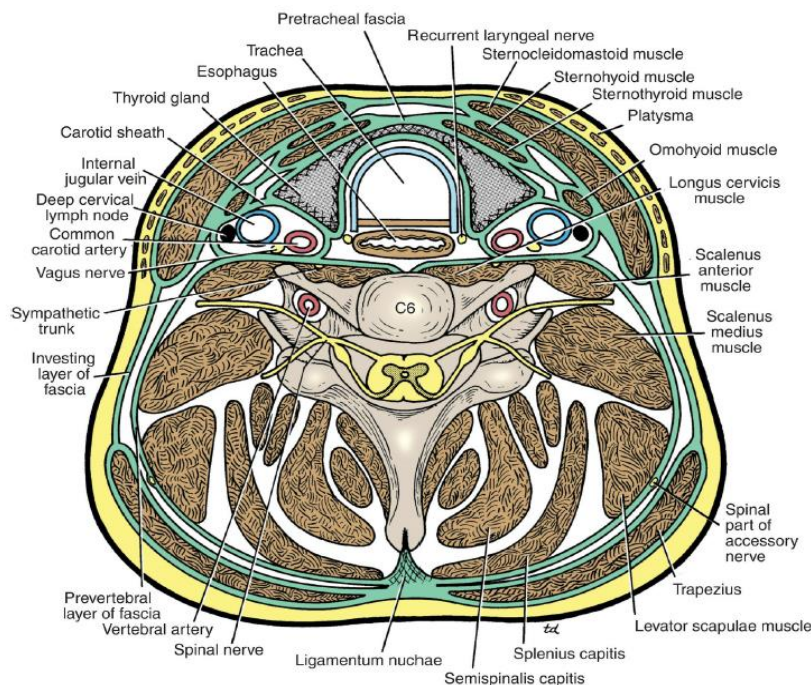


# The Neck/ Part I

## Introduction

- The neck is the region of the body that lies between the lower margin of the mandible from above and the upper border of the clavicle and suprasternal notch from below.
- The skeletal structures of the neck are the cervical part of the vertebral column (which is convex forward and supports the skull) and the Hyoid bone (freely mobile in midline of the anterior neck).
- Behind the vertebrae is a mass of extensor muscles while in front is a smaller group of flexor muscles.
- At the anterior central part of the neck are parts of the respiratory system (the larynx and the trachea) while behind them posteriorly are parts of the alimentary system (the pharynx and the esophagus).

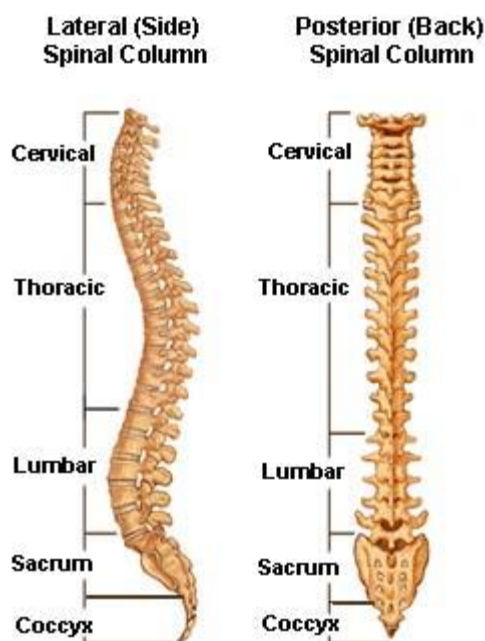


**Cross section of the neck at the level of C6**

- At the sides of the neck are:
  - The vertically running major vessels: carotid arteries, internal jugular veins.
  - The vagus nerve which pass between the two vessels.
  - deep cervical lymph nodes: attached to internal Jugular vein

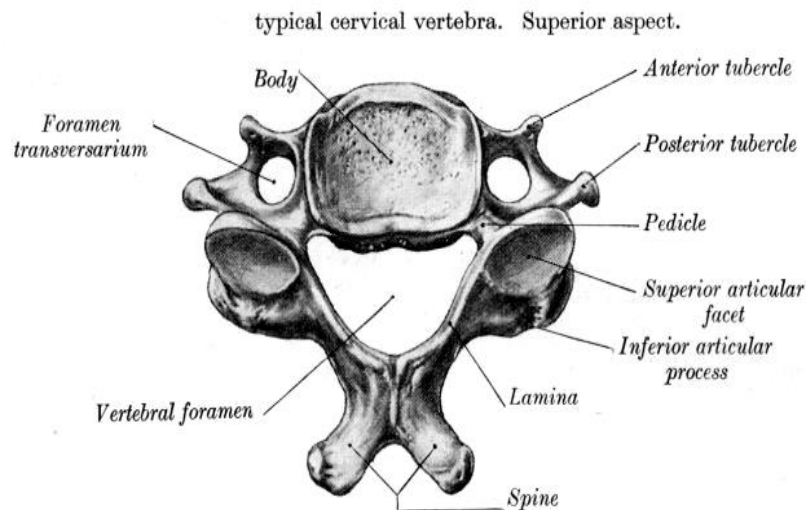
## Cervical Vertebrae

- Cervical vertebrae are part of the vertebral column; the vertebral column is composed of 33 vertebrae organized in five regions—7 cervical, 12 thoracic, 5 lumbar, 5 sacral (fused to form the sacrum), and 4 coccygeal.



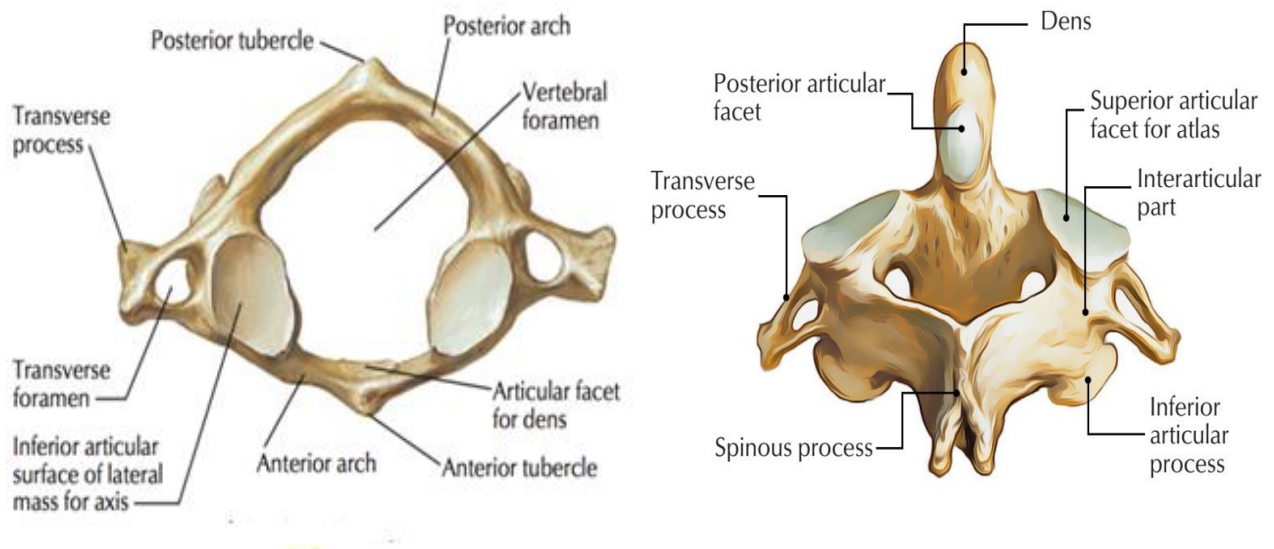
- The **typical** vertebra consists of a rounded body anteriorly and a vertebral arch posteriorly. These enclose a space termed the vertebral foramen, the vertebral foramina forms the spinal canal for the passage of the spinal cord. The vertebral arch gives rise to seven processes: one spinous, two transverse (each one has foramen transversarium for the passage of vertebral artery)

and four articular (two superior and two inferior for articulation with the above and below vertebrae).



- The two superior articular processes of one vertebral arch articulate with the two inferior articular processes of the arch above, forming two synovial joints. Likewise, the two inferior articular processes of the vertebral arch articulate with the two superior articular processes of the arch below, forming two additional synovial joints. Thus, each vertebra possesses a total of four synovial articular joints.
- **Atypical cervical vertebrae are (C1, C2 and C7):**
  - The **first cervical vertebra C1**, or **atlas**, does not possess a body or a spinous process. Instead, it has anterior and posterior arches. Atlas is modified because of its upper surface articulation with the occipital condyles of the skull (atlanto-occipital joints), this joint allows for limited movement as flexion and extension of the head.
  - The **second cervical vertebra**, or **Axis**, has a peglike odontoid process (dens) that projects upward from the superior surface of the body. The superior

articulating surfaces join the inferior articulating surfaces of atlas at atlantoaxial joint, this joint allows for the rotation of the head



**C1**



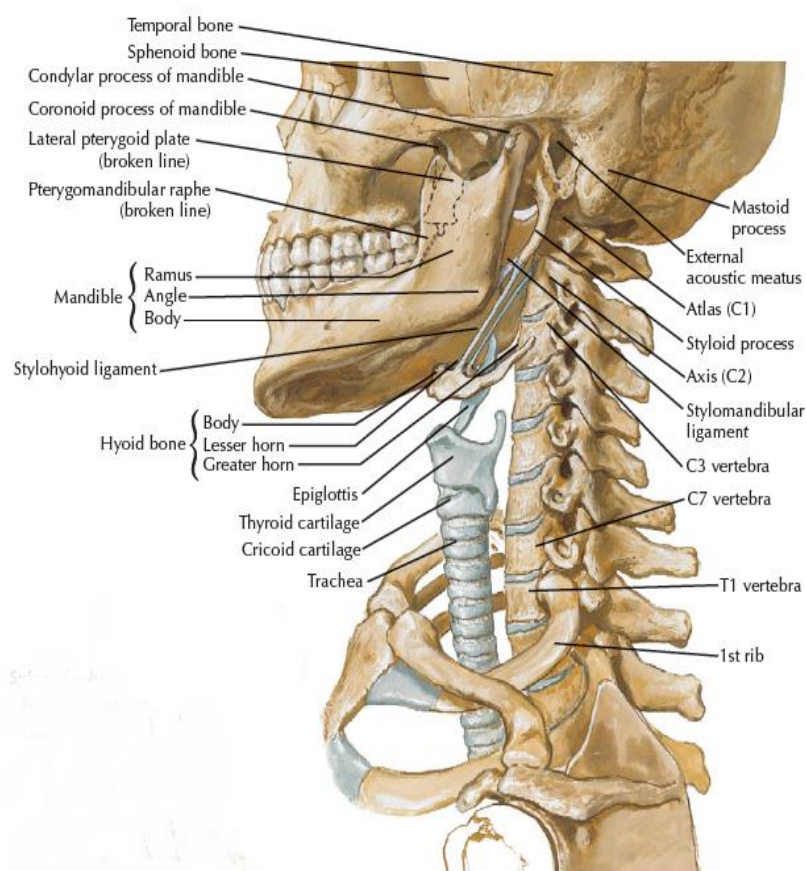
**C2**



- The **seventh cervical vertebra**, or vertebra prominens, is so named because it has the longest spinous process, and the process is not bifid.

## Neck Structures in Relation to the Cervical Vertebrae:

- The **hard palate** lies on the level of C<sub>1</sub> (first cervical vertebra- atlas-)
- The **mandible** lies on the level between C<sub>2</sub> and C<sub>3</sub>
- The **Hyoid bone** lies on the level of C<sub>3</sub>
- The **Thyroid Cartilage** (forms Adams apple in male) lies on the level of C<sub>4</sub>
- The **Cricoid Cartilage** lies on the level of C<sub>6</sub>
- The **Bifurcation of Common Carotid Artery** lies on the level C<sub>3</sub> or C<sub>4</sub>
- The **larynx** lies anterior to the pharynx, begin with thyroid cartilage (C<sub>4</sub>) and ends in the trachea (C<sub>6</sub>) which lies anterior to the esophagus.





## Muscles of the neck

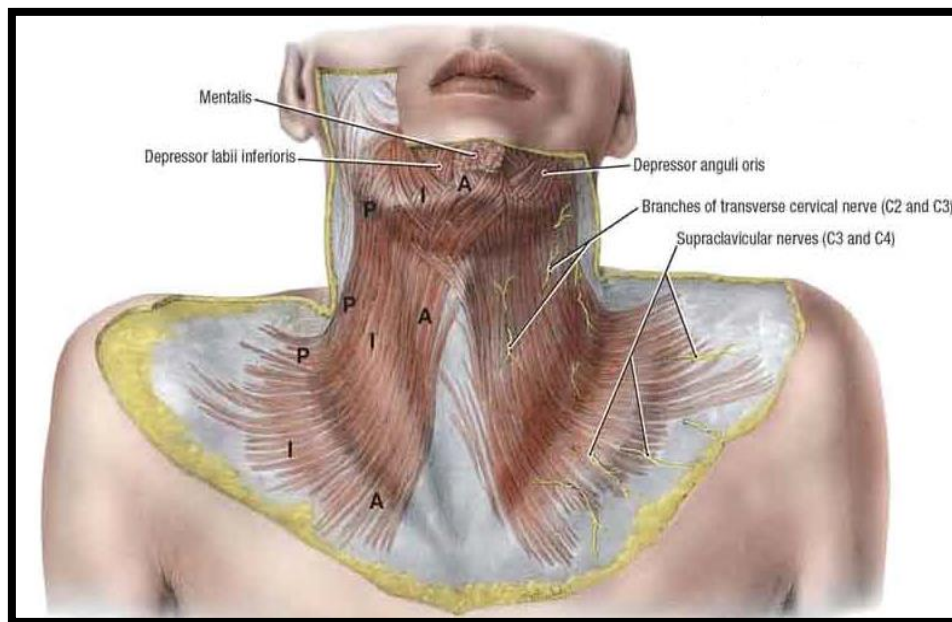
### Platysma

- Origin: from the chest (deep Fascia over the pectoralis major and deltoid)
- Insertion: body of the mandible and angle of the mouth
- Nerve supply: cervical branch of the facial nerve
- Action: depresses the angle of the mouth

The platysma muscle is a thin but clinically important muscular sheet embedded in the superficial fascia, the muscle extends like a collar surround the neck from the body of the mandible downward over the clavicle onto the anterior chest wall.

The muscle can be seen as a thin sheet of muscle just beneath the skin by having the patient clench his or her jaws firmly.

The platysma muscle is innervated by the cervical branch of the facial nerve. This nerve emerges from the lower end of the parotid gland and travels forward to the supply the muscle.



**Platysma muscle**



**Platysma muscle contraction on clenching**

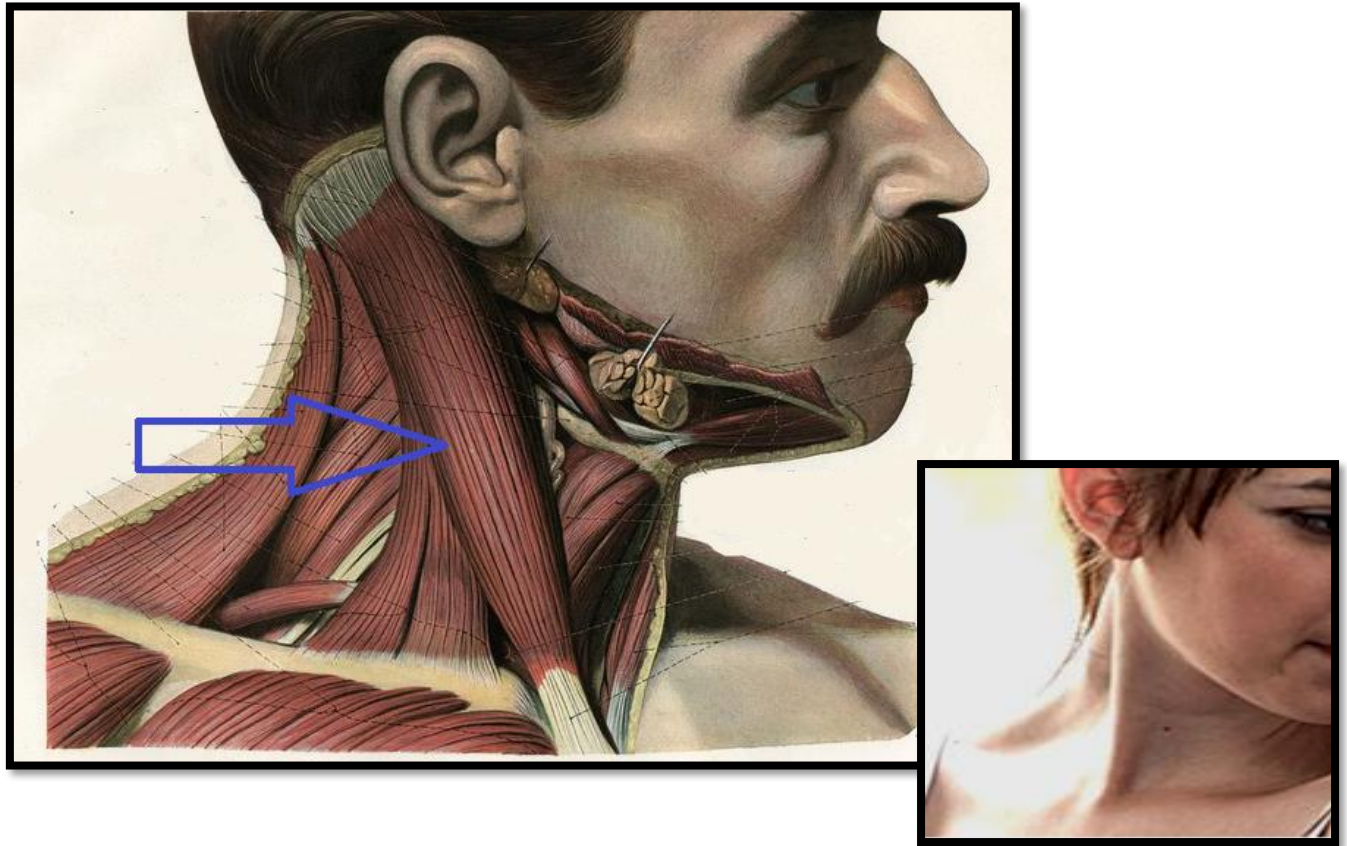
## **Sternocleidomastoid Muscle**

- Origin: two heads; from Manubrium sterni and medial third of the clavicle
- Insertion: mastoid process of the temporal bone
- Innervations: spinal part of the accessory nerve
- Action:
  - extend the neck
  - Flexion
  - rotates the head to the opposite side

On contraction; the muscle appears as an oblique band crossing the side of the neck from the sternum and medial third of the clavicle to the mastoid process of the skull. It divides the neck into anterior and posterior triangles.

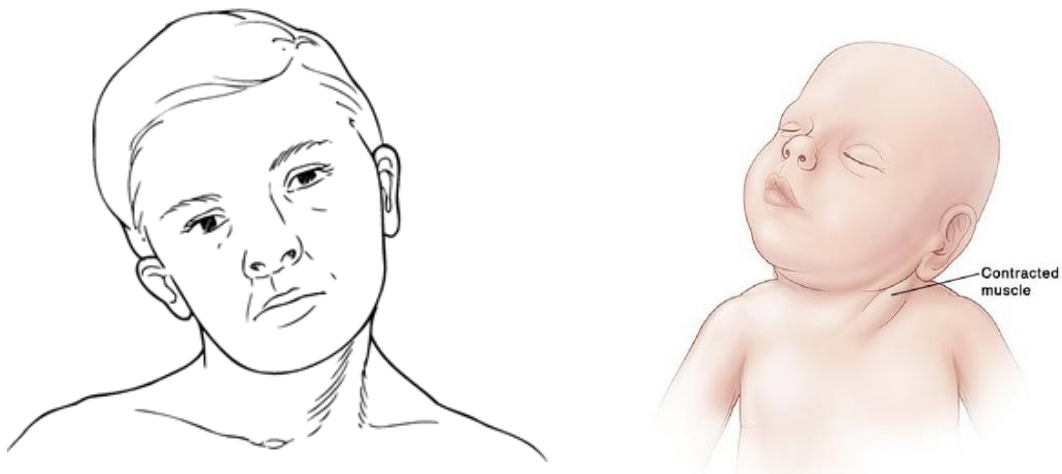
The muscle is covered superficially by skin, superficial fascia, the platysma muscle and investing deep fascia.

Deep to the muscle (covered by the anterior border of the muscle): the carotid arteries, the internal jugular vein, and the deep cervical lymph nodes.



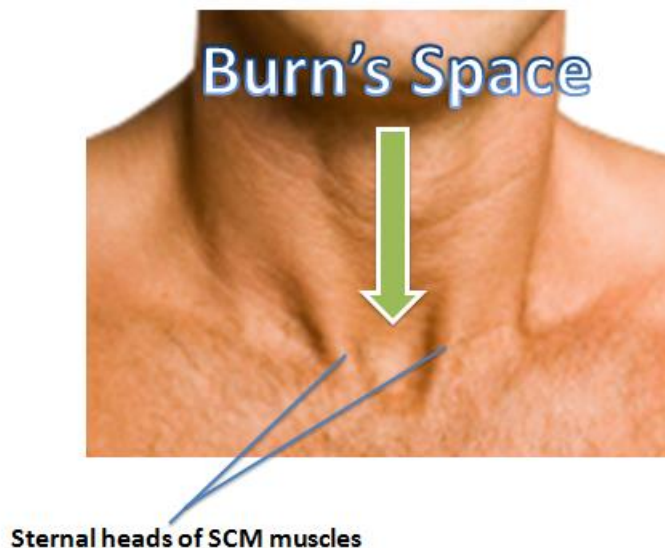
### Clinical Notes

- ❖ Torticollis or cervical dystonia (twisted neck): a condition when the head is held at an angle with the ear down toward the shoulder of one side, due to dysfunction of sternocleidomastoid muscle, it could be spasmodic (painful and associated with infection or abnormal neck movement and posture), or it could be congenital associated with shortening of the muscle itself.





- ❖ Between the two sternal heads of the muscle a triangular space is formed, known as suprasternal space or space of BURN'S.

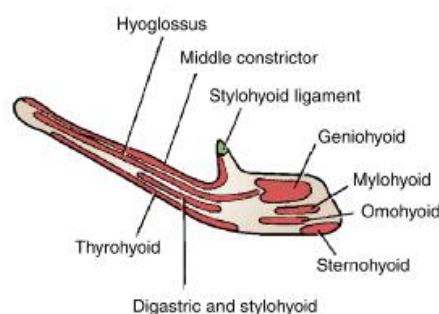
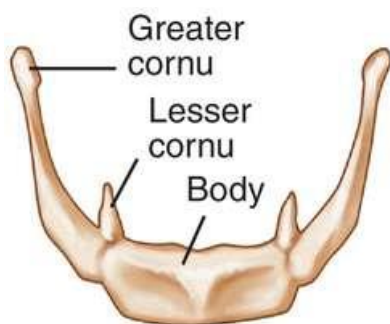


## Hyoid Bone

The hyoid bone is freely mobile single bone found in the midline of the neck below the mandible at the level of C<sub>3</sub>.

The floor of the mouth (Mylohyoid muscle) and tongue are attached to it from above, while the larynx is attached to it from below.

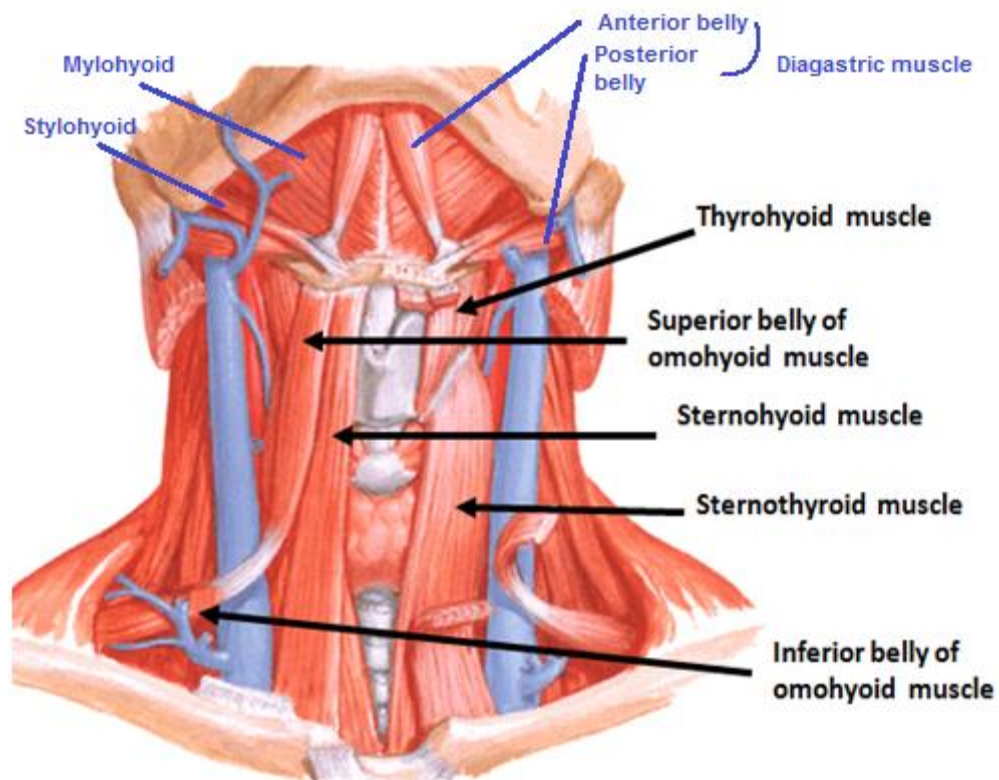
It does not articulate with any other bones. The hyoid bone is U shaped and consists of a body and two greater and two lesser horns (cornu).



## Supra and Infra Hyoid Muscles

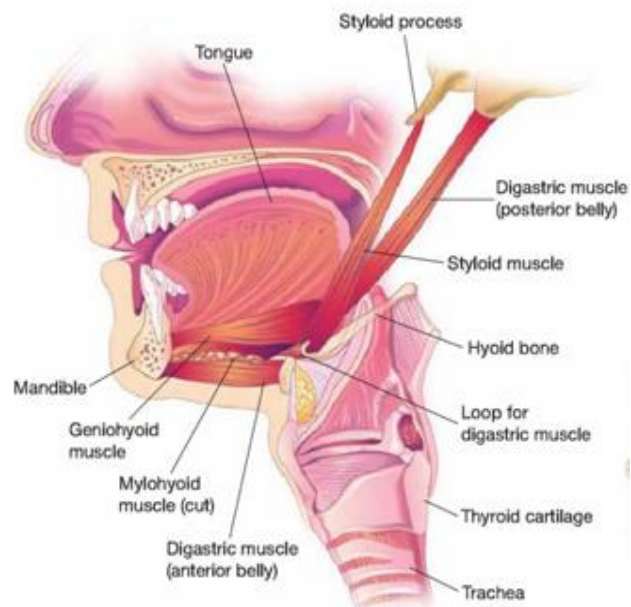
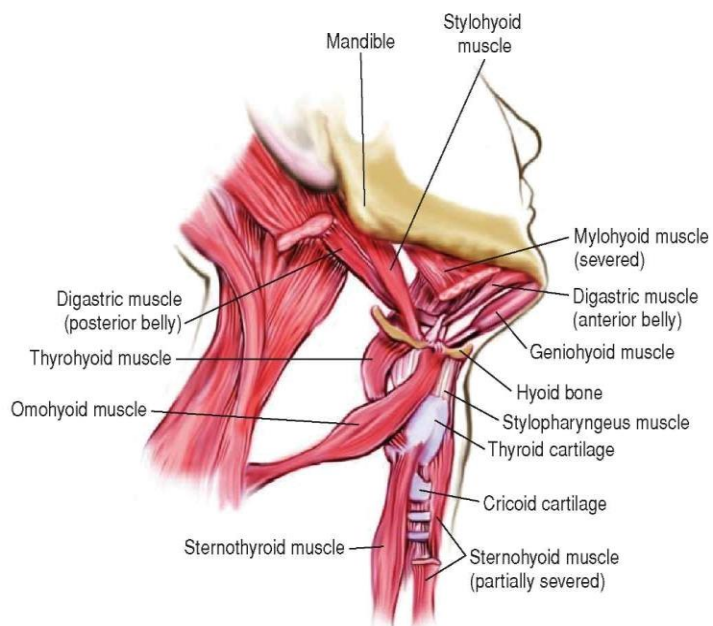
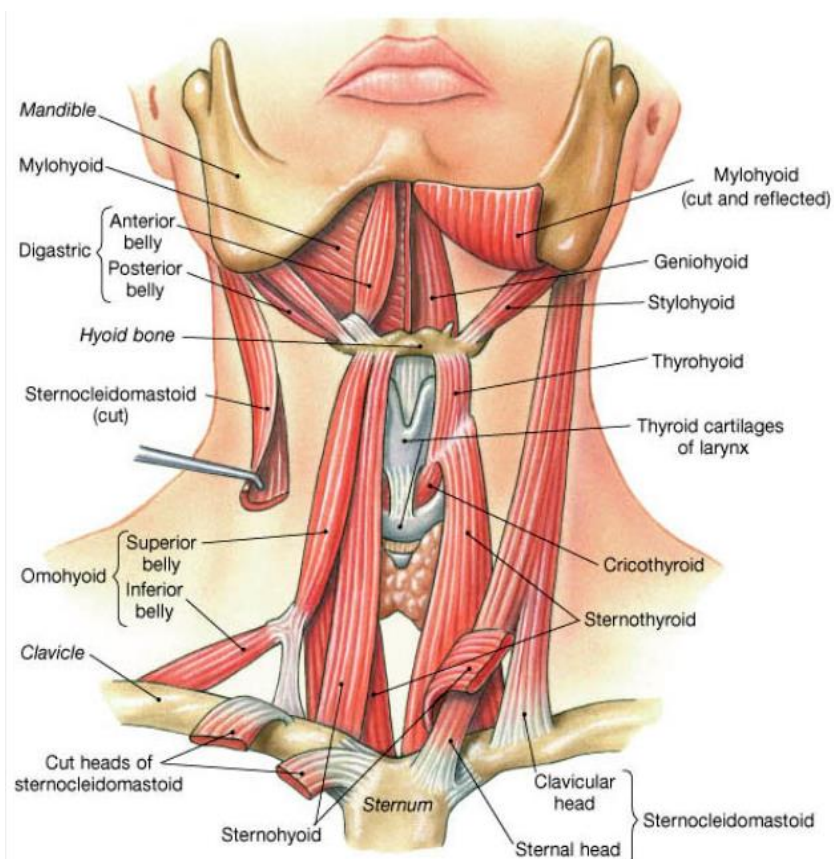
The muscles that attached to Hyoid bone are divided into:

- **Suprahyoid muscles:** connect the hyoid to the mandible and to the styloid process of the temporal bone, include Digastric, Mylohyoid Geniohyoid and Stylohyoid
- **Infrahyoid muscles (Strap muscles):** connect the hyoid to the thyroid cartilage, to the sternum, and to the scapula, include Omohyoid, Sternohyoid, sternothyroid and thyrohyoid



The Hyoid bone with the muscles attached to it

| Muscle  | Origin  | Insertion   | Nerve supply  | Action  |
|---|---|---|---|---|
| <b>Suprahyoid Muscles</b>                               |   |   |   |   |
| <b>Mylohyoid</b><br>(Floor of Mouth)                    | Mylohyoid line of body of mandible                                | Body of hyoid bone<br>And fibrous raphe               | N. to Mylohyoid branch of Mandibular N  | -Elevates the hyoid bone<br>-Depresses the mandible |
| <b>Digastric:</b>                                       |   |   |   |   |
| - <b>Posterior belly</b><br><br>- <b>Anterior belly</b> | Mastoid process of temporal bone<br><br>Body of the mandible      | intermediate tendon held to hyoid by Fascial sling    | N. to Stylohyoid branch of Facial nerve<br><br>N. to Mylohyoid branch of Mandibular N |   |
| <b>Geniohyoid</b>                                       | Mental Spine (Genial Tubercle)                                    | Body of hyoid bone                                    | First cervical Nerve (C1)   |   |
| <b>Stylohyoid</b>                                       | Styloid process   | Body of hyoid bone                                    | N. to Stylohyoid (facial n.)  | Elevates hyoid bone                                 |
| <b>Infrahyoid Muscles</b>                               |   |   |   |   |
| <b>Omohyoid:</b>  |   |   |   |   |
| - <b>Inferior belly</b><br><br>- <b>Superior belly</b>  | Upper margin of Scapula<br><br>Lower border of Body of hyoid bone | intermediate tendon held to clavicle by fascial sling | Ansa Cervicalis (C1, C2 and C3)   | Depresses hyoid bone                                |
| <b>Sternohyoid</b>                                      | Manubrium sterni and clavicle                                     | Body of hyoid bone                                    |   |   |
| <b>Sternothyroid</b>                                    | Manubrium sterni  | Oblique line of thyroid cartilage                     |   | Depresses The larynx                                |
| <b>Thyrohyoid</b>                                       | Oblique line of thyroid cartilage                                 | Body of hyoid bone                                    | First cervical nerve  | depresses hyoid Bone or elevates the larynx         |



## Suprahyoid and Infrahyoid Muscles

**This is the End of the Lecture – Good Luck**