ANATOMY

ANATOMY

NECK

AREAS	BONES	ORGANS	MUSCLES	NERVES	VESSELS	OTHER
• Anterior Triangle • Posterior Triangle	• Cervical Spine • Hyoid Bone	• Pharynx • Larynx • Oesophagus • Thyroid Gland • Parathyroid Glands	• Suboccipital • Suprahyoids • Infrahyoids • Scalenes	• Phrenic Nerve • Cervical Plexus	• Arterial Supply • Venous Drainage • Lymphatics	• Fascial Layers

Neck

NECK

MUSCLES

- **SUBOCCIPITAL**
- **SUPRAHYOIDS**
- **INFRAHYOIDS**
- **SCALENES**

MUSCLES OF THE NECK

SUBOCCIPITAL GROUP

Contents

1 Rectus Capitis Posterior Major

2 Rectus Capitis Posterior Minor

3 Obliquus Capitis Inferior

4 Obliquus Capitis Superior

5 Suboccipital Triangle

Suboccipital Group of Muscle

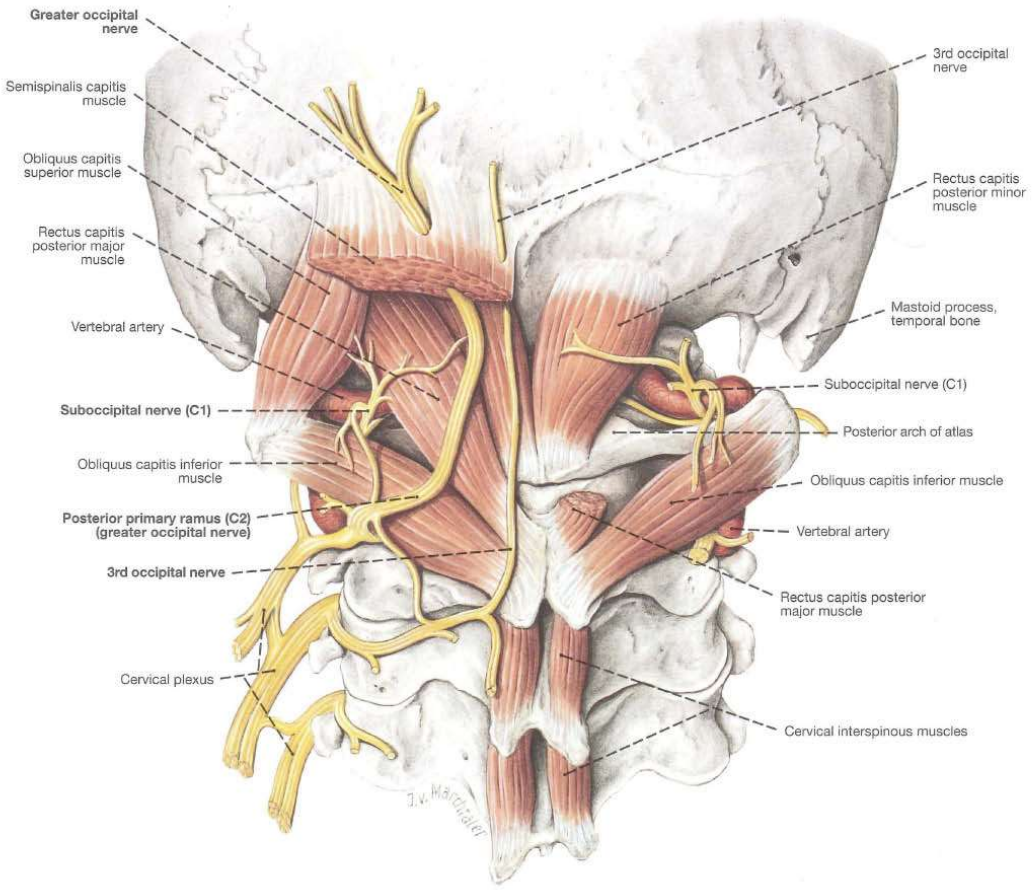
- The **suboccipital muscles** are a group of four muscles situated underneath the occipital bone. All the muscles in this group are innervated by the suboccipital nerve.
- They are located within the **suboccipital compartment** of the neck; deep to the sternocleidomastoid, trapezius, splenius and semispinalis muscles. They collectively act to extend and rotate the head.
- In this article, we shall look at the anatomy of the suboccipital muscles – their attachments, actions and innervation.

Suboccipital Group of Muscle

Rectus Capitis Posterior Major

- The rectus capitis posterior major is the larger of the rectus capitis muscles. It is located laterally to the rectus capitis posterior minor.
- **Attachments:** Originates from the spinous process of the C2 vertebrae (axis), and inserts into the lateral part of the inferior nuchal line of the occipital bone.
- **Actions**: Extension and rotation of the head.
- **Innervation**: Suboccipital nerve (posterior ramus of C1).

Rectus Capitis Posterior Major

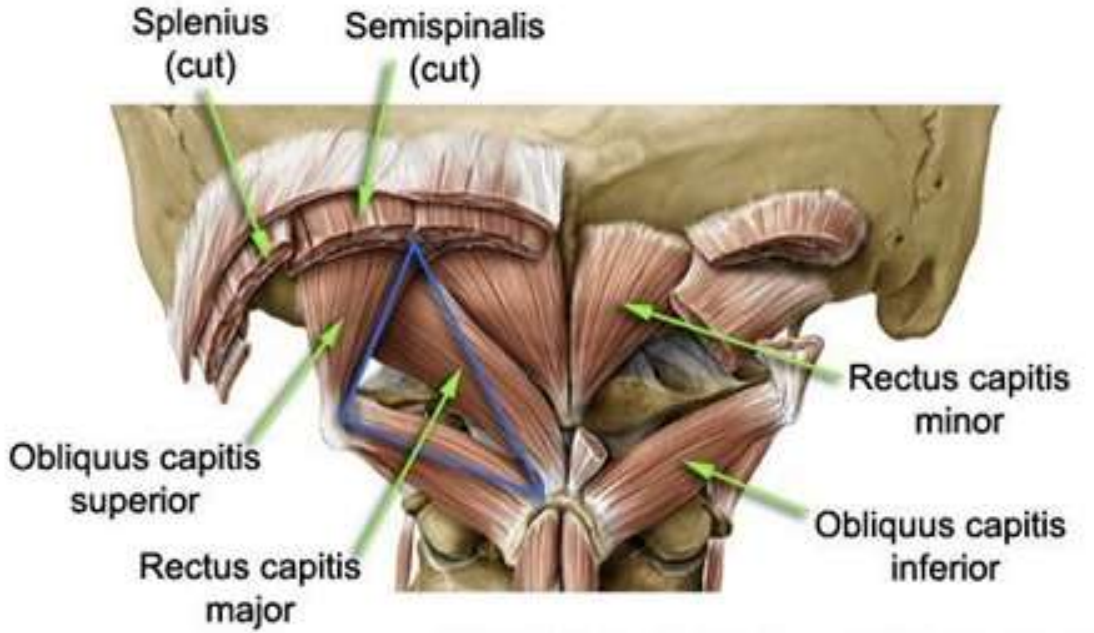


Suboccipital Group of Muscle

Rectus Capitis Posterior Minor

- The rectus capitis posterior minor is the most medial of the suboccipital muscles. There is a connective tissue bridge between this muscle and the dura mater (outer membrane of the meninges) – which may play a role in cervicogenic headaches.
- **Attachments:** Runs from the posterior tubercle (a rudimentary spinous process) of the C1 vertebra to the medial part of the inferior nuchal line of the occipital bone.
- **Actions**: Extension of the head.
- **Innervation**: Suboccipital nerve (posterior ramus of C1).

RECTUS CAPITIS MINOR

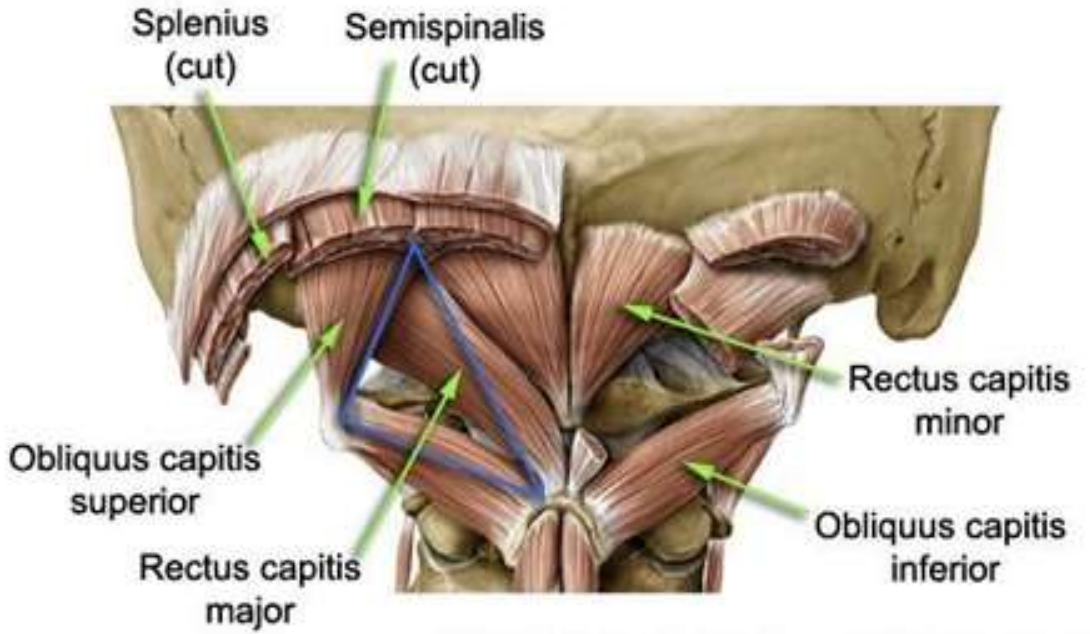


Suboccipital Group of Muscle

Obliquus Capitis Inferior

- As its name suggests, the obliquus capitis inferior is the most inferiorly positioned of the suboccipital muscles. Additionally, it is the only capitis muscle that has no attachment to the cranium.
- **Attachments:** Originates from the spinous process of the C2 vertebra, and attaches into the transverse process of C1.
- **Actions**: Extension and rotation of the head.
- **Innervation**: Suboccipital nerve (posterior ramus of C1)

Obliquus Capitis Inferior

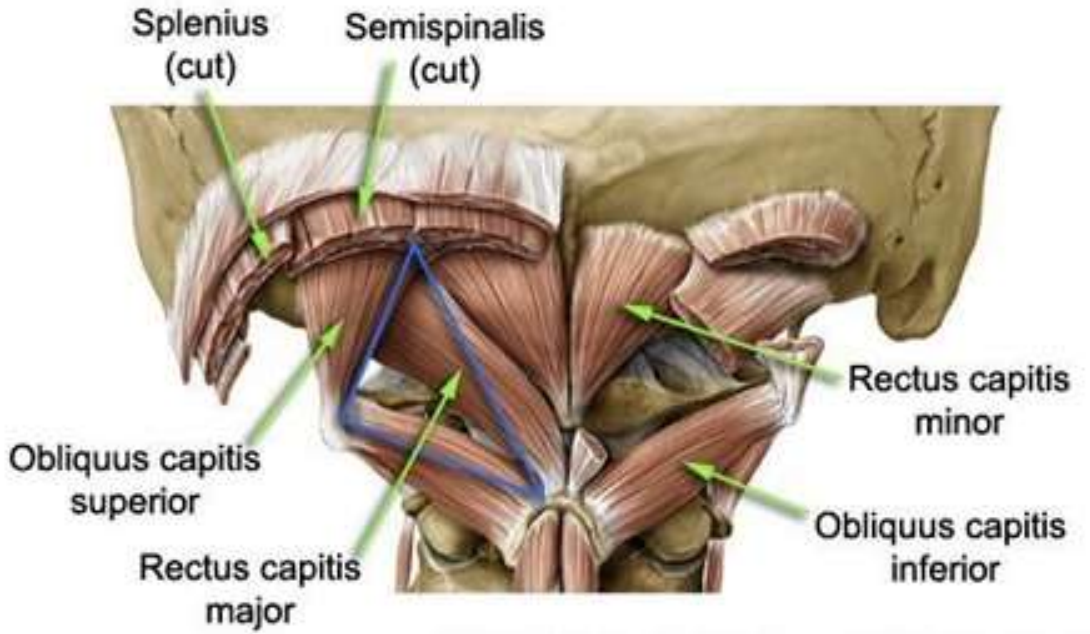


Suboccipital Group of Muscle

Obliquus Capitis Superior

- The obliquus capitis superior is located laterally in the suboccipital compartment.
- **Attachments:** Originates from the transverse process of C1 and attaches into the occipital bone (between the superior and inferior nuchal lines).
- **Actions**: Extension of the head.
- **Innervation**: Suboccipital nerve (posterior ramus of C1)

Obliquus Capitis Inferior



Suboccipital Group of Muscle

Suboccipital Triangle

- The **suboccipital triangle** is an area bordered by three of the suboccipital muscles. It contains the vertebral artery (can be identified during surgery), suboccipital venous plexus and suboccipital nerve. Its borders are as follows:
- **Superomedial**: Rectus capitus posterior major
- **Superolateral**: Obliquus capitus superior
- **Inferior**: Obliquus capitus inferior
- **Floor**: Posterior atlanto-occiptal membrane and posterior arch of the C1 vertebrae (atlas)
- **Roof**: Semispinalis capitus

Suboccipital Traingle

SUBOCCIPITAL TRIANGLE:

These are a pair of muscular triangles situated on each side of the midline in the suboccipital region.

BOUNDARIES:

Supero-medially :

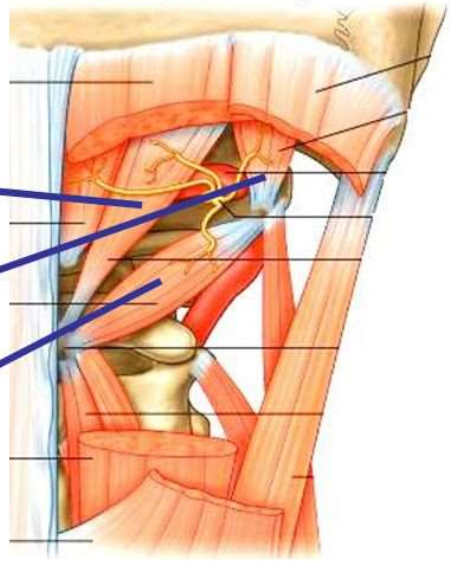
Rectus capitis posterior major

Supero-laterally :

Obliquus capitis superior

Inferiorly :

Obliquus capitis inferior



NECK

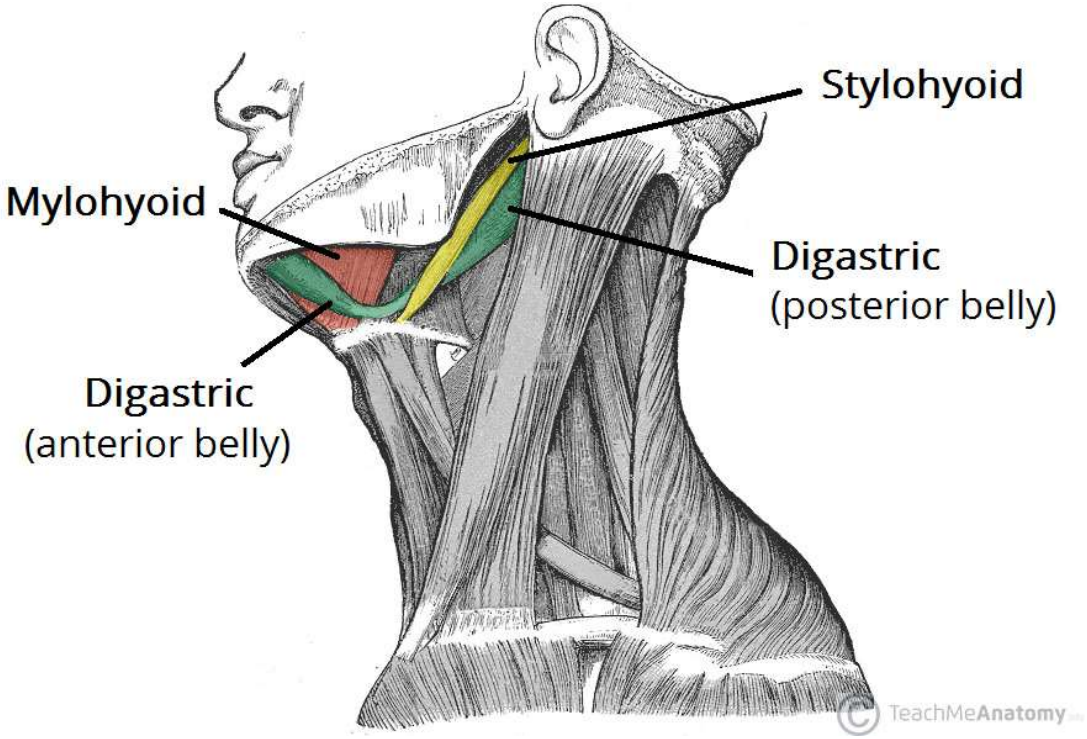
MUSCLES

- **SUBOCCIPITALS**
- **SUPRAHYOIDS**
- **INFRAHYOIDS**
- **SCALENES**

SUPRAHYOID MUSCLES

Contents

SUPRAHYOID MUSCLES



SUPRAHYOID MUSCLES

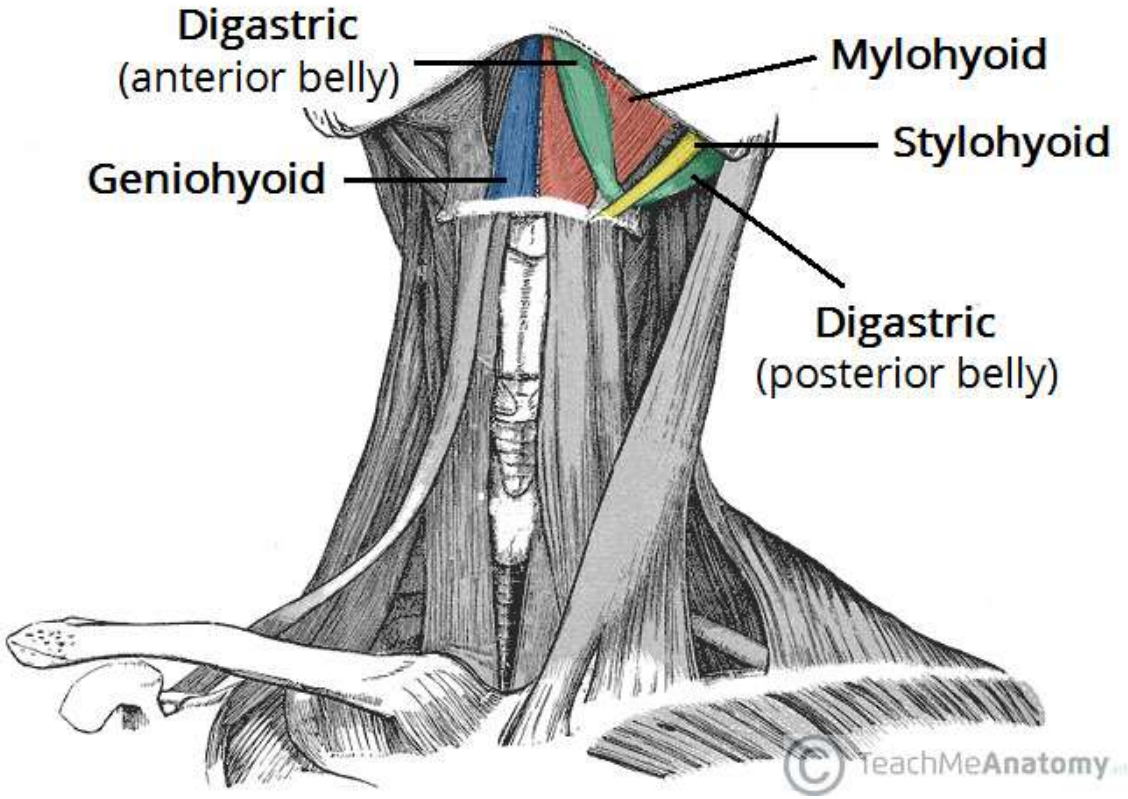
- The **suprahyoid muscles** are a group of four muscles, located superiorly to the hyoid bone of the neck. They all act to elevate the hyoid bone – an action involved in swallowing.
- The arterial supply to these muscles is via branches of the **facial artery**, occipital artery and lingual artery.
- In this article, we shall look at the anatomy of the **suprahyoid muscles** – their attachments, actions and innervation.

SUPROHYOID MUSCLES

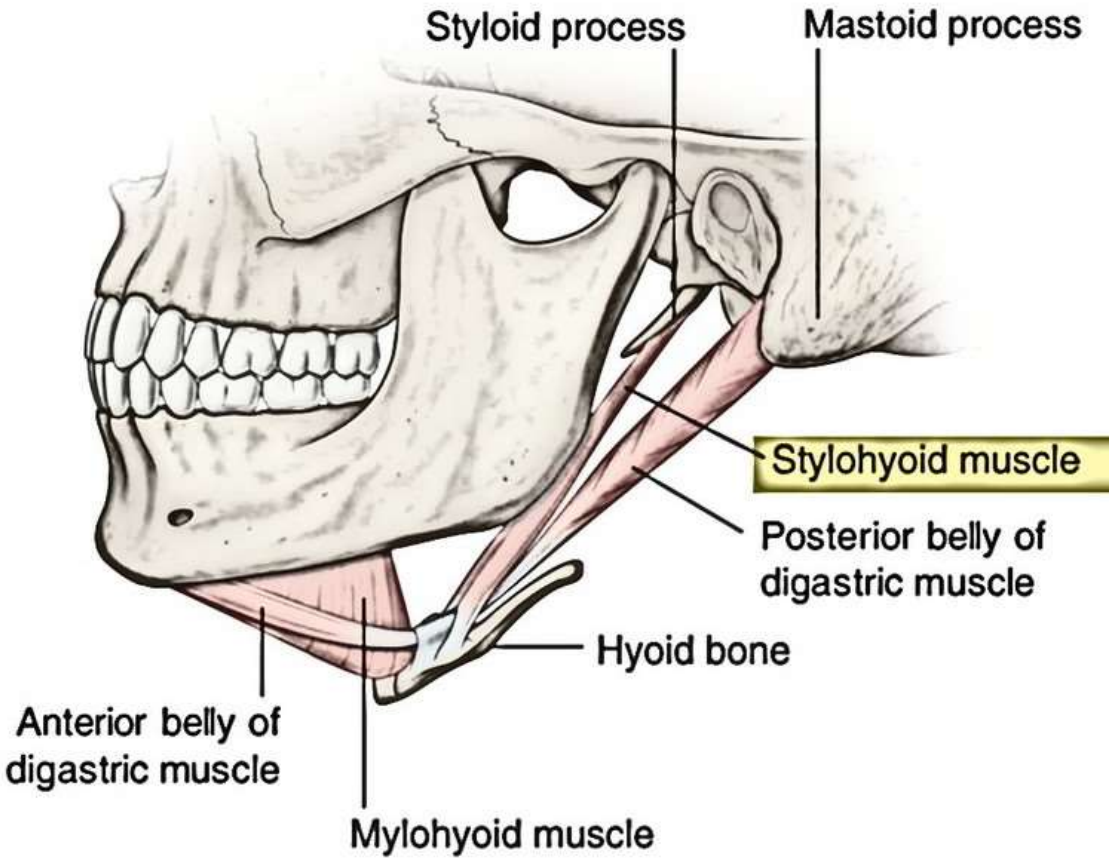
Stylohyoid

- The stylohyoid muscle is a thin muscular strip, which is located **superiorly** to the posterior belly of the digastric muscle.
- **Attachments:** Arises from the styloid process of the temporal bone and attaches to the lateral aspect of the hyoid bone.
- **Actions**: Initiates a swallowing action by pulling the hyoid bone in a posterior and superior direction.
- **Innervation**: Stylohyoid branch of the facial nerve (CN VII). This arises proximally to the parotid gland.

STYLOHYOID


Digastric
(anterior belly)
Mylohyoid
Stylohyoid
Geniohyoid
Digastric
(posterior belly)
TeachMeAnatomy

STYLOHYOID

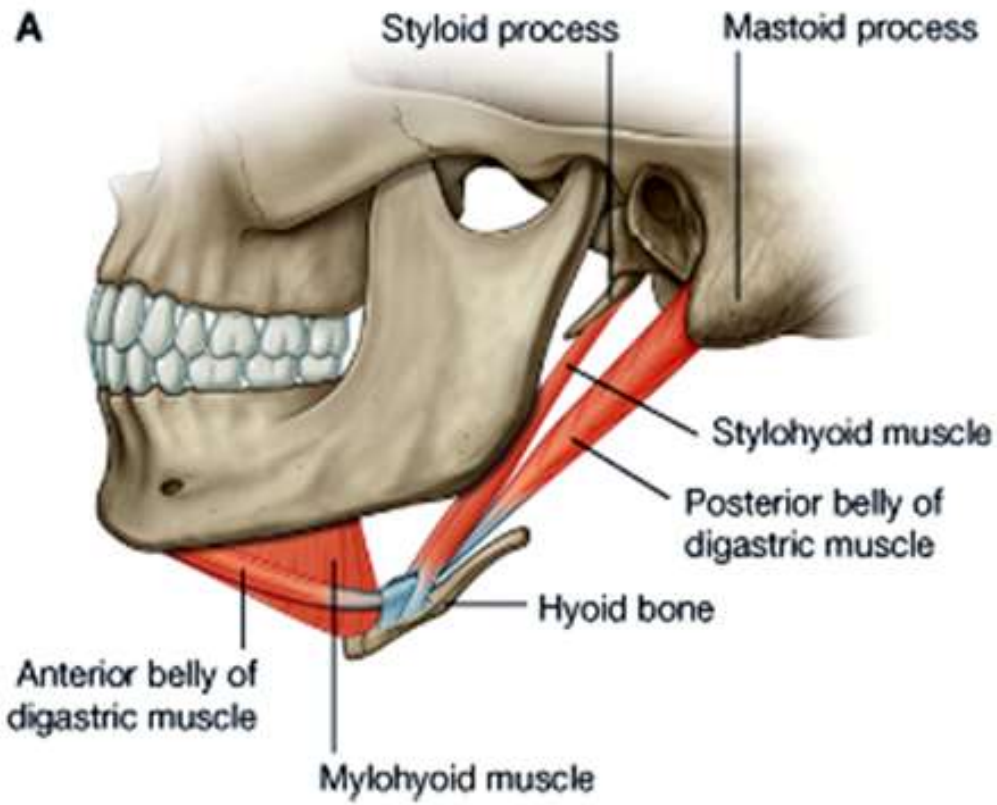

Styloid process
Mastoid process
Stylohyoid muscle
Posterior belly of digastric muscle
Hyoid bone
Anterior belly of digastric muscle
Mylohyoid muscle

SUPROHYOID MUSCLES

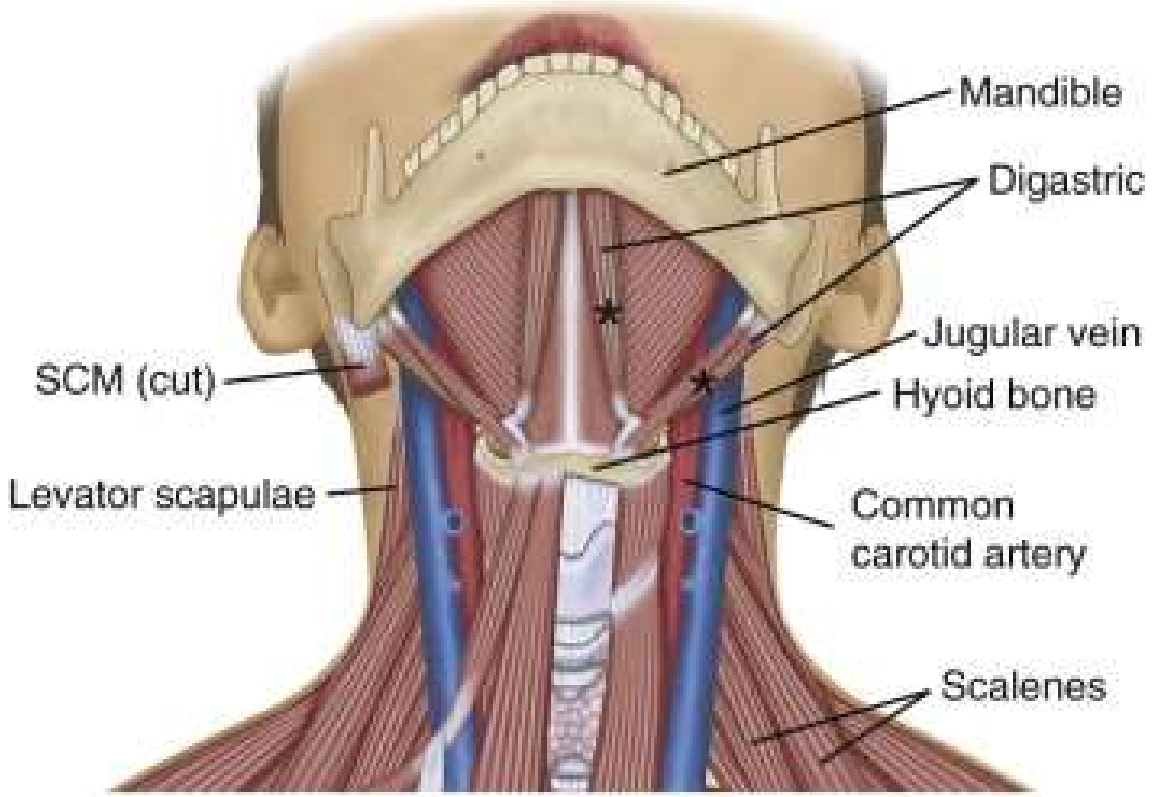
Digastric

- The digastric is comprised of two muscular bellies, which are connected by a tendon. In some cadaveric specimens, this tendon can be seen to pierce the stylohyoid muscle.
- **Attachments:**
  - The anterior belly arises from the digastric fossa of the mandible.
  - The posterior belly arises from the mastoid process of the temporal bone.
  - The two bellies are connected by an intermediate tendon, which is attached to the hyoid bone via a fibrous sling.
- **Actions**: Depresses the mandible and elevates the hyoid bone.
- **Innervation**:
  - The anterior belly is innervated by the inferior alveolar nerve, a branch of the mandibular nerve (which is derived from the trigeminal nerve, CN V).
  - The posterior belly is innervated by the digastric branch of the facial nerve.

DIGASTRIC MUSCLE



DIAGASTRIC MUSCLE

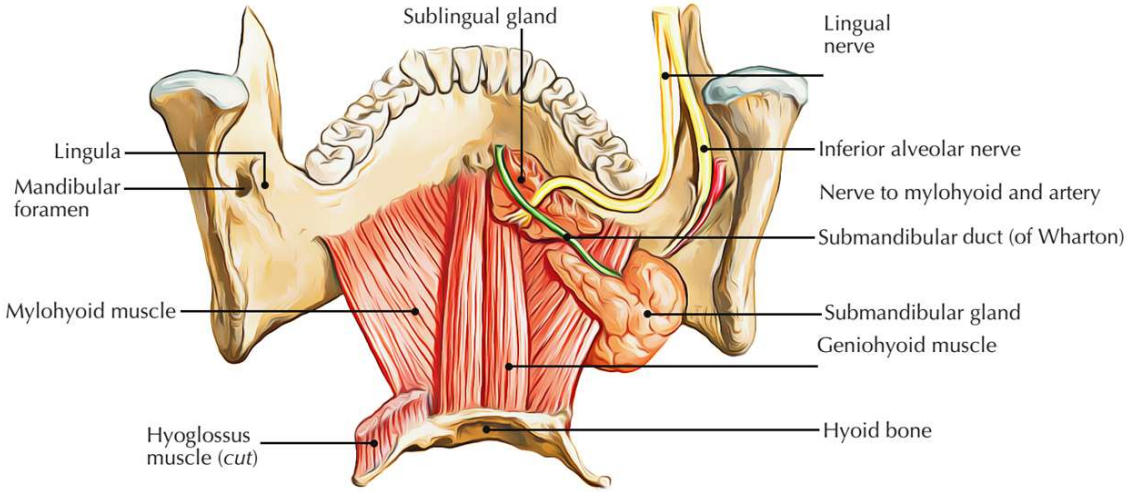


SUPROHYOID MUSCLES

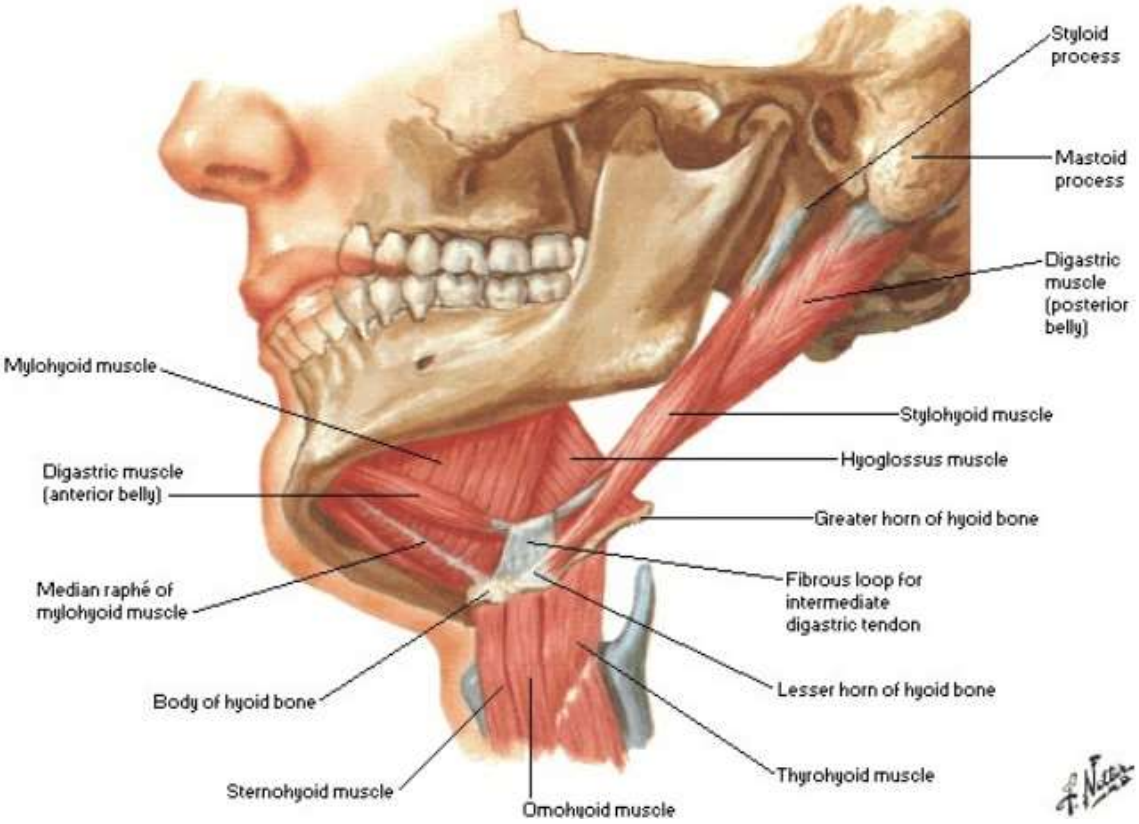
Mylohyoid

- The mylohyoid is a broad, triangular shaped muscle. It forms the floor of the oral cavity and supports the floor of the mouth.
- **Attachments**: Originates from the mylohyoid line of the mandible, and attaches onto the hyoid bone.
- **Actions**: Elevates the hyoid bone and the floor of the mouth.
- **Innervation**: Inferior alveolar nerve, a branch of the mandibular nerve (which is derived from the trigeminal nerve).

MYLOHYOID


Sublingual gland
Lingual nerve
Lingula
Mandibular foramen
Inferior alveolar nerve
Nerve to mylohyoid and artery
Submandibular duct (of Wharton)
Mylohyoid muscle
Submandibular gland
Geniohyoid muscle
Hyoglossus muscle (*cut*)
Hyoid bone

MYLOHYOID

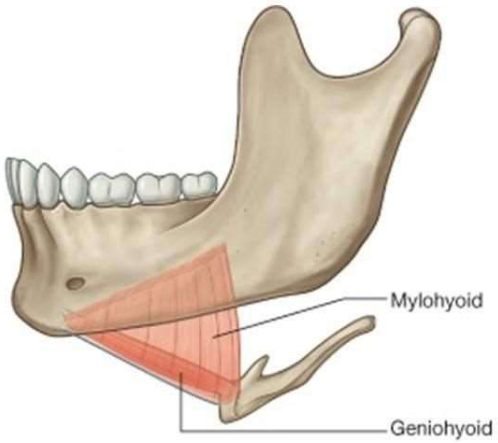

Styloid process
Mastoid process
Digastric muscle (posterior belly)
Mylohyoid muscle
Stylohyoid muscle
Hyoglossus muscle
Digastric muscle (anterior belly)
Greater horn of hyoid bone
Median raphé of mylohyoid muscle
Fibrous loop for intermediate digastric tendon
Lesser horn of hyoid bone
Body of hyoid bone
Thyrohyoid muscle
Sternohyoid muscle
Omohyoid muscle

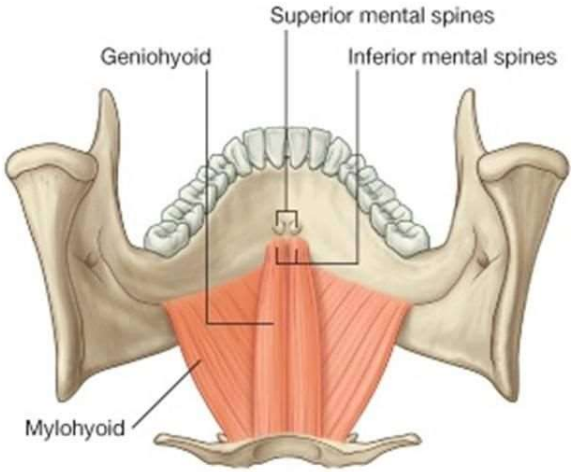
SUPROHYOID MUSCLES

Geniohyoid

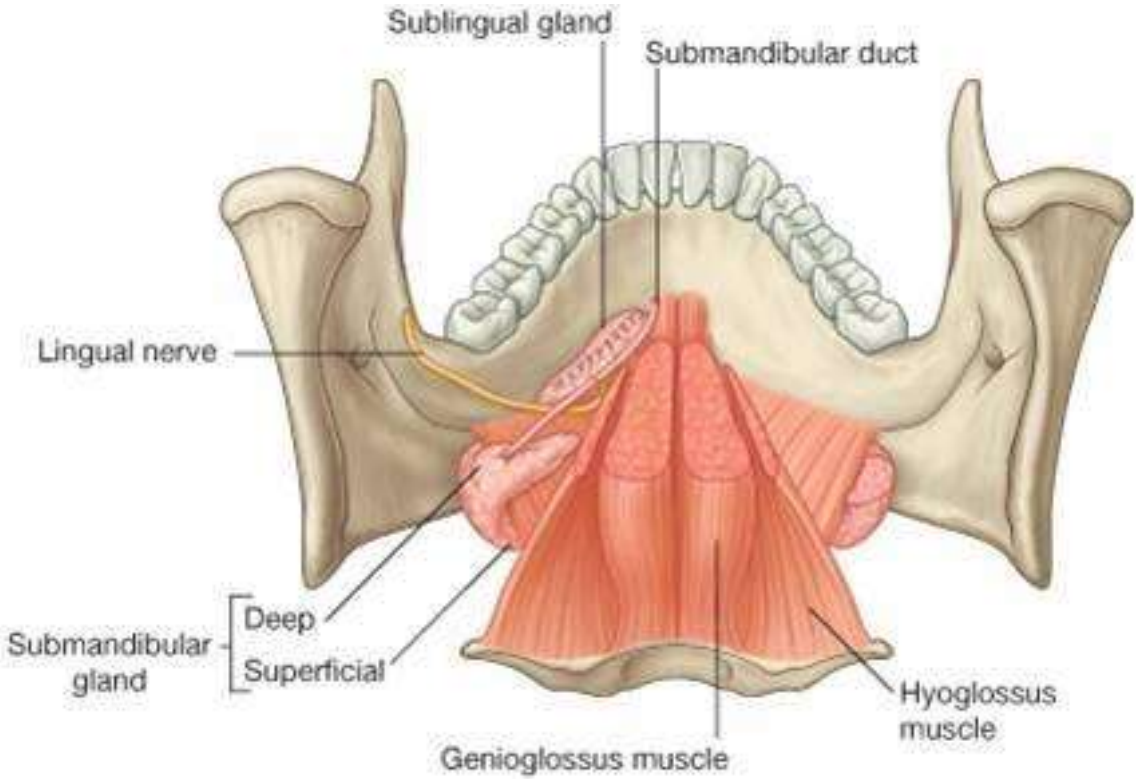
- The geniohyoid is located close to the midline of the neck, deep to the mylohyoid muscle.
- **Attachments**: Arises from the inferior mental spine of the mandible. It then travels inferiorly and posteriorly to attach to the hyoid bone.
- **Actions**: Depresses the mandible and elevates the hyoid bone.
- **Innervation**: C1 nerve roots that run within the hypoglossal nerve.

GENIOHYOID


Mylohyoid
Geniohyoid


Superior mental spines
Geniohyoid
Inferior mental spines
Mylohyoid

GENIOHYOID


Sublingual gland
Submandibular duct
Lingual nerve
Submandibular gland
Deep
Superficial
Hyoglossus muscle
Genioglossus muscle

NECK

MUSCLES

- **SUBOCCIPITALS**
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- **SCALENES**

MUSCLES OF THE NECK

INFRAHYOIDS

INFRAHYOIDS

Contents

INFRAHYOID MUSCLES

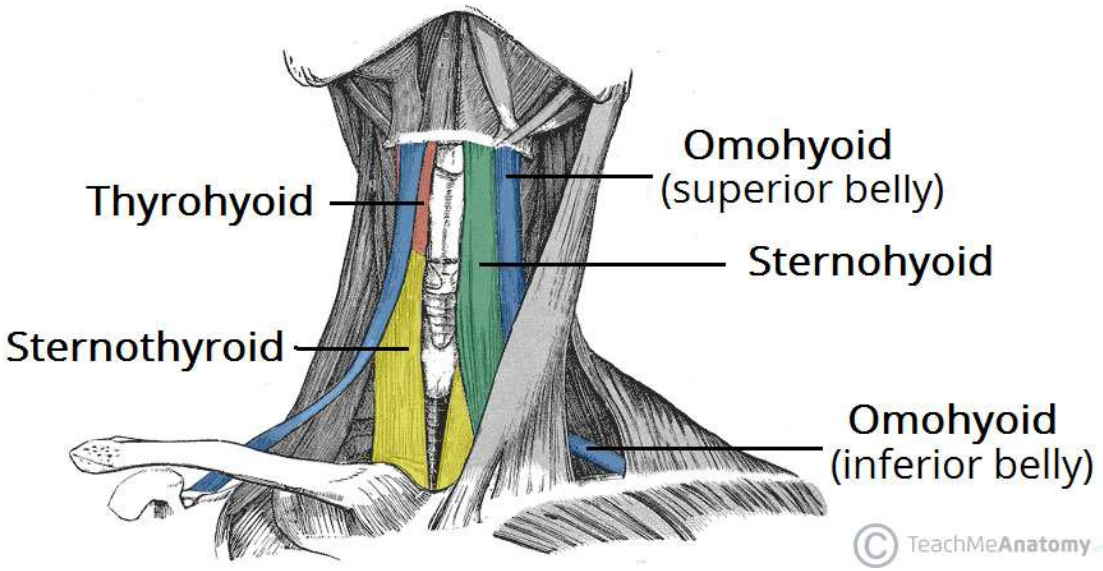
- The infrahyoid muscles are a group of four muscles that are located inferiorly to the hyoid bone in the neck. They can be divided into two groups:
- **Superficial plane** – omohyoid and sternohyoid muscles.
- **Deep plane** – sternothyroid and thyrohyoid muscles.
- The arterial supply to the infrahyoid muscles is via the superior and inferior **thyroid arteries**, with venous drainage via the corresponding veins.
- In this article, we shall look at the anatomy of the **infrahyoid muscles** – their attachments, actions and innervations.

INFRAHYOID MUSCLES

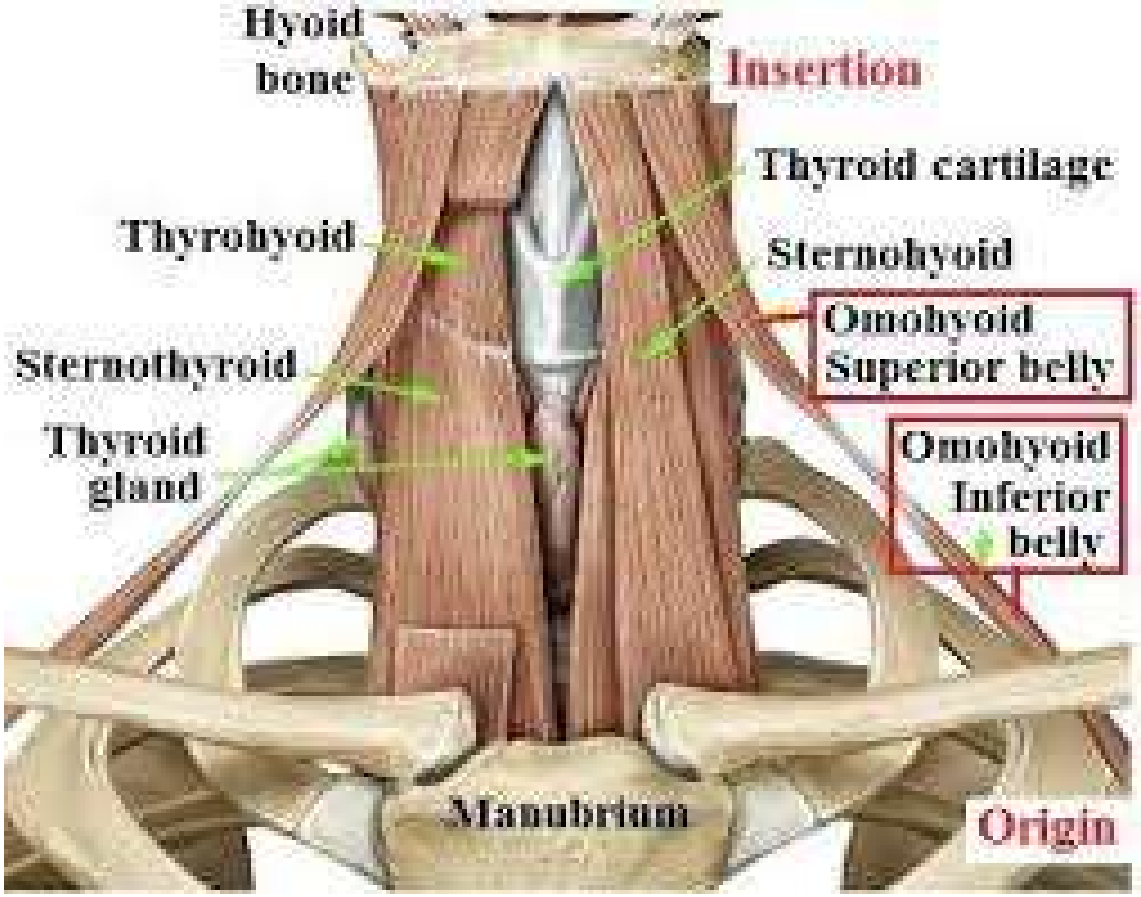
Omohyoid

- The omohyoid is comprised of two muscle bellies, which are connected by a muscular tendon.
- **Attachments**:
  - The inferior belly of the omohyoid arises from the scapula. It runs superomedially underneath the sternocleidomastoid muscle.
  - It is attached to the superior belly by an intermediate tendon, which is anchored to the clavicle by the deep cervical fascia.
  - From here, the superior belly ascends to attach to the hyoid bone.
- **Actions**: Depresses the hyoid bone.
- **Innervation**: Anterior rami of C1-C3, carried by a branch of the ansa cervicalis.

Omohyoid Muscle



Omohyoid

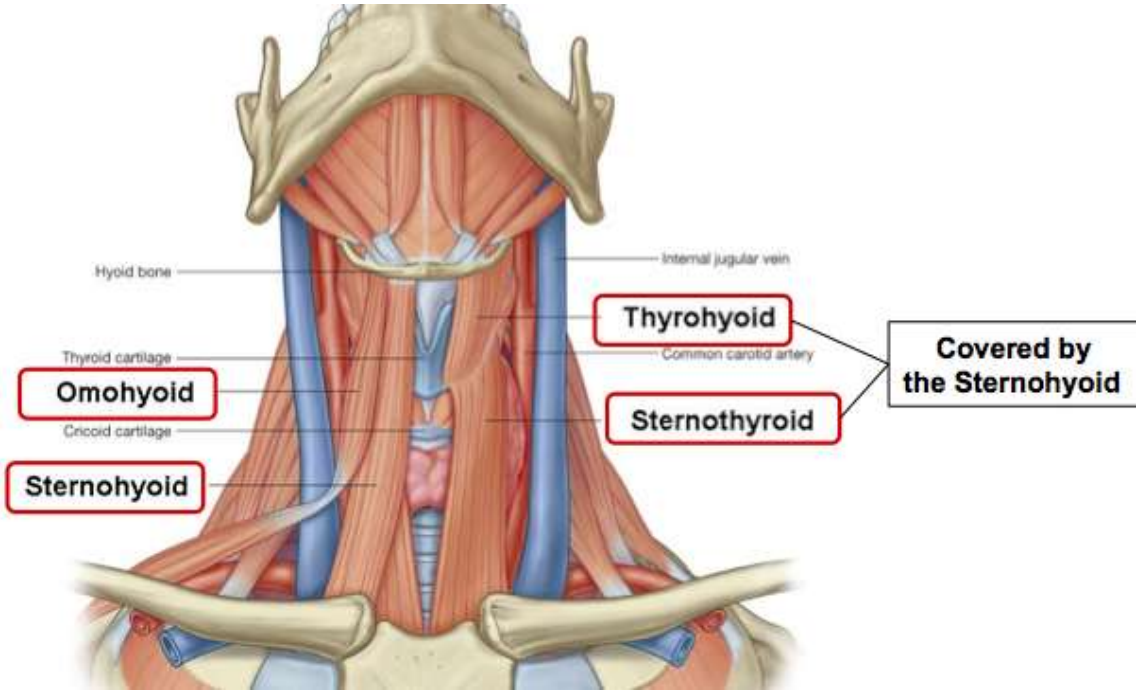

Hyoid bone
Insertion
Thyroid cartilage
Thyrohyoid
Sternohyoid
Omohyoid Superior belly
Sternothyroid
Thyroid gland
Omohyoid Inferior belly
Manubrium
Origin

INFRAHYOID MUSCLES

Sternohyoid

- The sternohyoid muscle is located within the superficial plane.
- **Attachments**: Originates from the sternum and sternoclavicular joint. It ascends to insert onto the hyoid bone.
- **Actions**: Depresses the hyoid bone.
- **Innervation**: Anterior rami of C1-C3, carried by a branch of the ansa cervicalis.

Sternohyoid

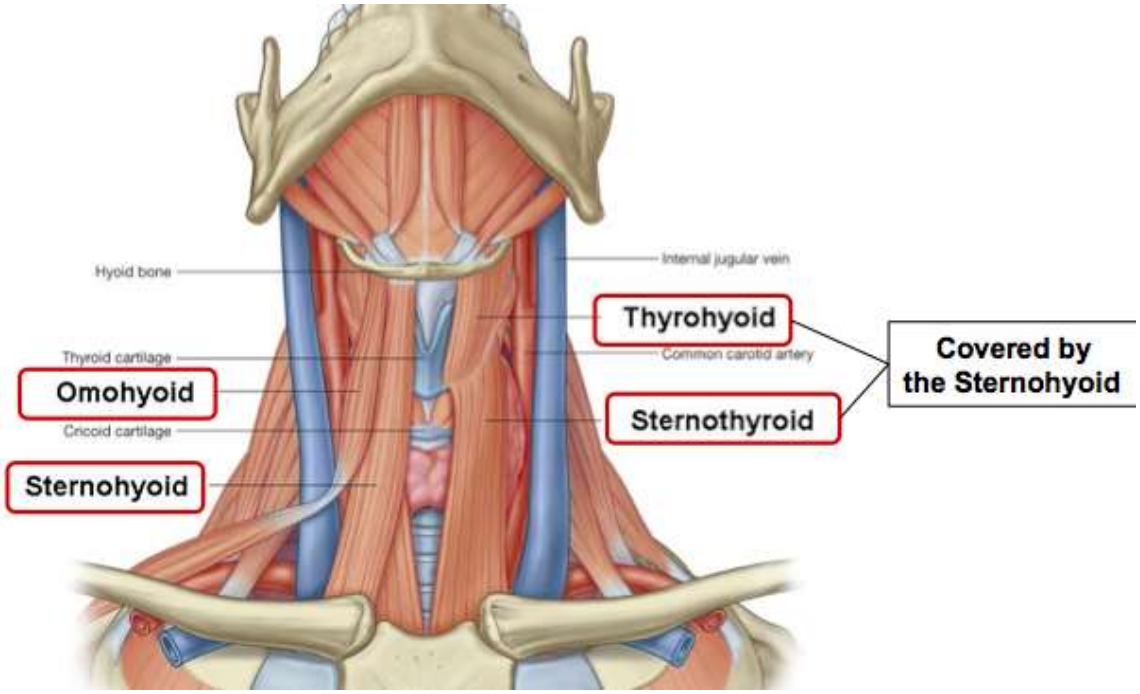


INFRAHYOID MUSCLES

Sternothyroid

- The sternothyroid muscle is wider and deeper than the sternohyoid. It is located within the deep plane.
- **Attachments:** Arises from the manubrium of the sternum, and attaches to the thyroid cartilage.
- **Actions**: Depresses the thyroid cartilage.
- **Innervation**: Anterior rami of C1-C3, carried by a branch of the ansa cervicalis

STERNOTHYROID

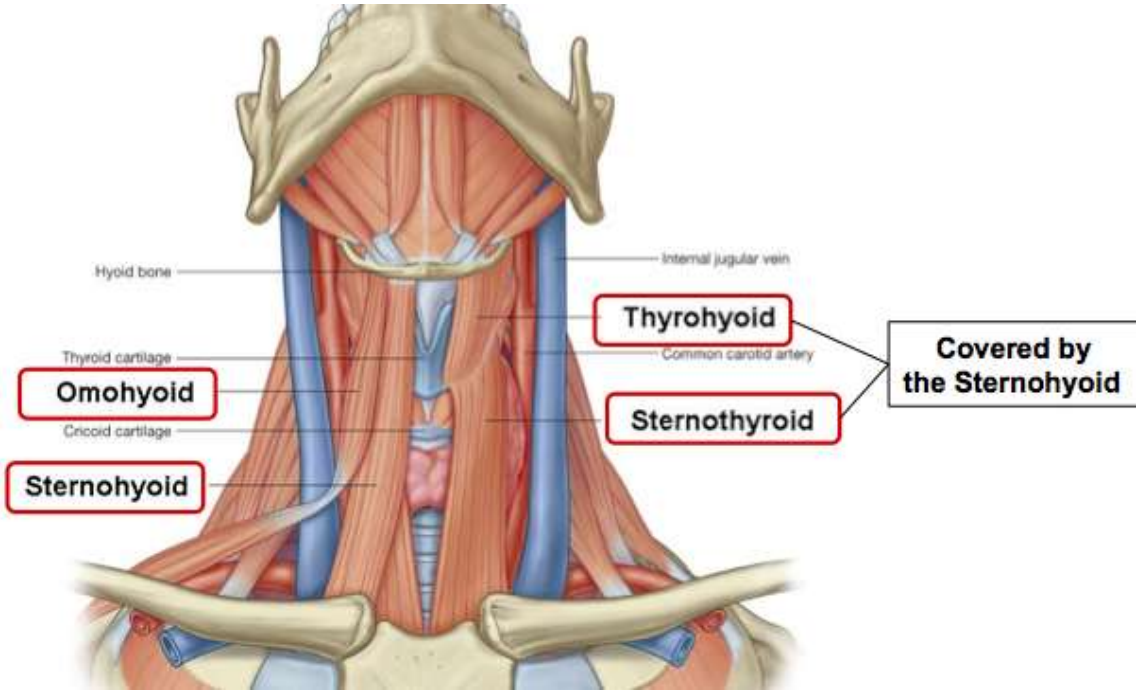


INFRAHYOID MUSCLES

Thyrohyoid

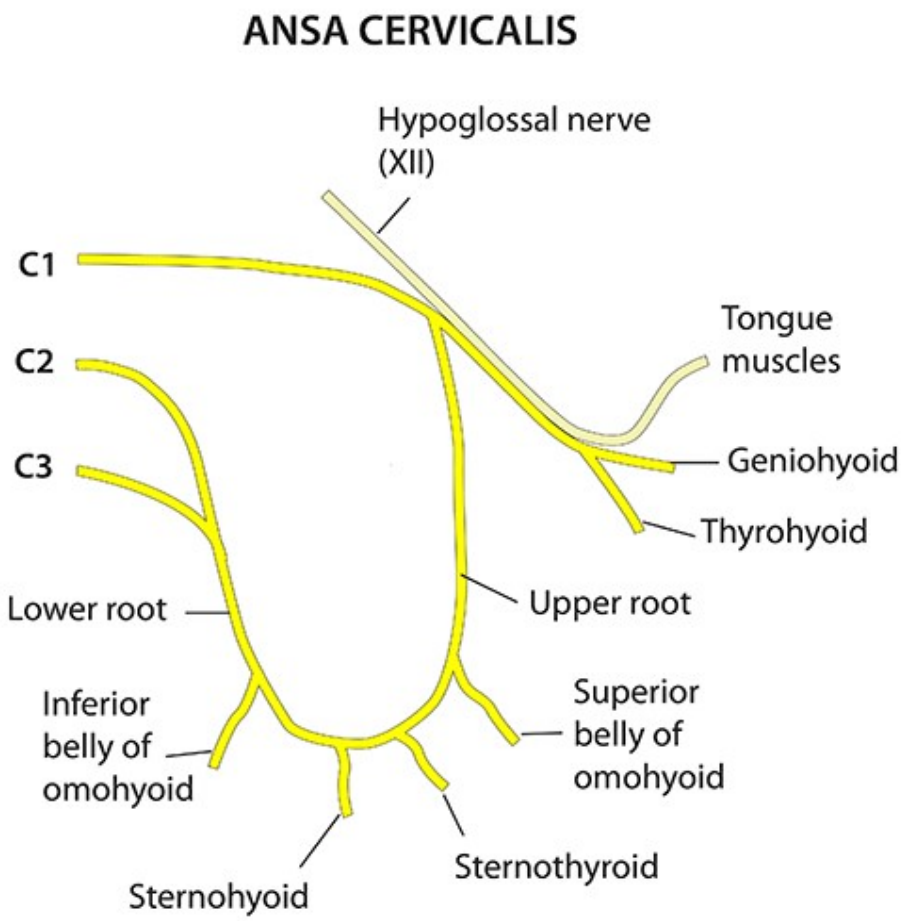
- The thyrohyoid is a short band of muscle, thought to be a continuation of the sternothyroid muscle.
- **Attachments**: Arises from the thyroid cartilage of the larynx, and ascends to attach to the hyoid bone.
- **Actions**: Depresses the hyoid. If the hyoid bone is fixed, it can elevate the larynx.
- **Innervation**: Anterior ramus of C1, carried within the hypoglossal nerve.

THYROHYOID


Hyoid bone
Thyroid cartilage
Omohyoid
Cricoid cartilage
Sternohyoid
Internal jugular vein
Thyrohyoid
Common carotid artery
Sternothyroid
Covered by the Sternohyoid

INFRAHYOID MUSCLE

ANSA CERVICALIS



NECK

MUSCLES

- **SUBOCCIPITALS**
- **SUPRAHYOIDS**
- **INFRAHYOIDS**
- **SCALENES**

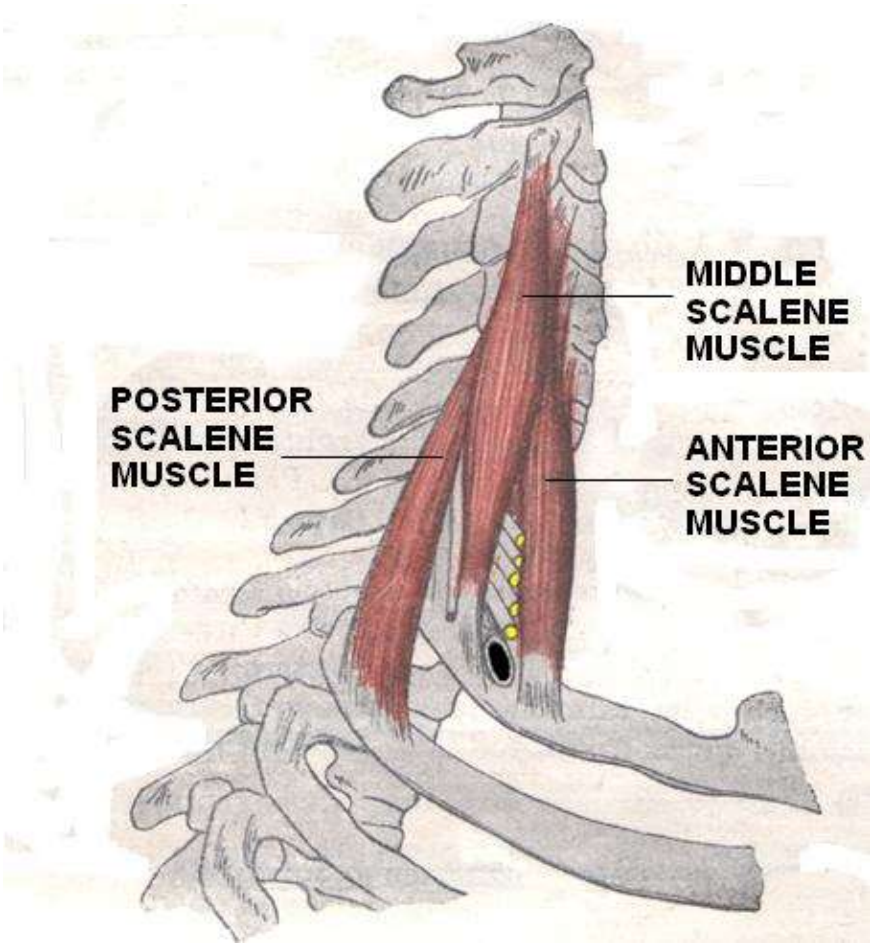
MUSCLES OF THE NECK

SCALENE MUSCLE

Contents

Muscles of Neck

Scalene Muscles



SCALENE MUSCLE

- The **scalene muscles** are three paired muscles (anterior, middle and posterior), located in the lateral aspect of the neck. Collectively, they form part of the floor of the posterior triangle of the neck.
- The scalenes act as **accessory muscles of respiration**, and perform flexion at the neck.
- In this article, we shall look at the anatomy of the scalene muscles – their attachments, function, innervation and clinical importance.

SCALENE MUSCLE

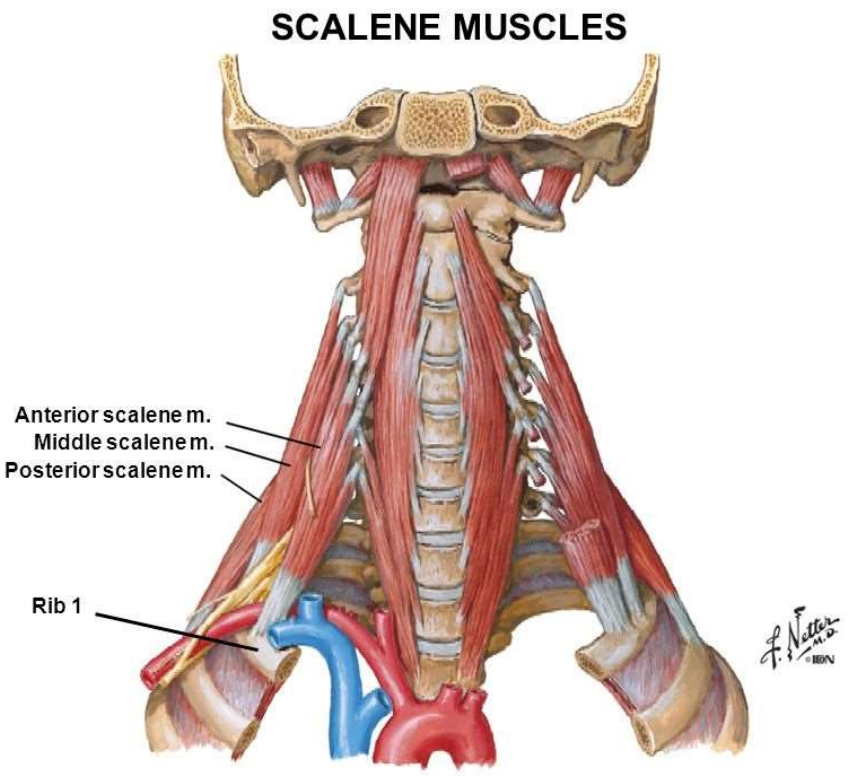
Scalene Muscles

Anterior Scalene

- The anterior scalene muscle lies on the lateral aspect of the neck, deep to the prominent sternocleidomastoid muscle.
- **Attachments**: Originates from the anterior tubercles of the transverse processes of C3-C6, and attaches onto the scalene tubercle, on the inner border of the first rib.
- **Function**: Elevation of the first rib. Ipsilateral contraction causes ipsilateral lateral flexion of the neck, and bilateral contraction causes anterior flexion of the neck.
- **Innervation**: Anterior rami of C5-C6.

Scalene Muscles

Anterior Scalene



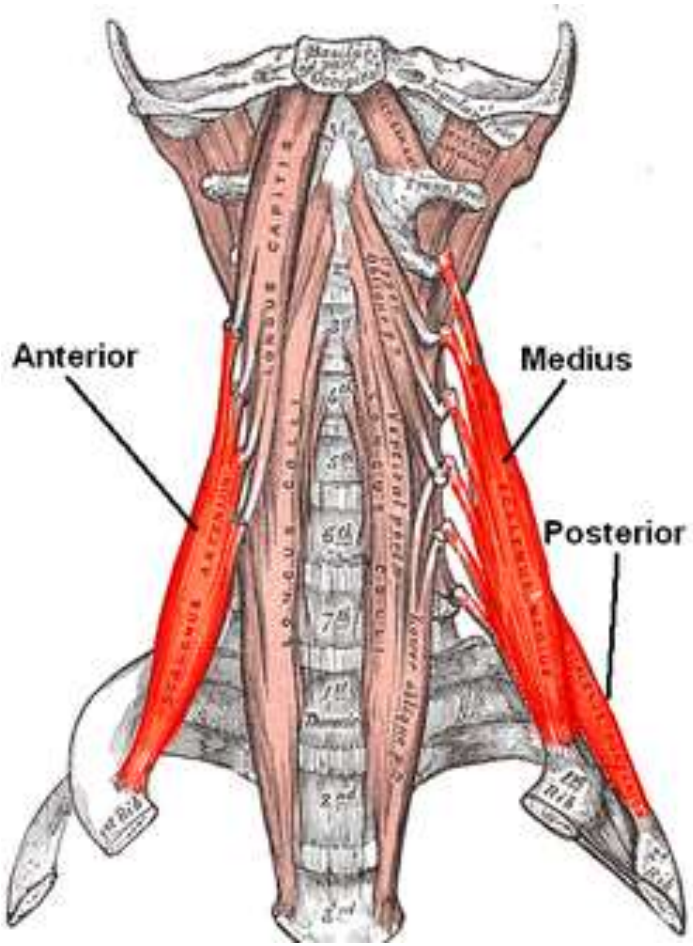
SCALENE MUSCLE

Middle Scalene

- The middle scalene is the largest and longest of the three scalene muscles. It has several long, thin muscles bellies arising from the cervical spine, which converge into one large belly that inserts into the first rib.
- **Attachments**: Originates from the posterior tubercles of the transverse processes of C2-C7, and attaches to the scalene tubercle of the first rib.
- **Function**: Elevation of the first rib. Ipsilateral contraction causes ipsilateral lateral flexion of the neck.
- **Innervation**: Anterior rami of C3-C8.

Scalene Muscles

Middle scalene



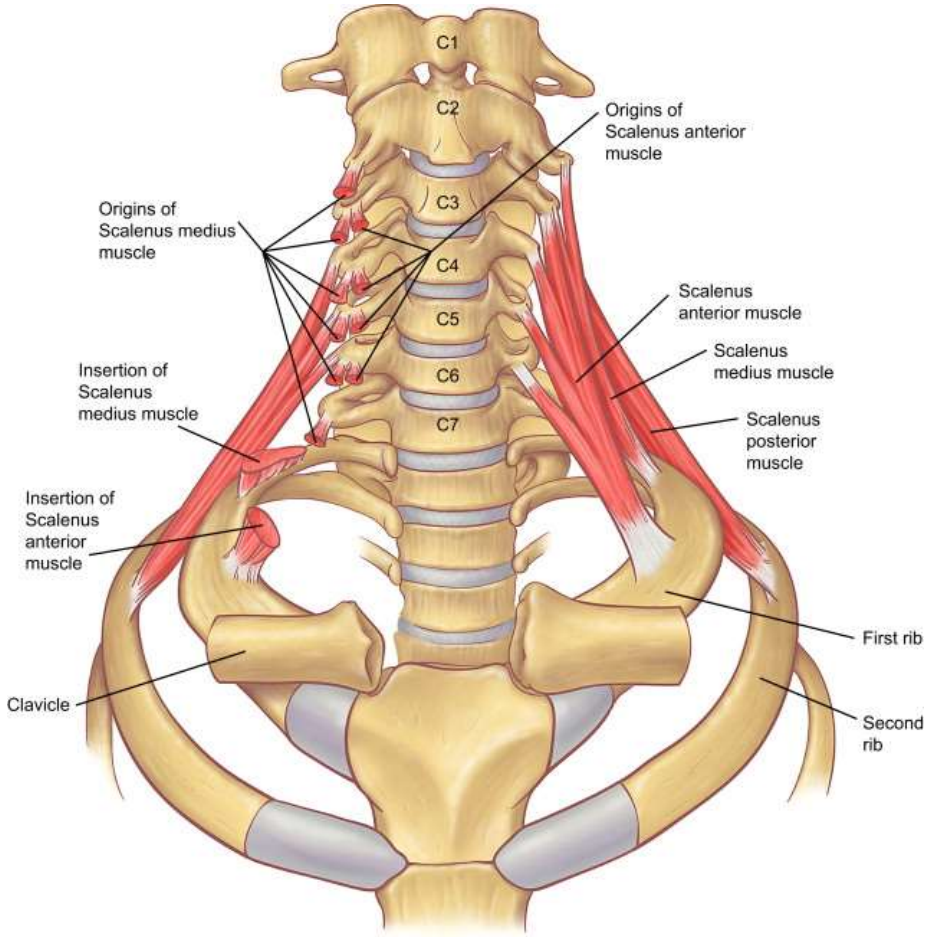
SCALENE MUSCLE

Posterior Scalene

- The posterior scalene is the smallest and deepest of the scalene muscles. Unlike the anterior and middle scalene muscles, it inserts into the second rib.
- **Attachments**: Originates from the posterior tubercles of the transverse processes of C5-C7, and attaches into the second rib.
- **Function**: Elevation of the second rib, and ipsilateral lateral flexion of the neck.
- **Innervation**: Anterior rami of C6-C8.

Scalene Muscle

Posterior Scalene



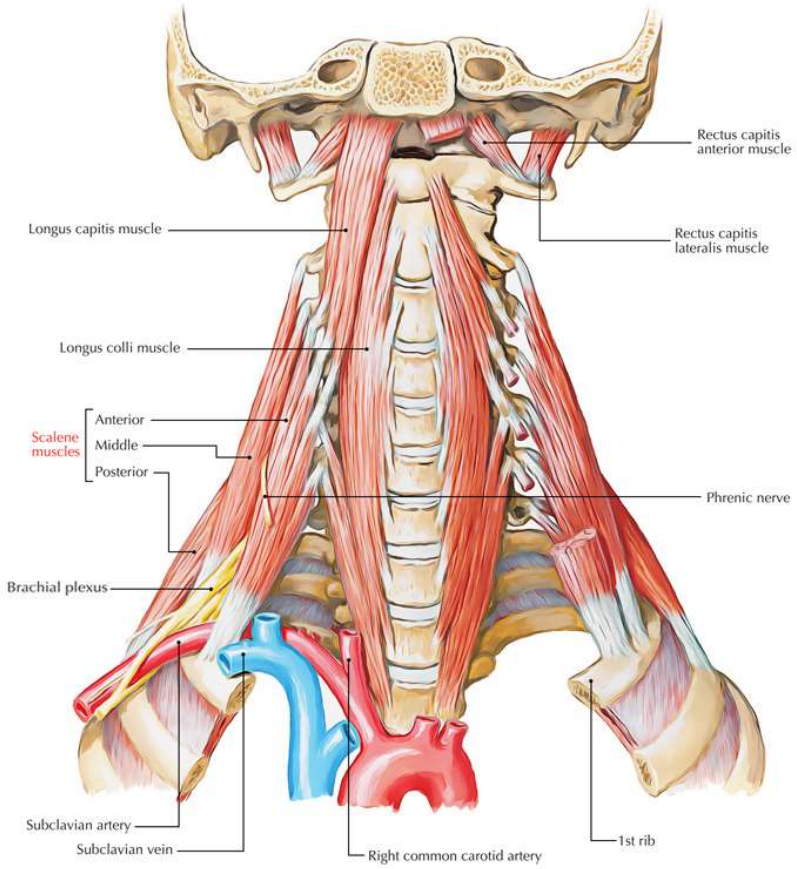
SCALENE MUSCLE

Anatomical Relationships

- The **scalene muscles** are an important part of the anatomy of the neck, with several important structures located between and around them.
- The brachial plexus and subclavian artery pass between the anterior and middle scalene muscles. This provides an important anatomical landmark in anaesthetics for performing an **interscalene block**.
- The **subclavian vein** and phrenic nerve pass anteriorly to the anterior scalene – the subclavian vein courses horizontally across it, while the phrenic nerve runs vertically down the muscle. The subclavian artery is located posterior to the anterior scalene.

Scalene Muscle

Relations



SCALENE MUSCLE

Accessory Muscles of Respiration

- The scalene muscles collectively act to elevate the first and second ribs, and in doing so they increase the **intrathoracic volume**. In patients with respiratory distress, the scalene muscles may be used as 'accessory muscles of respiration' to aid with breathing.
- By increasing intrathoracic volume, the patient can ventilate their lungs more effectively. However, they are not required in the respiration of a healthy individual, and so the use of accessory muscles is an important clinical sign of **respiratory distress**.

SCALENE MUSCLE

Clinical Relevance of the Scalene Muscles

Interscalene block

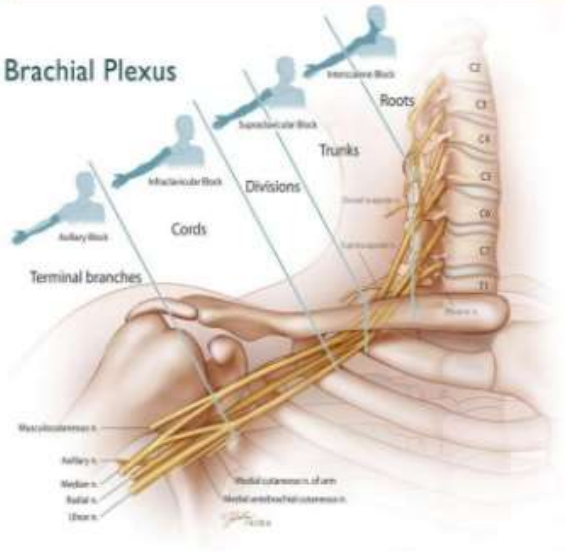
- The brachial plexus courses between the bellies of the anterior scalene and middle scalene muscles. In upper limb surgery, the brachial plexus can be infiltrated with local anaesthetic to avoid the use of a general anaesthetic – known as an **interscalene block**.
- To do this, local anaesthetic is injected between these muscles at the level of the **cricoid cartilage**.

Scalene Muscles

Regional Nerve Block

Brachial Plexus Anatomy

17



- Interscalene block
  - At level of Distal Roots/ Proximal Trunks

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