



NECK TRIANGLES, MUSCLES, VERTEBRA

DR. CHRISTOPHER JOSEPH OROZCO | 08/03/2026

OUTLINE

I. Neck	IV. Cervical Ligaments
A. Surface Anatomy	V. Deep Muscles of Neck
II. Bones of the Neck	VI. Root of the Neck
A. Cervical Vertebrae	
1. C1	
2. C2	
3. C3	
B. Hyoid	
III. Muscle of the Neck	
A. Platysma	
1. Sternocleidomastoid Region	
2. Posterior Cervical Region	
3. Lateral Cervical Region	
4. Anterior Cervical Region	
a. Muscles of the Anterior Cervical Region	
B. Fascia of the Neck	

LEGENDS

Must know	Lecturer	Book	Presentation	Old Trans
!	👤	📖	💻	📝

LEARNING OBJECTIVES

At the end of the lecture, the student should be able to:

- ✓ To learn the bones of the neck as to:
 - A. Morphology
 - cervical vertebrae
 - hyoid
 - B. Articulations
- ✓ To learn the superficial muscles of the neck as to origins, insertions, actions and innervation.
- ✓ To learn the fascia of the neck
- ✓ To learn the deep muscles of the neck as to origin(s), insertion(s), action(s) and innervation
- ✓ To learn the root of the neck

NECK

- Transition between cranium and clavicles
- Joins the head to the trunk and limbs
- Major conduit for structures
 - Important organs with unique functions
 - 👤 This is where the esophagus passes
 - 👤 Several blood vessels passing to and from the head
- Known region of vulnerability
 - lack bony protection
- Formed by cervical vertebrae, hyoid bone, manubrium, and clavicles
- Parts of the axial skeleton except the clavicles

A. SURFACE ANATOMY

- Lesser supraclavicular fossa overlies the inferior end of IJV
 - Between the sternal and clavicular heads of SCM

- Trapezius defines the posterior cervical region
 - Overlies the sub-occipital region
 - Inferior to the attachment to external occipital protuberance
- Greater supraclavicular fossa: inferior to the inferior belly of omohyoid
 - Depression overlying the omo-clavicular triangle
 - 3rd part of subclavian artery passes through before coursing posterior to the clavicle
 - Subclavian arterial pulsations can be palpate
- Cervical viscera and carotid arteries are approached surgically through the anterior cervical region
- Submandibular gland nearly fills the submandibular triangle
 - Palpable as soft mass inferior to the body of mandible
 - Lymph nodes lie superficial to the gland
- Carotid arterial system is located in the carotid triangle
 - Important for surgical approaches to the carotid sheath
 - Contains common carotid artery, IJV, and CN X
 - Also contains the cervical sympathetic trunk and CN XII
- Skin is thin and pliable
- Subcutaneous tissue contains the **platysma**
 - Thin sheet of striated muscle ascending to the face
- Jugular notch forms the inferior boundary of the fossa between the sternal heads of the SCMs
 - Suprasternal space and jugular venous arch are located superior to this notch

BONES OF THE NECK

A. CERVICAL VERTEBRAE

- Smallest of the movable vertebrae, small compared to thoracic and lumbar vertebrae
- Have large vertebral canal
 - Encloses spinal cord and meninges
- Vertebral bodies supports the head and the intervertebral articulations



- Provide head flexibility
 - Maximize the efficiency of sensory organs
- Characteristics of typical cervical vertebrae:
 - Small and wide vertebral body
 - Concave superiorly; convex inferiorly
 - Large and triangular vertebral foramen

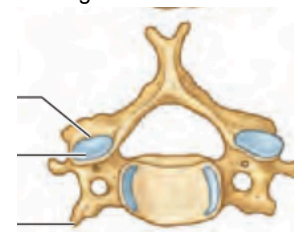


Fig.1 C3-C6

- All are characterized by a foramen in each transverse process
- Superior facets of the articular processes are directed supero-posteriorly, and the inferior facets are directed infero-posteriorly
- Spinous processes are short

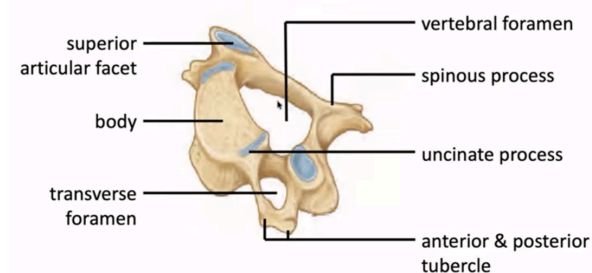


Fig.2 Superior oblique view of typical cervical vertebra

C1 Vertebra

- Ring-like, kidney-shaped
- Lacks spinous process and body
 - consists of two lateral masses connected by anterior and posterior arches
- Superior articular facets receive the occipital condyles



Fig.3 Atlas (C1)

C2 Vertebra

- With peg-like dens projecting superiorly

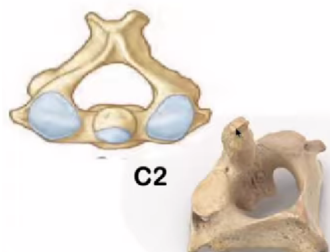


Fig.4 Axis (C2)

C7 Vertebra

- With long spinous process
- Large transverse processes; small foramen transversarium

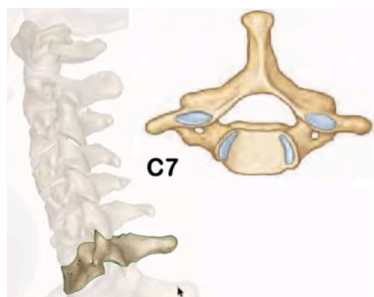


Fig.5 C7

B. HYOID (Gr. Hyoeidcs)

- Mobile; isolated from the rest of the skeleton
- Lies anterior between mandible and thyroid cartilage
- Suspended by muscular connections
- For attachment of anterior neck muscles

- Keep the airway open
- Middle part of **body** face anteriorly
 - Convex anteriorly; projects antero-superiorly
 - Concave posteriorly; projects postero-inferiorly
 - Each end is united to a greater horn
- **Greater horn** projects postero-superiorly and laterally from the body
 - In the young, fibrocartilage unite these to the body
 - In the elderly, these usually have bony union
- **Lesser horn:** a small bony projection from the superior part of the body
 - Connected to the body and, sometimes, to the greater horn by a synovial joint
 - Projects supero-posteriorly toward styloid process
 - Partly or completely cartilaginous in adults

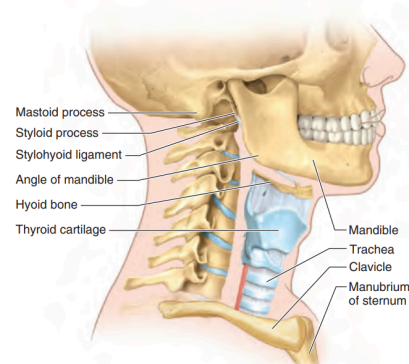
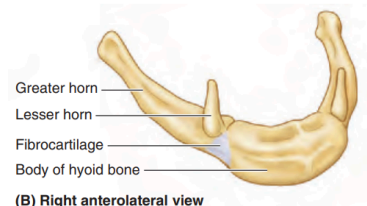
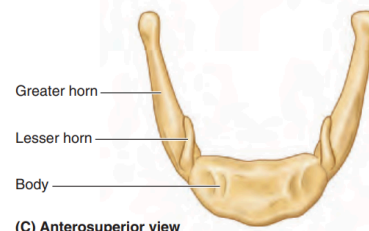


Fig. 6 Hyoid



(B) Right anterolateral view



(C) Anterosuperior view

Fig. 7 Right Anterolateral View and Anterosuperior View

MUSCLE OF THE NECK

A. PLATYSMA

- A broad sheet of muscle from the fascia covering the upper parts of pectoralis major and deltoid
- Fibers cross the clavicle, ascending on the side of neck
- Fibers interlace on the midline with contralateral muscle, below and behind the symphysis menti
 - Other fibers attach to lower border of mandible, lower lip, skin/subcutaneous tissue of lower face
- Blood supply is from submental branch of facial artery and by suprascapular artery
 - This muscle and its blood supply goes with careful elevation of myocutaneous flap in subplatysmal plane
 - Minimizes skin necrosis and wound breakdown
- Innervation is by the cervical branch of the facial nerve
- Neck is divided into regions for a clear description of location of structures, injuries, or pathologies
- Divided into **four major regions** between the cranium and clavicles, based on SCM and trapezius muscles

FIRST REGION: STERNOCLEIDOMASTOID (SCM) MUSCLE

- Broad and strap-like
- A landmark in the neck
- Forms the sternocleidomastoid region
- Divides the neck into anterior and lateral cervical regions
- Superiorly attach to mastoid process and superior nuchal line
- Has two heads:
 - Sternal head: rounded tendon
 - Slavicular head: thick & fleshy
- *Lesser supraclavicular fossa*: a small triangular depression
 - Separates the two heads inferiorly
- Produce movement at the cranio-vertebral joints, the cervical intervertebral joints, or at both
- Cranial attachments lie posterior to the axis of the atlanto-occipital joints
- Acting alone, each sternocleidomastoid tilt the head towards the ipsilateral shoulder
 - Simultaneously rotates the head

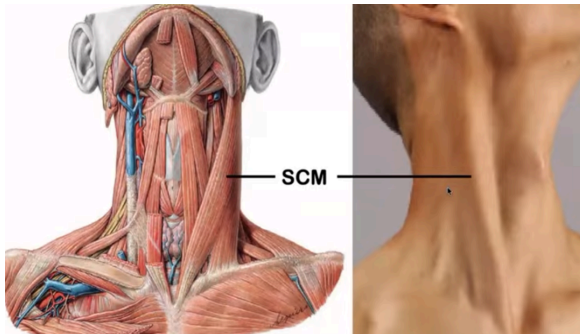


Fig. 8 Sternocleidomastoid Muscle

- Acting together from below, it draws the head forwards
 - Help the deep muscle (longi colli) flex the cervical vertebral column
 - A common movement in feeding
 - In supine, used to raise the head
- When head is fixed, these elevate the thorax during forced inspiration
 - Act as accessory muscles of respiration
 - Elevates the clavicles, manubrium, and anterior ribs
- Acting antagonistically with extensors of the neck, these flex the lower neck while producing limited extension at atlanto-occipital joint and upper neck

SECOND REGION: POSTERIOR CERVICAL REGION

- Posterior to the trapezius
- Sub-occipital region is deep to the superior part of this region
- Posterior to the trapezius

TRAPEZIUS

- A large, superficial, flat triangular muscle
 - 🗣️ Triangular muscle kasi we are just pertaining to one size, kapag pinagsama mo na sila triangle + triangle magiging diamond
- Axio-appendicular muscle
 - 🗣️ Axial meaning center, appendicular sa sides. Axial appendicular kasi naka attach sya dito sa may neck at dahil siya ay diamond shape/triangular shape mag extend sya hanggang dun sa may scapular area which is a part of appendicular muscle
- Cervical muscle that produce movement of cranium
- Attaches the pectoral girdle to cranium and vertebral column

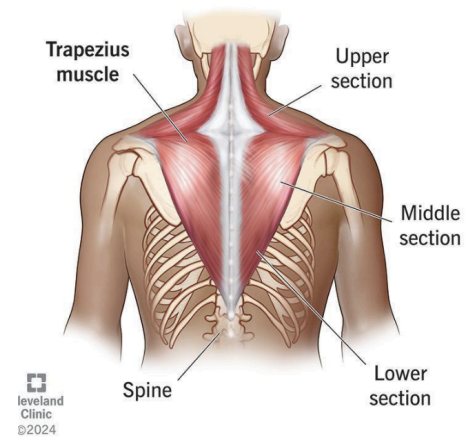


Fig. 9 Trapezius Muscle

THIRD REGION: LATERAL CERVICAL REGION

- posterior triangle
- it is wrapped like a spiral
- bounded by:
 - posterior border of SCM anteriorly
 - anterior border of trapezius posteriorly
 - middle 3rd of clavicle inferiorly
- apex is where SCM and trapezius meet

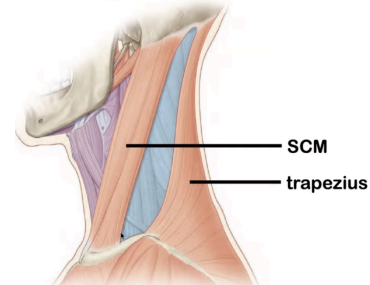


Fig. 10. Lateral cervical region.

- roofed by investing layer of deep cervical fascia
- floor is formed by prevertebral fascia
 - overlies splenius capitis, levator scapulae, middle and posterior scalene
- covered by skin and subcutaneous tissue with the platysma
- divided by the inferior belly of omohyoid into *occipital triangle* and *omo-clavicular triangle*

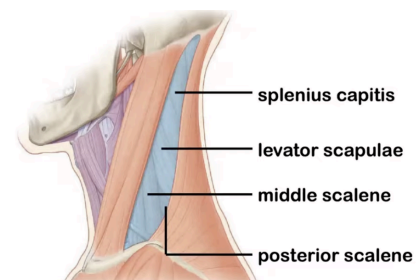


Fig. 11. Floor of the lateral cervical region.

1. OCCIPITAL TRIANGLE
 - larger, located superiorly
 - 🗣️ Inferior belly of the hyoid
 - occipital artery appears in its apex
 - spinal accessory nerve is the most important nerve crossing this region
2. OMO-CLAVICULAR TRIANGLE
 - indicated by supraclavicular fossa
 - crossed by the inferior part of the EJV; subclavian artery lies deep within

- investing layer of deep cervical fascia separates these vessels
- often called the subclavian triangle

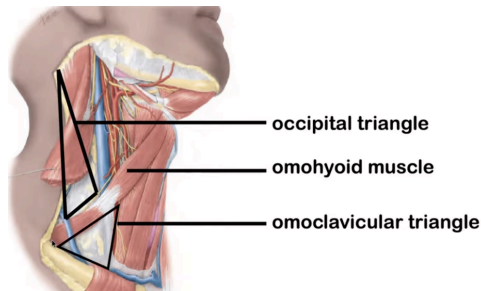


Fig. 12. Occipital Triangle And Omo-Clavicular Triangle.

FOURTH REGION: ANTERIOR CERVICAL REGION

- bounded by:
 - anteriorly: midline of the neck
 - posteriorly: anterior border of SCM
 - superiorly: inferior border of mandible
- apex is located at the jugular notch
- subcutaneous tissue forms the roof
- pharynx, larynx, and thyroid gland forms the floor
- subdivided into four smaller triangles:

1. SUBMENTAL TRIANGLE

- inferior to the chin
- bounded by:
 - inferiorly: body of the hyoid
 - laterally: anterior bellies of the digastric muscles
 - floor: the two mylohyoid muscles, meeting in a median fibrous raphe
 - apex: union of the halves of the mandible

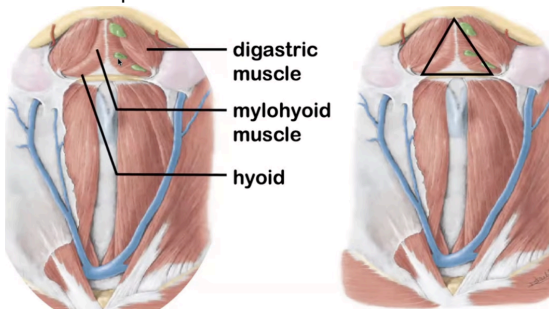


Fig. 13. Submental Triangle.

2. SUBMANDIBULAR TRIANGLE

- bordered by:
 - inferior border of mandible
 - anterior and posterior bellies of digastric muscle
- floored by the mylohyoid and hyoglossus and middle pharyngeal constrictor muscles
- a glandular area
 - It is because it is completely occupied by the submandibular gland
- submandibular LN lie on each side of submandibular gland
- passed by CN XII, nerve to the mylohyoid, parts of facial artery and vein, and the submental artery

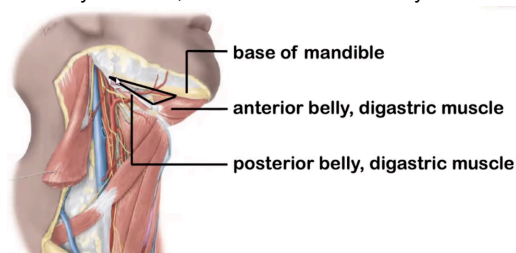


Fig. 14. Submandibular Triangle.

3. CAROTID TRIANGLE

- bounded by:
 - superior belly of the omohyoid
 - posterior belly of the digastric
 - anterior border of the SCM
- a vascular area
 - Due to the carotid artery
- pulses can be auscultated or palpated against the cervical vertebrae
- located within are:
 - **carotid sinus:** dilatation of internal carotid artery
 - **carotid body:** a small, ovoid mass of tissue deep into the bifurcation of common carotid
- neurovascular structures within the carotid sheath:
 - carotid arteries medially
 - IJV laterally
 - vagus nerve posteriorly
- ansa cervicalis lies on (or is embedded in) the antero-lateral aspect of the sheath
- many deep cervical lymph nodes lie along the carotid sheath and the IJV

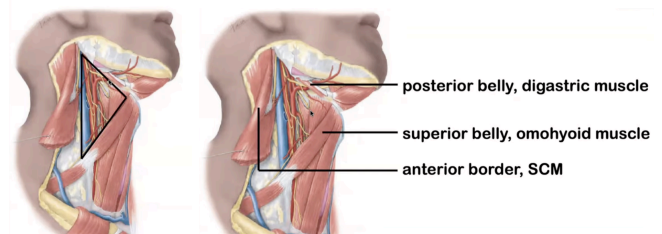


Fig. 15. Carotid Triangle.

4. MUSCULAR TRIANGLE

- inferior to the chin
- bounded by:
 - superior belly of the omohyoid muscle
 - anterior border of the SCM
 - median plane of the neck
- contains the infrahyoid muscles and viscera

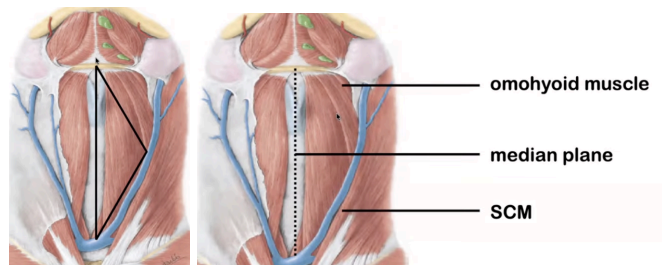


Fig. 16. Muscular Triangle.

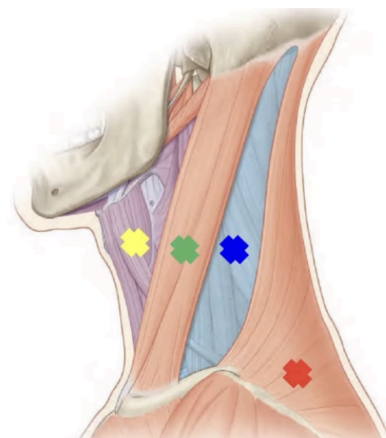


Fig. 17. Regions of the neck.

YELLOW: anterior region
 GREEN: Sternocleidomastoid region
 BLUE: lateral cervical region
 RED: posterior cervical region

MUSCLES OF THE ANTERIOR CERVICAL REGION

• HYOID MUSCLES

- Steady or move the hyoid and larynx
- divided into:
 - **suprahyoid muscles:** superior to the hyoid and connect it to the cranium
 - mylohyoid, geniohyoid, digastric, stylohyoid
 - forms floor of mouth, support the hyoid with swallowing and tone production
 - **infrahyoid muscles:** ribbon-like appearance
 - inferior to the hyoid
 - these muscles anchor the hyoid, sternum, clavicle, and scapula
 - depress the hyoid and larynx during swallowing and speaking
 - with suprahyoid muscles, these steady the hyoid
 - arranged in two planes:
 - superficial plane (sternohyoid and omohyoid)
 - deep plane (sternothyroid and thyrohyoid)

SUPRAHYOID MUSCLES

MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
Mylohyoid	Mylohyoid line of mandible	Mylohyoid raphe and body of hyoid	branch of inferior alveolar nerve	Elevates hyoid, floor of mouth, and tongue during swallowing and speaking
Geniohyoid	Inferior mental spine of mandible		C1 via hypoglossal nerve (CN XII)	Pulls hyoid antero-superiorly; shortens floor of mouth; widens pharynx
Stylohyoid	Styloid process of temporal bone	Body of hyoid	Stylohyoid (pre-parotid) branch of facial nerve (CN VII)	Elevates and retracts hyoid, thus elongating floor of mouth
Digastric	Anterior belly: digastric fossa of mandible	Intermediate tendon to body and greater horn of hyoid	Nerve to mylohyoid, a branch of inferior alveolar nerve	Working with infrahyoid muscles, depresses mandible against resistance; elevates and steadies hyoid during swallowing and speaking
	Posterior belly: mastoid notch of temporal bone		Digastric (preparotid) branch of facial nerve (CN VII)	

INFRAHYOID MUSCLES

MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
Sternohyoid	Manubrium of sternum and medial end of clavicle	Body of hyoid	C1–C3 by a branch of ansa cervicalis	Depresses hyoid after elevation during swallowing
Omohyoid	Superior border of scapula near supra-scapular notch	Inferior border of hyoid		Depresses, retracts, and steadies hyoid

MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
Sternothyroid	Posterior surface of manubrium	Oblique line of thyroid cartilage	C2 and C3 by a branch of ansa cervicalis	Depresses hyoid and larynx
Thyrohyoid	Oblique line of thyroid cartilage	Inferior border of body and greater horn of hyoid	C1 via hypoglossal nerve (CN XII)	Depresses hyoid and elevates larynx

FASCIA OF THE NECK

SUPERFICIAL CERVICAL FASCIA

- thin layer of connective tissue enclosing the platysma
- embedded within are cutaneous nerves, superficial veins and superficial lymph nodes

DEEP CERVICAL FASCIA

- supports the muscles, vessels, and viscera of the neck
- in certain areas, it is condensed to form well-defined, fibrous sheets
 - investing layer
 - pre-tracheal layer
 - pre-vertebral layer
- also form the carotid sheath

1. INVESTING LAYER

- a thick layer encircling the neck
- splits to enclose the trapezius and the SCM muscles

2. PRE-TRACHEAL LAYER

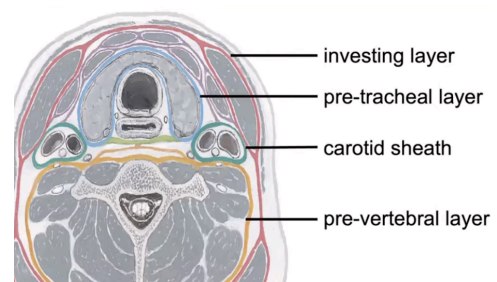
- a thin layer attaching to the laryngeal cartilages
- surrounds, and forms a sheath, for the thyroid and parathyroid glands
- encloses the infrahyoid muscles

3. PRE-VERTEBRAL LAYER

- a thick layer passing across the neck
 - behind the pharynx and the esophagus
 - in front of the pre-vertebral muscles and the vertebral column
- forms the fascial floor of posterior triangle
- extends laterally over the 1st rib into the axilla to form the axillary sheath

4. CAROTID SHEATH

- local condensation of the pre-vertebral, the pre-tracheal, and the investing layers
- surrounds:
 - common and internal carotid arteries
 - internal jugular vein
 - vagus nerve
 - deep cervical lymph nodes



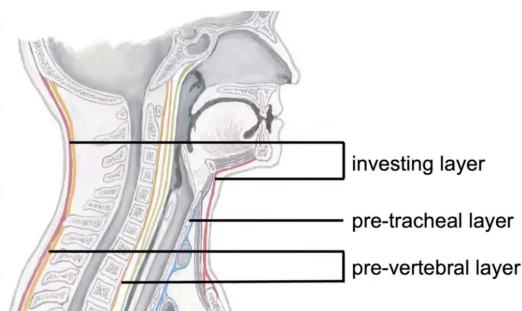


Fig. 18. Deep Cervical Fascia.

CERVICAL LIGAMENTS

- **STYLO-HYOID LIGAMENT** connects the styloid process to the lesser cornu of hyoid bone
- **STYLO-MANDIBULAR LIGAMENT** connects the styloid process to the angle of mandible
- **SPHENO-MANDIBULAR LIGAMENT** connects the spine of sphenoid bone to the lingula of mandible

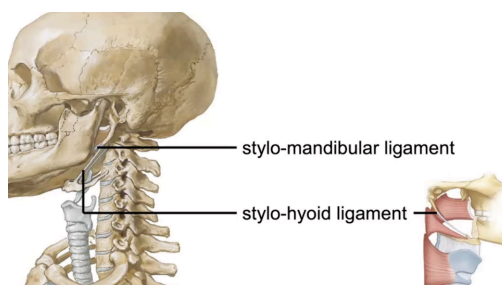


Fig. 19. Cervical Ligaments.

DEEP MUSCLES OF NECK

- the pre-vertebral muscles
 - anterior and lateral vertebral muscles
 - deep to pre-vertebral layer of deep cervical fascia
- located posterior to the cervical viscera
- antero-lateral to the cervical vertebral column

1. ANTERIOR VERTEBRAL MUSCLES

- longus colli and capitis, rectus capitis anterior & anterior scalene muscles
 - posterior to the retropharyngeal space
 - medial to the neurovascular plane of cervical and brachial plexuses and subclavian artery

2. LATERAL VERTEBRAL MUSCLES

- rectus capitis lateralis, splenius capitis, levator scapulae, and middle and posterior scalene muscles
 - posterior to the neurovascular plane
 - except for rectus capitis lateralis, form the floor of the lateral cervical region

ANTERIOR VERTEBRAL MUSCLES				
MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
Longus colli	Anterior tubercle of C1 vertebra (atlas); bodies of C1-C3 and transverse processes of C3-C6 vertebrae	Bodies of C5-T3 vertebrae; transverse processes of C3-C5 vertebrae	Anterior rami of C2-C6 spinal nerves	Flexes neck with rotation (torsion) to opposite side if acting unilaterally

Longus capitis	Basilar part of occipital bone	Anterior tubercles of C3-C6 transverse processes	Anterior rami of C1-C3 spinal nerves	Flex head
Rectus capitis anterior	Base of cranium, just anterior to occipital condyle	Anterior surface of lateral mass of atlas (C1 vertebra)	Branches from loop between C1 and C2 spinal nerves	
Anterior scalene	Transverse processes of C3-C6 vertebrae	1st rib	Cervical spinal nerves C4-C6	

LATERAL VERTEBRAL MUSCLES				
MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
Rectus capitis lateralis	Jugular process of occipital bone	Transverse process of atlas (C1 vertebra)	Branches from loop between C1 and C2 spinal nerves	Flexes head and helps stabilize it
Splenius capitis	Inferior half of nuchal ligament and spinous processes of T1-T6 vertebrae	Lateral aspect of mastoid process and lateral third of superior nuchal line	Posterior rami of middle cervical spinal nerves	Laterally flexes and rotates head and neck to same side; acting bilaterally, extends head and neck
Levator scapulae	Posterior tubercles of transverse processes C2-C6 vertebrae	Superior part of medial border of scapula	Dorsal scapular nerve C5, and cervical spinal nerves C3 and C4	Downward rotation of scapula and tilts its glenoid cavity inferiorly by rotating scapula
Middle scalene	Posterior tubercles of transverse processes of C5-C7 vertebrae	Superior surface of 1st rib; posterior to groove for subclavian artery	Anterior rami of cervical spinal nerves	Flexes neck laterally; elevates 1st rib during forced inspiration
Posterior scalene		External border of 2nd rib	Anterior rami of cervical spinal nerves C7 and C8	Flexes neck laterally; elevates 2nd rib during forced inspiration

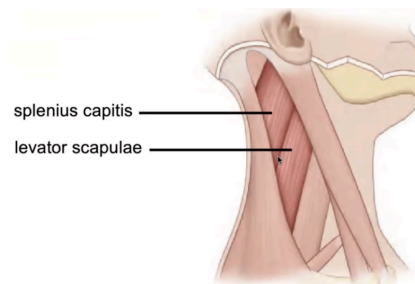
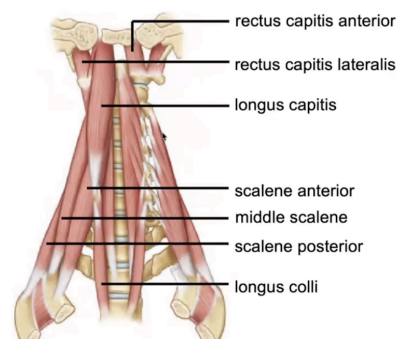


Fig. 20 Deep Muscles Of Neck.

ROOT OF THE NECK

- junctional area between the thorax and neck
- superior thoracic aperture: structures pass between the thorax and the head or upper limb

- bounded by
 - laterally: 1st pair of ribs and costal cartilages
 - anteriorly: manubrium
 - posteriorly: body of T1 vertebra

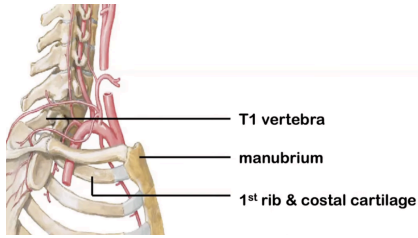


Fig. 20. Root of the Neck.

REFERENCES

1. Moore, K. L., Dalley, A. F., II., & Agur, A. M. R. (2014). Clinically oriented anatomy (7th ed.). Lippincott Williams & Wilkins.
2. Doc Orozco (2026). Neck Triangles, Muscles, Vertebra [Lecture PPT]