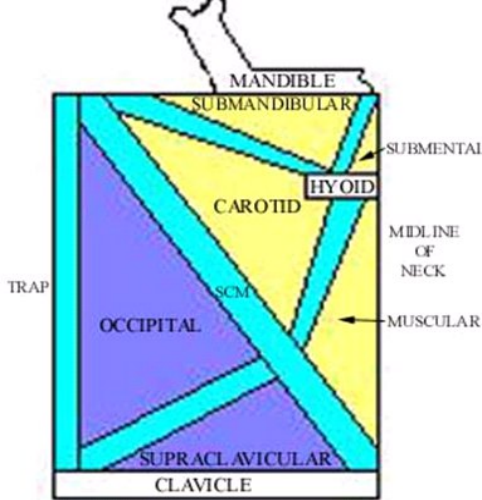




Triangles:

The **sternocleidomastoid** divides the neck into anterior and posterior triangles

The muscle itself is in neither triangle.

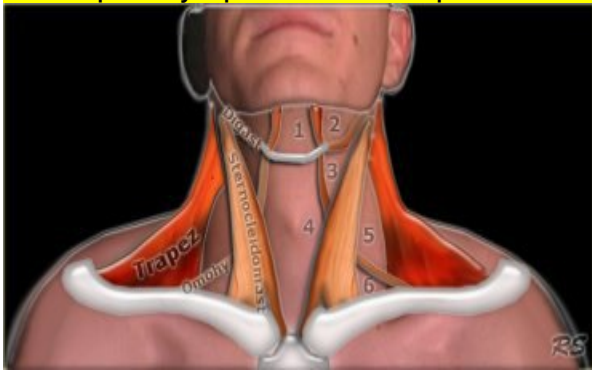
Using the **hyoid bone as a keystone**, the **superior belly of omohyoid & Digastric muscles** subdivided the anterior triangle into:

1. Submental triangle
2. Submandibular triangle
3. Muscular triangle
4. Carotid triangle

The **posterior** triangle is divided by the **inferior belly of the omohyoid muscle** into:

1. Occipital
2. Supraclavicular (Omoclavicular)

Note apical lymph node of the posterior triangle is enlarged in **rubella & scalp infection**



The boundaries of **submental** are

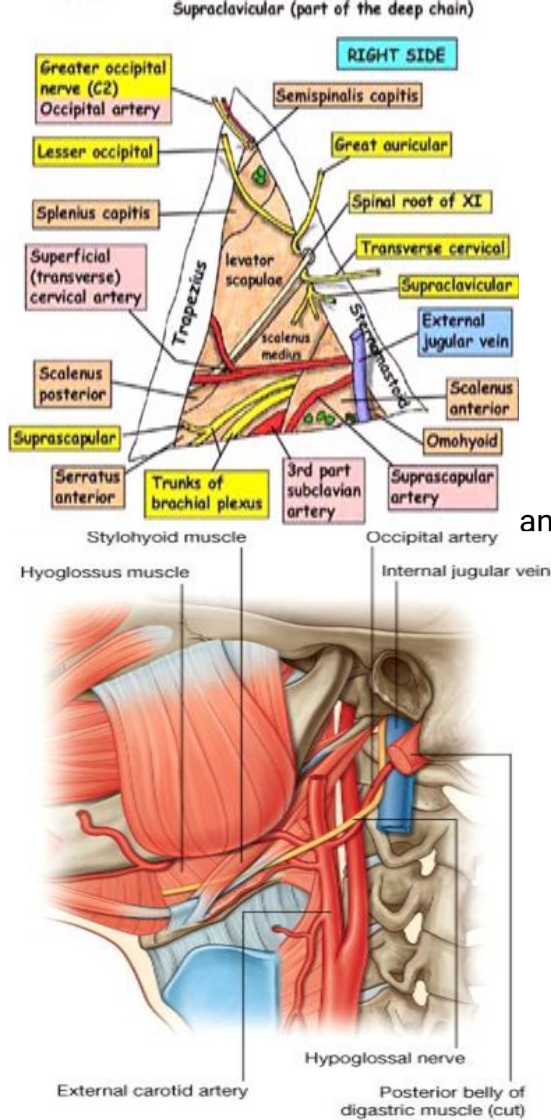
the anterior belly of the digastrics
midline
Hyoid bone.

The boundaries of **submandibular/digastrics** are:

anterior & posterior belly of digastrics muscle
base of the mandible
line from the angle of the mandible to the mastoid process

The boundaries of **muscular**:

hyoid bone

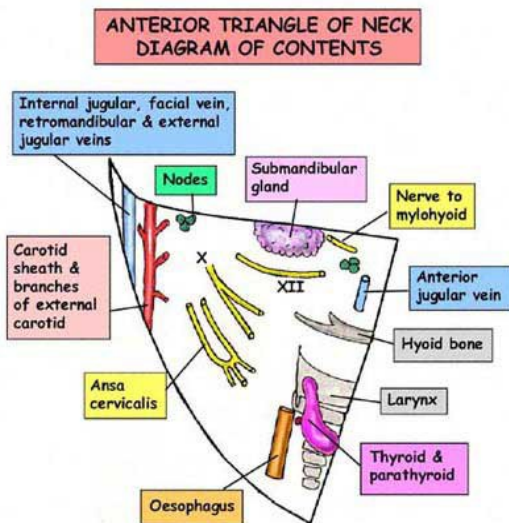


anterior belly of omohyoid

anterior border of scm

midline

the boundaries of **supraclavicular**:
posterior surface of scm
clavicle



posterior belly of omohyoid

Hypoglossal nerve course in the neck:

Moves from the carotid triangle into the submandibular triangle

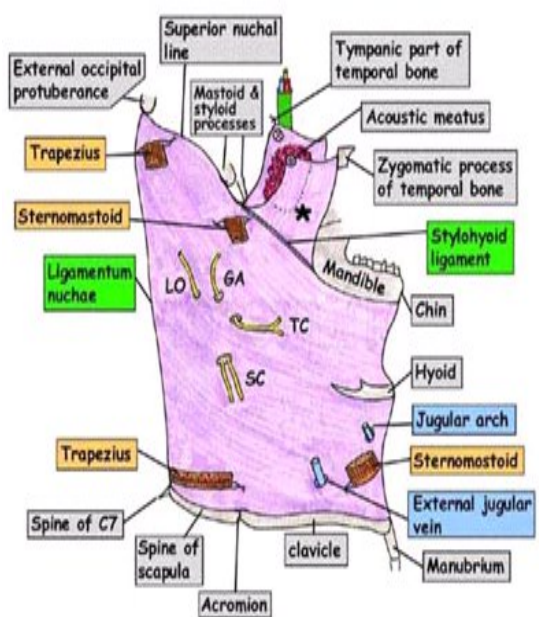
Medial to:

- o stylohyoid insertion
- o posterior belly of digastrics
- o mylohyoid

Lateral to:

- o Hypoglossal muscle

Triangle	Blood vessel	Nerves	Special structures
Sub-mental	Anterior jugular v		Submental salivary gland
Submandibular / Digastrics	Facial artery & v Submental a & v	Marginal mandibular branch of facial nerve Mylohyoid branch of V3 Hypoglossus	Submandibular gland Inferior portion of parotid gland
Carotid	Common carotid Internal carotid External carotid & its branches except the terminal & posterior auricular Internal jugular	Vagus nerve External & internal laryngeal branches Small part of Accessory nerve Hypoglossus glossopharyngeal	
Muscular	Lower part of the carotid sheath Superior thyroid artery Anterior jugular vein	Anas cervicalis External & internal laryngeal branches	Strap muscles, Thyroid gland, Parathyroid, Larynx, Trachea, esophagus
Occipital	Occipital artery Transverse cervical a	Spinal root of Accessory nerve Cervical plexus: - o Greater & lesser occipital - o Greater auricular - o Transverse occipital - o suprascapular	
Supra-clavicular	Subclavian vessels Thyrocerical trunk Suprascapular a External jugular vein	Brachial plexus	Pleura



★ Anterior layer of parotid fascia is the superficial layer of the investing fascia that has split from the stylohyoid ligament

⊗ Posterior layer of parotid fascia is the deep layer of the investing fascia that has split from the stylohyoid ligament. It fuses with the parotid gland

Fascia of the Neck:

1. Superficial cervical fascia
2. The deep cervical fascia:
 - a. superficial layer (investing): carotid sheath
 - b. middle, pretracheal or visceral layer:
 - 1) muscular/**infra**-hyoid portion
 - 2) pretracheal
 - 3) buccopharyngeal
 - a. deep layer or prevertebral:
 - 1) alar layer
 - 2) prevertebral division

1. Superficial cervical Fascia:

Lies deep to the dermis layer of the skin

Thin layer that invests the platysma muscle & muscles of facial expressions

It is closely associated with adipose tissue.

It contains cutaneous nerve

This fascia is penetrated by the blood vessels that supply the neck skin.

The subplatysmal flap therefore protects the blood supply to the skin.

1. Deep cervical Fascia:

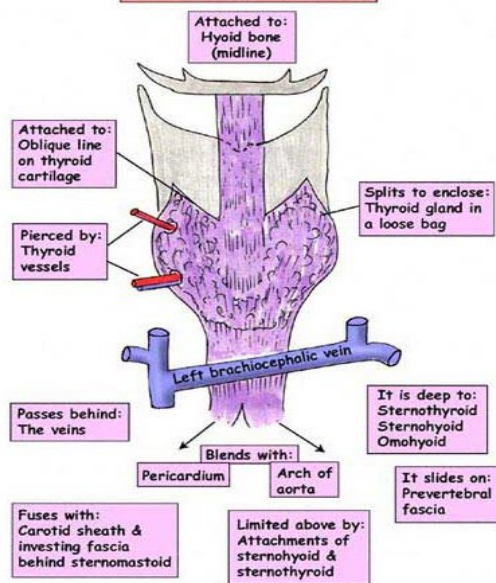
1) Superficial investing Fascia:

arise from:

- o ligamentum nuchae
- o spinous processes of the cervical vertebrae

It splits into anterior & posterior layer to enclose:

1. trapezius
2. omohyoid
3. sternocleidomastoid
4. parotid gland
5. submandibular gland



superior attachment is to :
 external occipital protuberance
 superior nuchal lines
 mastoid tip
 zygomatic arch

Anterior attachment: hyoid.

Inferior attachments: acromium, the clavicle and the sternum

The splitting of this fascial layer around the parotid forms a deep layer, which fuses with the fascia around the internal carotid artery.

It also forms the stylomandibular ligament (which separates the anterior inferior tip of the parotid gland from the submandibular gland).

Deep to this layer runs the spinal accessory nerve

Forms the roof of the posterior triangle

1) **Middle layer/ pretracheal /visceral layer:**

This is derived from the superior layer of the deep cervical fascia



Muscular portion : encircles the strap muscles

Pretrachea

passes **deep** to the **strap** muscles

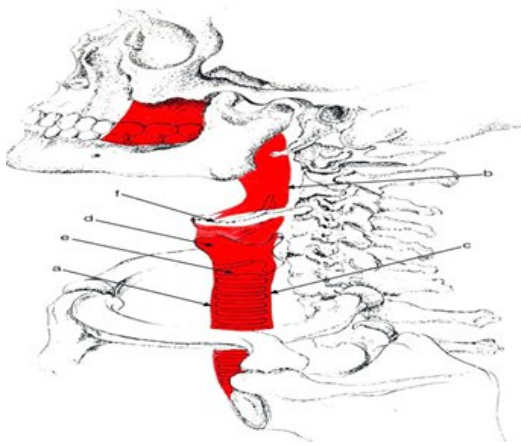
encircles: thyroid (**anterior** layer of the pretracheal fascia splits to encloses the thyroid cartilage), larynx, trachea, pharynx, oesophagus

Movement of the **hyoid** and **strap** muscles during **swallowing** elevates the **fascia** so that **thyroid** lumps characteristically move on deglutition.

buccopharyngeal fascia:

portion of the middle layer that is related to and **encloses the pharynx posteriorly**

Below the level of the pharynx it is called the **visceral** layer



covers the external surface of the **buccinator** and **superior** constrictor muscles (both muscles arise from the pterygomandibular raphe) Allow the pharynx to move freely, relative to neighbouring structures such as the carotid sheath and vertebrae.

Adheres **inferiorly** into the **pretracheal** & **visceral** fascia

Forms

- o midline raphe: through which Adheres at the midline to prevertebral fascia
- o pterygomandibular raphe : adheres to the lateral pharynx

Note: layers of the muscles:

- o facial expression: mastication: buccinators
- o Platysma: SCM , trapezius & omohyoid: strap muscle

1) **Deep Layer / pre-vertebral fascia:**

Forms a **tubular** sheath for the **vertebral column** and the **muscles**

Arises from the **ligamentum nuchae** and the **spinous** processes of the cervical vertebrae (like **investing** layer)

It forms the **floor** of the **posterior** triangles and allows the pharynx to glide during **deglutition**.

While the **investing** layer forms the **roof** of the **posterior** triangle

deep layer of deep cervical fascia (At the **transverse** processes of cervical spine) is divided into 2 distinct layers:

1. **The prevertebral fascia: (posterior)**

adheres to the anterior aspect of the vertebral bodies

extends from the skull base down the length of the spine

Extends laterally over the prevertebral musculature to fuse with the transverse processes and their attached ligaments.

It extends posteriorly to enclose the extensor musculature of the neck

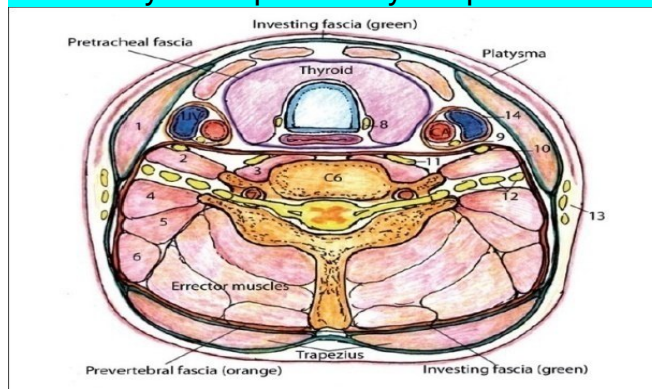
It is attached in the posterior midline to the spinous process of the vertebrae.

The prevertebral division forms:

the posterior wall of the so called danger space which extends from the skull base to the diaphragm

constitute the anterior wall of the prevertebral space.

Consequently, endogenous infections such as tuberculosis involving the vertebral bodies extend into the prevertebral space but not into the danger space, from which they are separated by the prevertebral fascia.



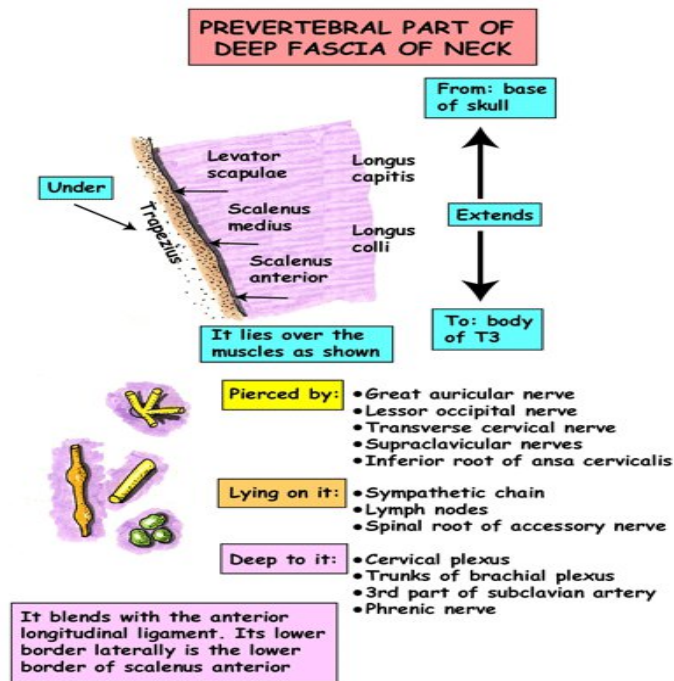
1. The alar fascia: (anterior)

lies between the prevertebral fascia and the visceral division of the middle layer of deep cervical fascia.

It courses from the transverse process to the contralateral transverse process vertically from the skull base to T2, where it fuses with the visceral layer of the middle layer of deep cervical fascia which lies in front of it. (This seals inferiorly the (retro)Pharyngeal space)

forms :

0



anterior wall of the danger space

o posterior lateral portion of the retropharyngeal space

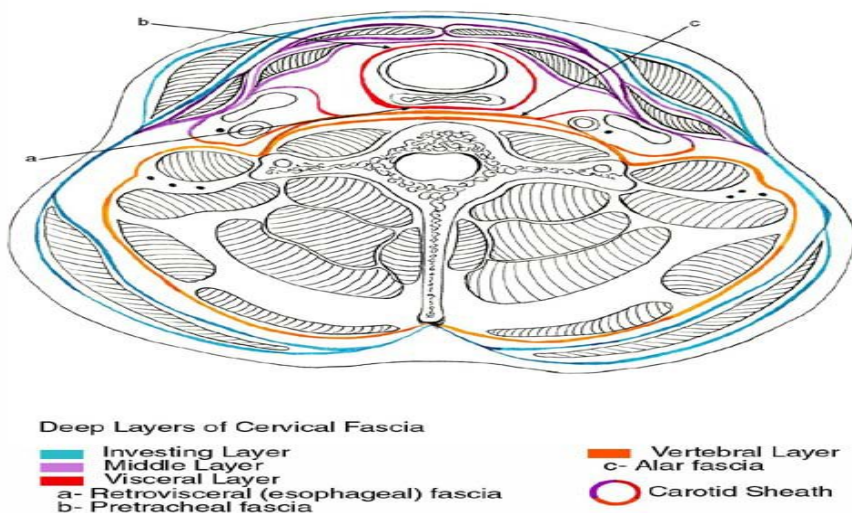
Carotid Sheath:

This is derived from the **superficial + middle + deep** layer of **deep** cervical fascia **medial** to the sternocleidomastoid

Extends from the **skull base** to the **adventitia** of the **aortic arch**

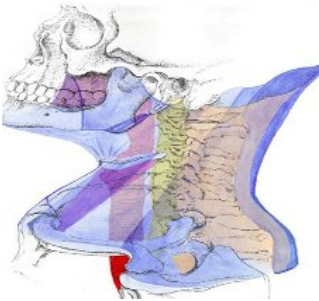
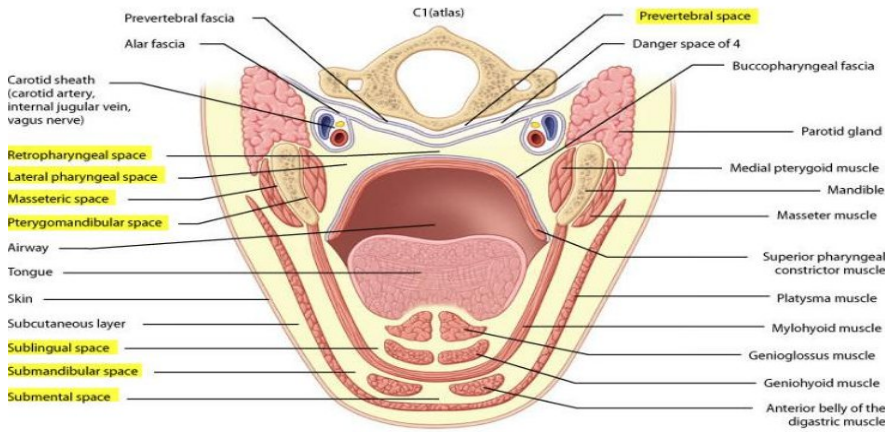
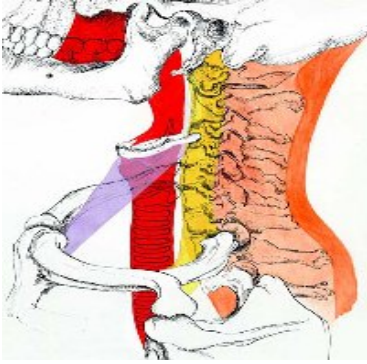
It contains **80 %** of the lymph nodes of the neck, the carotid arteries, the internal jugular vein, vagus nerve.

Constituents of the **anas cervicalis** are **embedded** in the carotid sheath



spread, called **Lincoln high** way of the neck

It is a potential venue for infection



	investing layer	Pre-vertebral fascia
Origin	the same: ligamentum nuchae and the spinous processes of the cervical vertebrae	
Relation to trapezoid muscle	Encloses the muscle	Deep to the muscle
Relation to the post triangle	Roof	Floor

NECK SPACES

Spaces involving entire length of neck:

Retropharyngeal space
Danger space
Prevertebral space
Visceral vascular space

Spaces limited to above the hyoid bone:

Parapharyngeal space
Submandibular space
Parotid space
Masticator space
Peritonsillar space
Temporal space

Spaces limited to below the hyoid bone:

Anterior visceral space
Suprasternal space

Knowledge of these potential neck spaces is important in the understanding of the spread of infection and tumors in the neck.

They contain only loose areolar fascia.

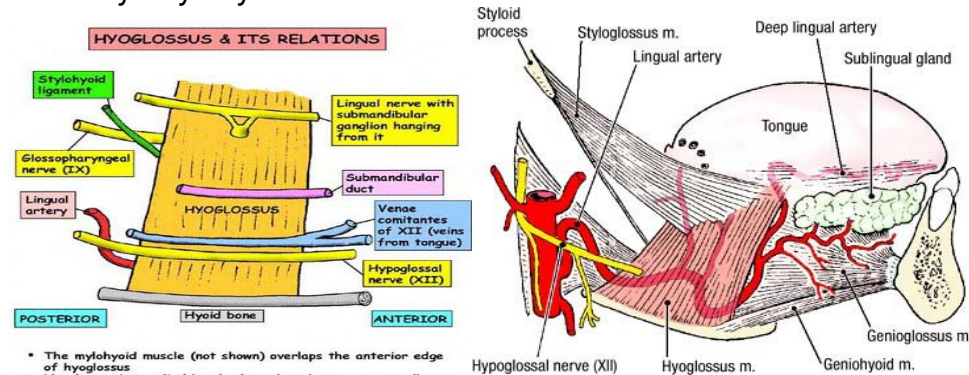
Spaces limited to the above of the hyoid

Sublingual space:

Boundaries:

Superiorly: floor of mouth and tongue

Inferiorly: mylohyoid muscle



* The mylohyoid muscle (not shown) overlaps the anterior edge of hyoglossus

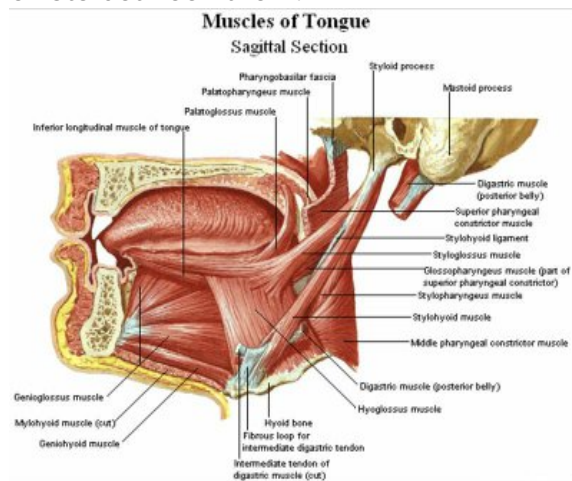
mandible

Posteriorly: hyoid bone

Medially: genioglossus, geniohyoid, and styloglossus muscles

Anteriorly and laterally:

This space communicates freely with that of the opposite side because no true fascial separation exists between them.



The sublingual space also communicates anteriorly with the submental space below through dehiscences in the mylohyoid muscle and raphe.

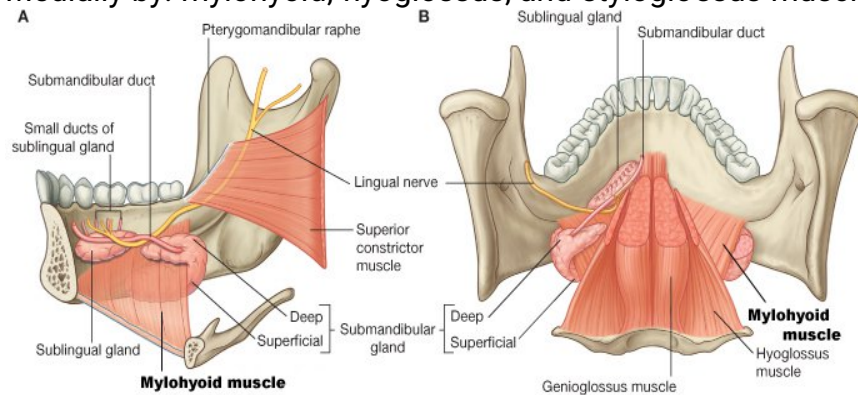
Get infections from: anterior teeth, bicuspsids, first molar tooth

Management: Intra-oral incision (but avoid the posteriolateral region which contains the lingual nerve)

Submandibular space

Boundaries:

Superiorly: separated from the sublingual space
Medially by: mylohyoid, hyoglossus, and styloglossus muscles



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Laterally by: body of the mandible.

Inferior boundary: anterior and posterior bellies of the digastric muscle

Posterior border: Stylomandibular ligament + posterior belly of digastric

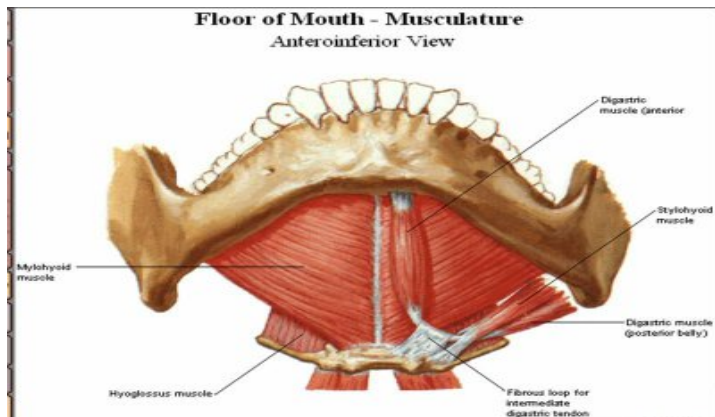
Lateral border: overlying skin, **superficial** layer of **deep** cervical fascia, platysma muscle

The contents of this space: tail of the submandibular gland, Wharton's duct, lingual nerve, hypoglossal nerves, facial artery, some lymph nodes and fat.

Note the submandibular gland lies in both the submandibular & sublingual space

Submental space (mylohyoid divides it into 2 parts)

Source of infection: infections of the 2nd and 3rd mandibular molar teeth



Clinically, a tense, ill-defined swelling is generally present below the mandible, which makes palpation of its inferior border difficult.

Management is by an external transverse cervical incision placed 2 finger breath beneath the body of the mandible to avoid injury to the mandibular nerve

Communication:

across midline: **opposite** submandibular space

Anteriorly: Communicate freely with the **submental space**

Midway: It communicates with the floor of mouth around the posterior border of the mylohyoid

Posteriorly: Communicate with the **parapharyngeal space**

It is subdivided by the mylohyoid muscle into : Sublingual, Submaxillary

Ludwig Angina

Definition: the collective involvement of the submandibular and sublingual spaces bilaterally and the submental space (spread by the facial planes not by the way of lymphatics)

Dental origin; arise from infections of the Mandibular molar teeth

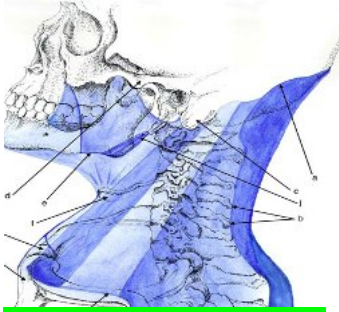
The causative organisms include a variety of aerobic and anaerobic gram-positive cocci (staph & strep) and gram-negative rods (bacteroid).

Clinically: collar of brawny edema extends across the entire upper anterolateral neck with elevation and progressive induration of the floor of the mouth

Since the **mandible** and **superficial** layer of deep cervical fascia provide **unyielding** barriers superiorly and laterally, the **tongue** is forced **upward and posteriorly** giving rise to **airway obstruction**. This is the most important danger in **Ludwig's angina** (rapidly spreading cellulitis involving the floor of the mouth)

Complications

1. Spread of infection to parapharyngeal and retropharyngeal spaces and hence to the mediastinum.
2. Airway obstruction due to laryngeal oedema, or swelling and pushing back of the tongue.
- 3.

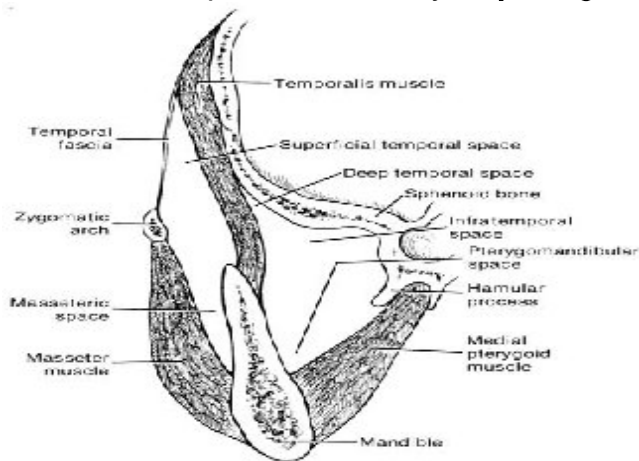


Septicaemia.

4. Aspiration pneumonia

Masticator space:

Collection of spaces defined by a **splitting** of the **investing** layer of the **deep** cervical fascia



, As it approaches the **mandible** and extends

superiorly:

- o temporal space
- o Masseteric space
- o pterygomandibular space

Boundaries:

- o **External:** fascia overlaying Masseter muscle
- o **Internal:** fascia medial to pterygoid muscle

Contents:

Masseter muscle, Medial & lateral pterygoid muscle

Ramus & posterior body of the mandible

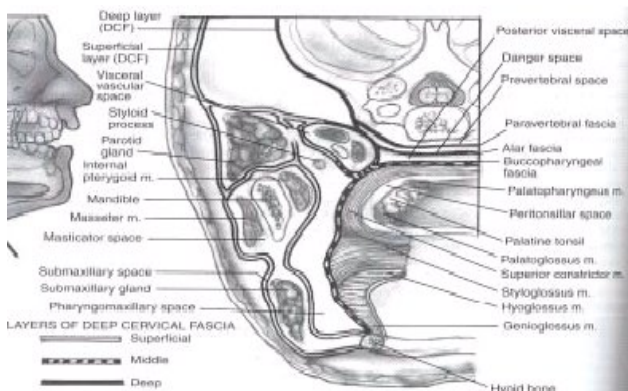
Tendon of insertion of Temporalis muscle

Inferior alveolar nerve (pterygomandibular space)

Internal maxillary artery (pterygomandibular space)

Infection source: mandibular/maxillary 3rd molar teeth

Involves **all** masticator muscles



Relation to other spaces:

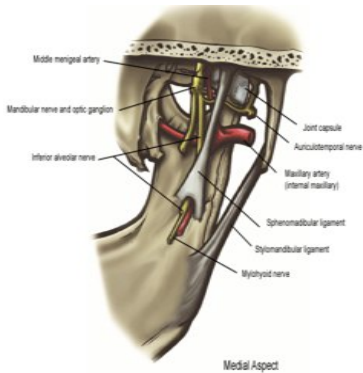
Lies anterior & lateral to the parapharyngeal space

Inferior to temporal space
Medial to the infratemporal space

Peritonsillar space:

This lies between the tonsil and **superior constrictor**.

It communicates through the fibres of the superior constrictor with retropharyngeal and parapharyngeal spaces.



Parapharyngeal /lateral space/pharyngomaxillary :

It is shaped like an inverted pyramid with the Base under temporal bone & apex in the neck at hyoid (C3)

Located on either side of the pharynx (Nasopharynx & oropharynx)

Borders:

superiorly: the base of skull (petrous part of temporal bone)

Inferior part: the greater cornu of the hyoid bone

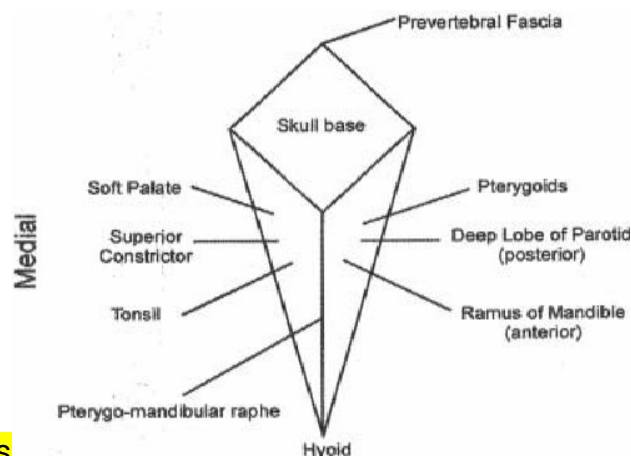
Medial Border:

lateral naso+oropharyngeal wall

Pharyngobasilar fascia

Tensor palatine

levator palatine



pharyngeal constrictors

Lateral border:

fascia covering medial pterygoid muscles

Ascending Ramus of the Mandible

Deep lobe of parotid gland

SCM at the level of C5

Anterior border: pterygomandibular raphe

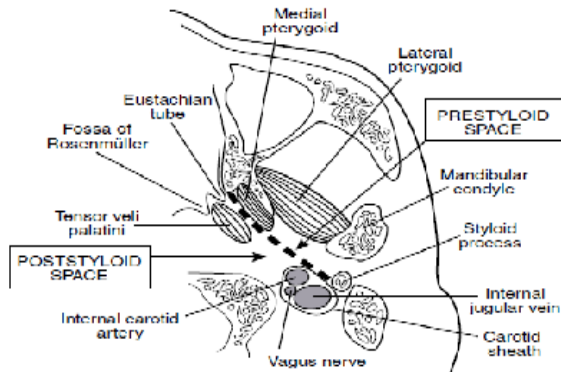
Posterior Border:

posterior part of the carotid sheath

Prevertebral fascia

Note:

parapharyngeal space has no anatomical floor, allowing communication from skull base to superior mediastinum



So infections can extend intracranially or into the

mediastinum

Middle ear infections can spread via involvement of the petrous apex or jugular foramen into the neck

Parapharyngeal abscess the approach is:

Anterior to the SCM for abscess low in the neck

Posterior to the SCM for abscess high in the neck

Fascial borders:

Medial: middle layer of deep fascia

Lateral: superficial layer of deep fascia (buccopharyngeal fascia)

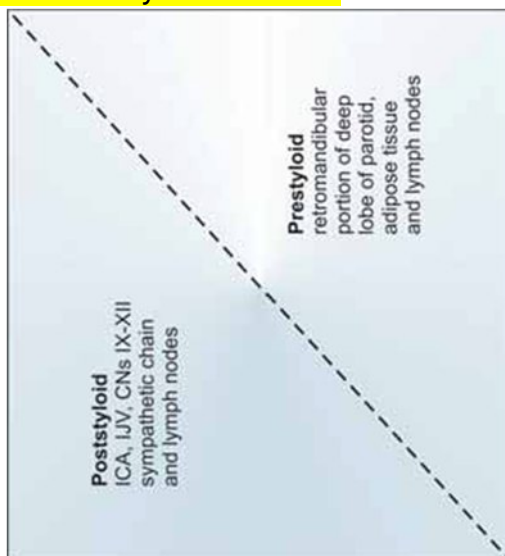
Posterior: anterior layer of carotid sheath

Masses in the parapharyngeal space can be palpable anterior to the upper part of scm

Parapharyngeal space divisions:

The parapharyngeal space is divided by A layer of fascia (bucopharyngeal fascia) that extends from the medial pterygoid plate and tensor palati to the spine of the sphenoid and the styloid process loosely divides into:

a)



The Prestyloid space (muscular):

- o anterolaterally
- o contains: Fat, Lymph Node, Medial & lateral pterygoid muscle, Styloid muscle, Internal maxillary artery, Ascending palatine branch of facial artery, Ascending pharyngeal artery, Mandibular branches (Auriculotemporal, Inferior alveolar, Lingual nerve), Deep lobe of

parotid gland

- o majority of tumors are salivary gland tumors
- a) The poststyloid contains (neurovascular) (carotid space):
 - o Posteromedially
 - o Contains:
 - carotid sheath: carotid arteries, internal jugular vein, cranial nerves IX, X, XI, XII (9-12):
note that VI courses posteriolaterally after leaving the jugular foramen & is not involved to any extent in parapharyngeal space infections
 - cervical sympathetic chain, Deep cervical lymph nodes.
 - o The majority of tumors are either neurogenic or vascular in origin

Parapharyngeal space communicates with:

retropharyngeal space (not free communication: there is condensation of fascia around the carotid sheath, which separates the parapharyngeal & retropharyngeal space)
submandibular space
Peritonsillar space

Note: bilateral spread of the infection is rare in the neck.

The most common causes of parapharyngeal abscess is: Tonsillitis, Dental infection (esp 3rd molar)
Others: salivary gland infection, Middle Ear infections (base of the parapharyngeal space is the petrous bone), Spread of retropharyngeal infections

This space is the most complex and clinically most important space Due to its central location and its relationship to other spaces in the neck:

pharyngeal mucosal space : medial
masticator space: anterolateral
parotid space: lateral
carotid space: posterior
retropharyngeal space: posteromedial

The parapharyngeal space contains a fat pad, which is located **centrally**.

The radiological displacement pattern of this fat pad is useful for diagnosing lesions in this area. Prestyloid and lateral lesions will displace the fat posteromedially, while poststyloid lesions will displace this fat anteriorly

Parotid space masses: push the fat **medially**

Masseter space masses: **posterior**

Manifestation of parapharyngeal space infections:

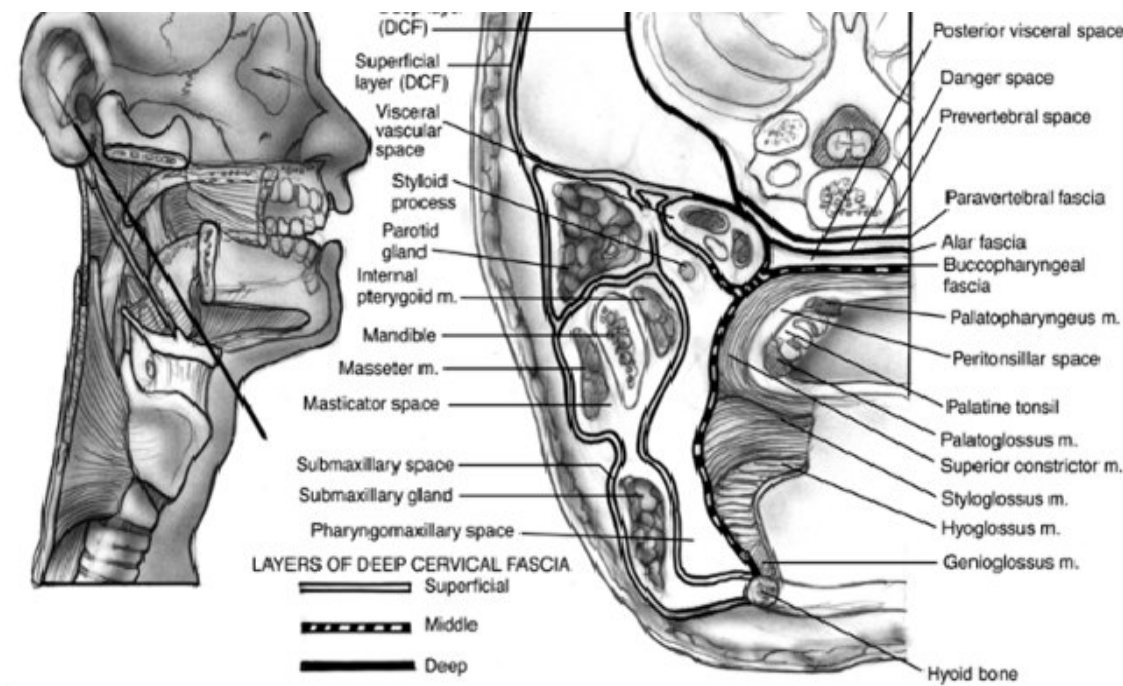
Retromandibular fullness, Medial displacement of the lateral pharyngeal wall, Parotid edema
Dysphagia, Trismus: due to irritation of the mastication muscles

Complication of parapharyngeal infection:

Internal jugular thrombosis, Carotid artery erosion, Mediastinitis

Cranial nerve paresis:

- o Horner syndrome: sympathetic chain
- o Horseshoe of voice: vagus
- o Tongue paresis: XII



relation ship of parapharyngeal space to other spaces

Spaces extending the whole length of the neck

These spaces communicates with mediastinum

Retropharyngeal space

This sits between the 2 parapharyngeal spaces and is **continuous** with both (but not freely)

Borders:

Superior boundary: the skull base

Anterior boundary: the musculature of the pharynx (buccopharyngeal Fascia)

posterior limit: alar division of prevertebral fascia

Inferior limit: It continues inferiorly behind the oesophagus and eventually communicates with the posterior mediastinum.

Contents: retropharyngeal lymph nodes of rouvier + loose alveolar tissue

retropharyngeal abscess: points to Posterior pharyngeal wall **OR** Posterior triangle of the Neck

May predispose to pus aspiration/mediastinitis

acute vs chronic abscess:

	acute retropharyngeal abscess	Chronic retropharyngeal abscess
Age group	Infants	Adult
Cause	results from suppuration in the retropharyngeal lymph node following URTI	due to T.B cervical vertebra may be involved
Approach of drainage	drained through the mouth	external approach through the neck

Danger space:

Between the alar division and the pre-vertebral division of the Prevertebral fascia

Lies between **retropharyngeal & prevertebral**

Extends from skull base to the **diaphragm**

Prevertebral

This is the potential space that lies between the cervical vertebrae and anterior longitudinal ligament posteriorly and the prevertebral fascia anteriorly.

It extends down to the third thoracic (T3) vertebra where the fascia is bound to the vertebra.

The prevertebral fascia is thin and infections in this space can rupture directly through into the posterior mediastinum.

Spaces limited below the hyoid

Pretracheal space/anterior visceral space

Located:

anterior and lateral to the thyroid cartilage

deep to the strap muscles

It contains the delphian node

It communicates with the superior mediastinum.

Muscles of the neck

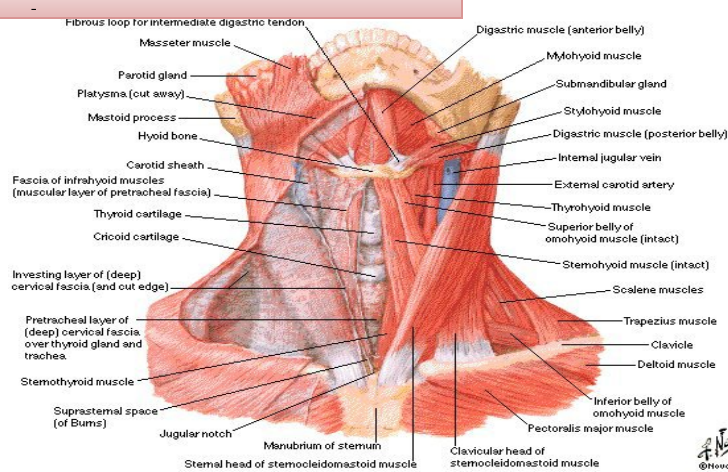
Group I : Superficial neck muscle : platysma

Group II: Lateral Neck muscle: sternocleidomastoid, trapezius muscle

Group III : Suprahyoid muscle: Superficial layer : Digastrics, Stylohyoid; **Intermediate layer :** Mylohyoid; **deep layer:** Geniohyoid muscle

Group IV: Infrahyoid muscle: Sternohyoid, Omohyoid, Sternothyroid, Thyrohyoid

Anteriolateral muscles of the neck



Group 1: superficial muscles of the Neck:

Platysma:

Origin: Superficial **fascia** over the **upper** part of the pectoralis fascia and the deltoid muscle

Course: Fibers cross the **clavicle**, and proceed obliquely upward and medially along the side of the neck.

Insertion:

Anterior fibers: Interlace, below and behind the **symphysis menti**, with the fibers of the muscle of the opposite side

Posterior fibers: cross the **mandible**, Some being inserted into the bone below the oblique line, Others into the **skin** and **subcutaneous** tissue of the lower part of the face. Many of these fibers blend with the muscles about the angle and lower part of the mouth

Relationship: Beneath it, the **external jugular vein** descends from the angle of the mandible to the clavicle.

Innervation: Cervical branch of Facial nerve

Blood supply: Submental branch of the facial artery

Action:

Draws the corners of the **mouth inferiorly** & widens it (as in expressions of sadness & fright).

Expression of surprise (pull the corner of the mouth downward & laterally partially opening the mouth)

With maximum contraction pulls the skin over the clavicle upward causing wrinkles

draws the **skin** of the neck superiorly when u clench the teeth

Increase neck diameter (In forced rapid respiration)

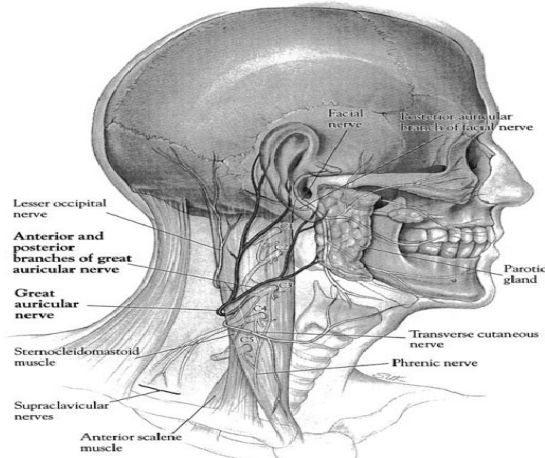
Group II: Lateral muscles of the Neck

1- Sternocleidomastoid Muscle:

Origin:

Sternal head: thick **tendon**, which inserts into the anterior & lateral surface of the manubrium

Clavicular head: **muscular** and inserts into the medial 1/3 of the clavicle.



Insertion: clavicular head mainly to Lateral aspect of the mastoid tip & sternal head mainly to the lateral 1/2 of the superior nuchal line.

Action: The muscle combines a cruciate and spiralized arrangement of fibres, This gives a complex action which:

Tilts the head to the shoulder on the same side

Rotates the head to the opposite side

assist longus coli in neck flexion

Nerve Supply:

Motor: Spinal accessory motor C2-3

Sensory & proprioceptive Nerve Supply: Anterior/ventral Rami of C2-4 segments

Fibrositis of the upper part of the SCM cause referred otalgia

Blood supply:

Comes from the superior and inferior ends of the muscle with anastomoses in the middle of the muscle.

The **superior** pedicle: branches of the **occipital** artery

The **inferior** pedicle: Branches of the **superior** thyroid vessels

Relation to other structures: External jugular vein & Cutaneous nerves lies deep to the platysma and superficial to SCM

1- Trapezius

Origin: medial 1/3 of the superior nuchal line, ligamentum nuchae down to the seventh cervical vertebra, and all the spinous processes and interspinous ligaments down to the 12th thoracic vertebra.

Insertion:

o Superior fibers: insert into the clavicle and acromium

o Inferior fibers (from the thoracic vertebrae): insert into the spine of the scapula.

Action:

Rotate the scapula so that the glenoid fossa points up.

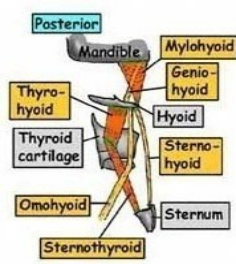
The trapezius is the major antigravity muscle of the shoulder girdle

Nerve supply:

Motor: spinal part of the accessory nerve from roots C1-6, Cervical plexus (some fibers)

Proprioceptive: the cervical plexus.

Paralysis: a common consequence of surgical damage to the accessory nerve in the posterior triangle due to malrotation of the scapula and traction on the brachial plexus, which leads to severe chronic neck pain.



Innervation: Facial Nerve

Intermediate layer

- 1- **Mylohyoid Muscle:** A flat triangular muscle that with its opposite form the floor of the mouth

Origin: Oblique line of the mandible from the mandibular Symphysis to the last molar

Insertion:

Anterior + middle fibers: median raphe

Posterior Fibers: body of the hyoid

Action:

Elevates the floor of the mouth

Elevates the hyoid and assist in elevating the tongue upward or protrude the tongue

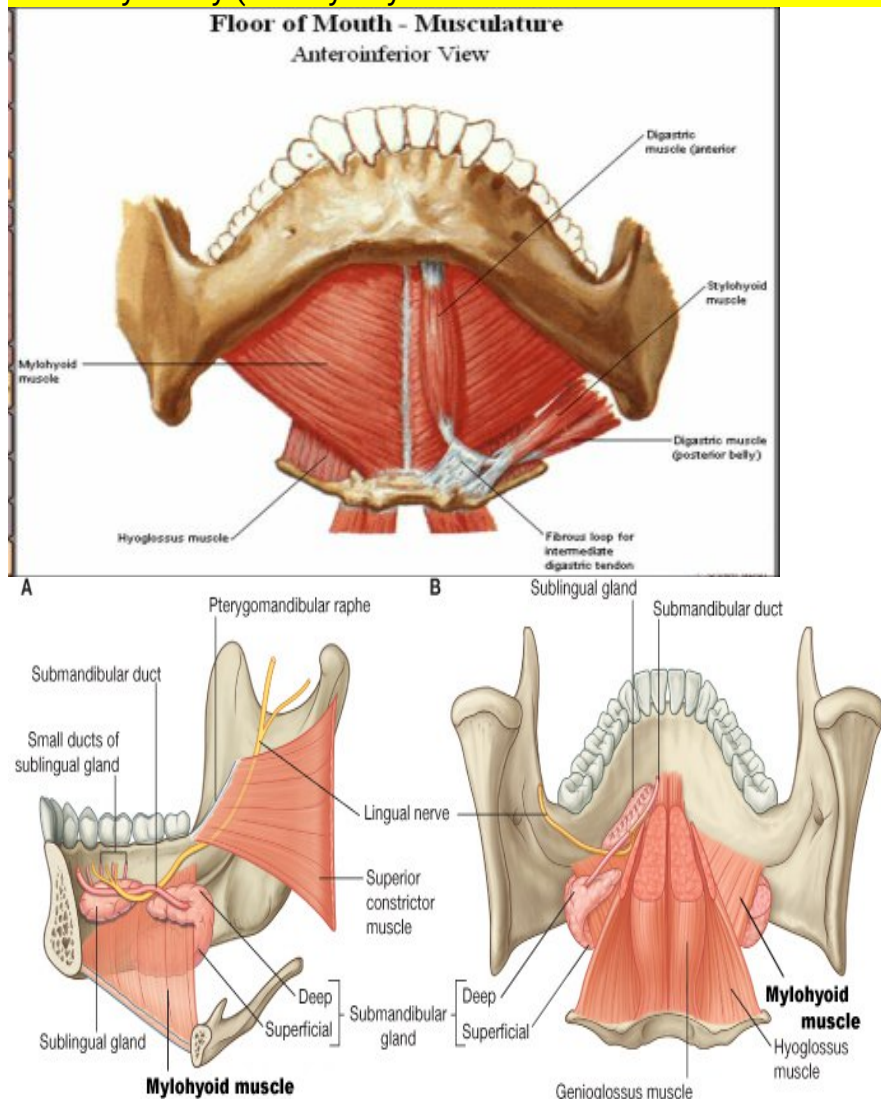
Lower the mandible and assists in opening the mouth; Acts in swallowing, sucking, mastication, blowing

Innervation: Trigeminal nerve: mandibular division: inferior alveolar branch: Mylohyoid branch

Blood supply:

lingual artery (sublingual branch)

maxillary artery (the mylohyoid branch of the inferior alveolar artery)



1- **Geniohyoid muscle:** Narrow muscle that is located deep to the medial aspect of the Mylohyoid

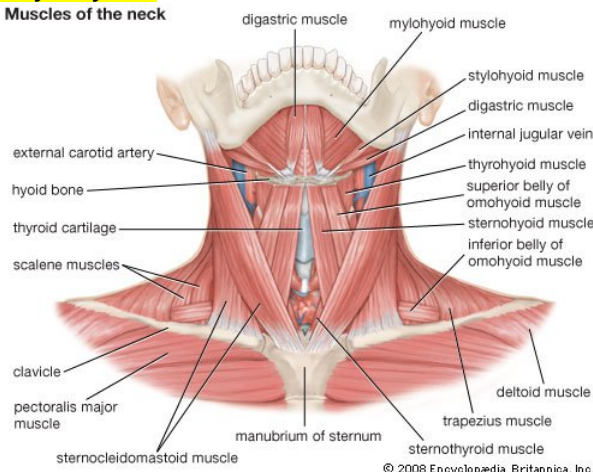
muscle

- o **Origin: Inferior mental spine** in the inner surface of the mandibular symphysis
- o **Course: Inferioposterior**
- o **Insertion: The Contralateral Mylohyoid muscle; Body of the hyoid bone**
- o **Action:**
pulls & elevates the hyoid causing shortening of the floor of the mouth during swallowing
Retracts and depresses the mandible when the hyoid bone is fixed by the infrahyoid muscle
- o **Innervation: C1 root of the hypoglossal nerve**

Group IV: Infrahyoid muscles: strap muscles:

Made of 4 muscles that cover thyroid, larynx & trachea: Sternohyoid, Omohyoid, Sternothyroid, Thyrohyoid

Muscles of the neck



Forms the floor of the muscular triangle

The **lower** part is covered by the sternocleidomastoid

The strap muscles are retracted to reach the thyroid and the trachea

Form the anterior boundaries of neck level

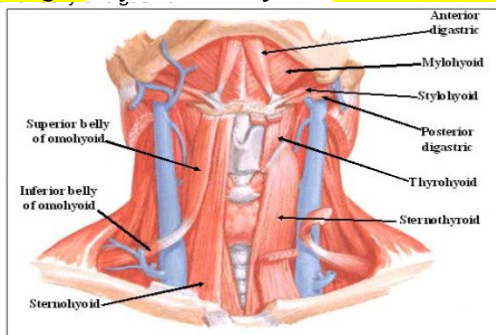
Action:

Move the larynx; Depress the mandible

Innervation: from **C1, C2 & C3** via **ans Cervicalis**

Omohyoid:

Origin: hyoid bone just lateral to the attachment of sternohyoid



Course: it courses inferiorly. it diverges laterally. runs deep to the sternomastoid and crosses the internal jugular vein at which point it becomes a tendon.

It is a useful landmark for the internal jugular vein.

Lateral to the internal jugular vein the inferior muscle belly develops, runs across the posterior triangle

Insertion: Suprascapular ligament and the lateral acromium.

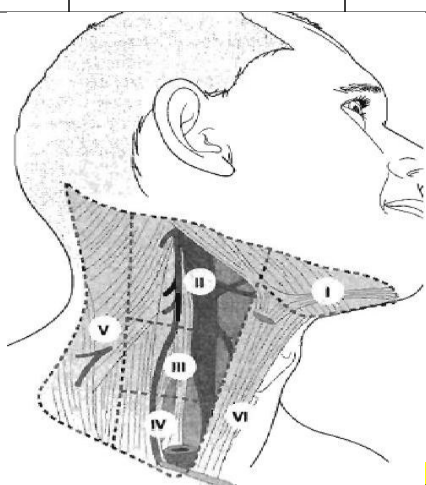
Nerve supply: ansa cervicalis

Embryologically: Its distal insertion is to the medial clavicle and it migrates laterally to the adult position

Function: is obscure.

Level	Triangle/neck area	Subzones	Drained structures

Level 1	Submental	Zone 1a	anterior floor of mouth, lower lip, ventral tongue
	Submandibular	Zone 1b	Rest of the oral cavity
Level 2	Upper jugular L.N	Zone IIa	Parotid, oropharynx, hypopharynx, larynx
		Zone IIb(submasscular recess)	
Level 3	Middle jugular		Pharynx, larynx
Level 4	Lower jugular		Hypopharynx, larynx
Level 5	Posterior triangular	Zone Va = occipital	nasopharynx
		Zone Vb= supraclavicular	Thyroid gland
Level 6	Central /anterior		Paratracheal, pertracheal, peri thyroidal Delphian (precricoid)



Jugular Lymph node/deep cervical

80% of lymph nodes in the neck are closely associated with the internal jugular vein.

Upper Jugular / deep cervical

The most superior segment of the vein extends from the skull base to the level of the carotid bifurcation which coincides with the level at which the greater cornu of the hyoid bone crosses the internal jugular vein.

At the most superior extent of the vein, it runs deep to the digastrics muscle.

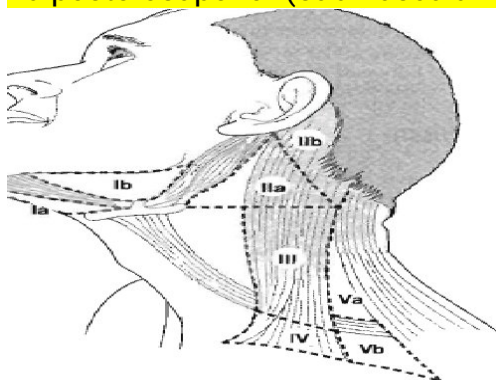
Nodes found here are referred to as the jugulodigastric nodes.

They drain the palatine tonsil

LEVEL II: The course of the spinal accessory nerve divides this level into two subzones:

Level IIa lies anteroinferior to the spinal accessory nerve

IIb posterosuperior (submuscular recess).



It is a clinically useful anatomical differentiation because positive level IIa disease mandates IIb dissection

However elective dissection for laryngeal and hypopharyngeal malignancy can exclude level IIb.

Middle jugular/ deep cervical nodes

Found between the carotid bifurcation and the level at which the omohyoid tendon crosses the internal jugular vein.

Lower jugular/ deep cervical nodes:

are those between the tendon of omohyoid and down to the thoracic inlet. They are sometimes referred to as the prescalene group of nodes.

They form an important confluence between the mediastinal node group, the axillary group and the neck.

This communication can be a reason why neck nodes may appear secondary to disease outside the neck.

Note: the middle & lower jugular L.N lies below the level of hyoid bone and drain the hypopharynx

LEVEL V sub zones:

Va:

- o lies superior to the inferior belly of the omohyoid muscle
- o contains the chain of nodes along the accessory nerve, which drain the nasopharynx

Vb:

- o inferior to the omohyoid muscle.
- o contains nodes related to the thyrocervical trunk which drains the thyroid gland.

Note:

Nasopharynx: drain into retropharyngeal & upper deep cervical

All areas of the pharynx will drain ultimately into the lower deep cervical

Base of the tongue has rich bilateral drainage, hence the high incidence of neck metastases of tongue base CA

Tonsils drain into jugulodigastric lymph node

Pyriiform fossa drain into para+pre tracheal L.N