# The neck
# Triangles of the neck & cranial nerve XI.

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# objects

- 1-Define the boundaries of the neck.
- 2-Describe the fasciae of the neck.
- 3-Summarize the main arteries, veins nerves and lymph nodes of the neck.
- 4-Note it is essential to go to the dissecting room and have a look at the various components. An extensive lab will be prepared for this purpose.
- 5-Review the boundaries of the neck.
- 6-Describe the key muscles creating the triangles, mainly, sternomastoid, omohyoid and digastric.
- 7-Study each triangle in the following way :a/Boundaries/Contents of muscles, arteries, veins, nerves, organs and glands.
- 8-Follow up the course of the accessory nerve from the point of its central connections, exit and down to its target organs.
- 9-Make a list of types of nerve fibers making the nerve.

A one year old boy had a history of birth trauma to the soft tissues of the neck. On examination, the boy's head was tilted to the right side, while the face was turned to the left side and upwards.

**What is the problem with his neck??**

**What are the structures in our neck?????**

**Fascia……muscles…….**

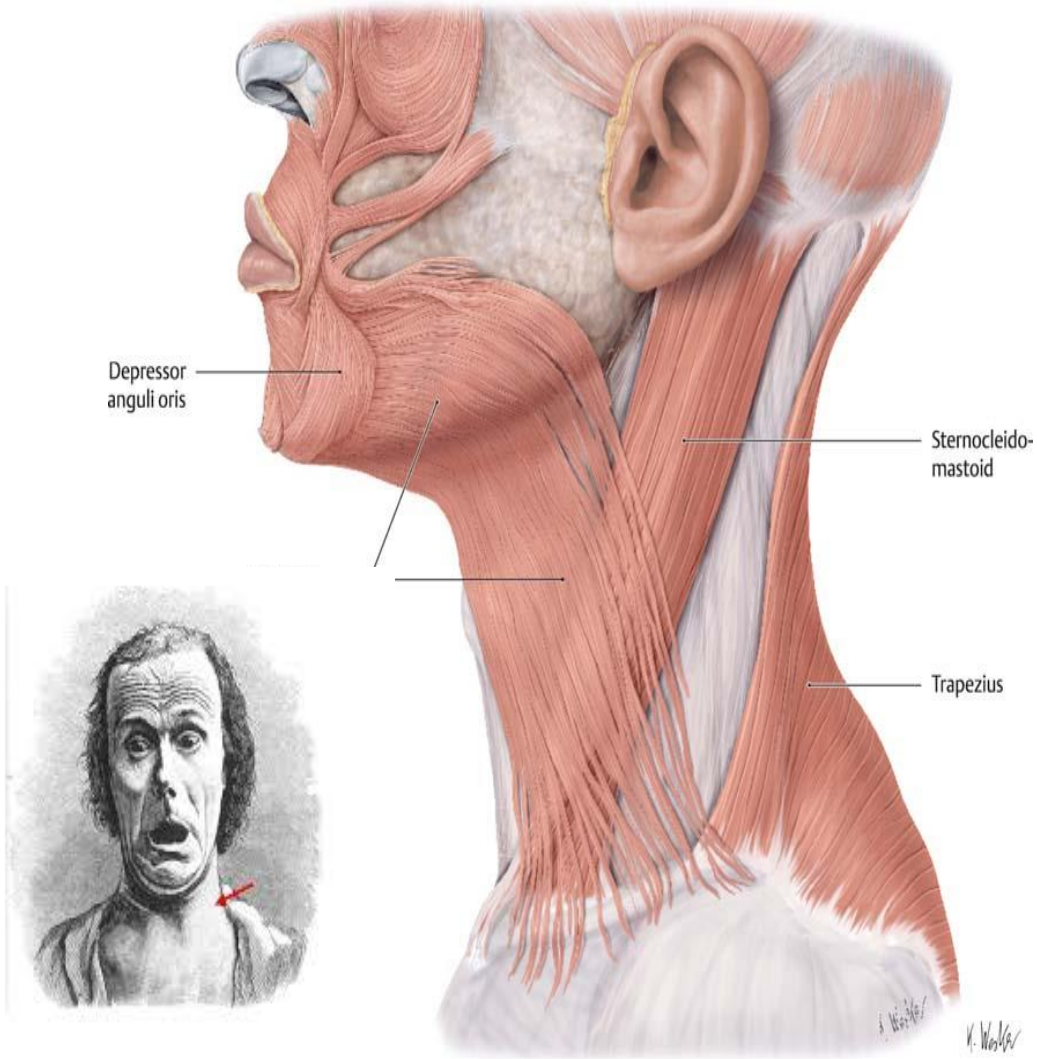
# Fascia of the neck (superficial & deep)

## I-Superficial fascia

### *Contents*

### *1-Platysma*

- ***subcutanous muscle***
- ***It is supplied by the facial nerve (cervical branch)***
- ***It is one of the muscles of facial expression (depresses mandible & angle of the mouth)***



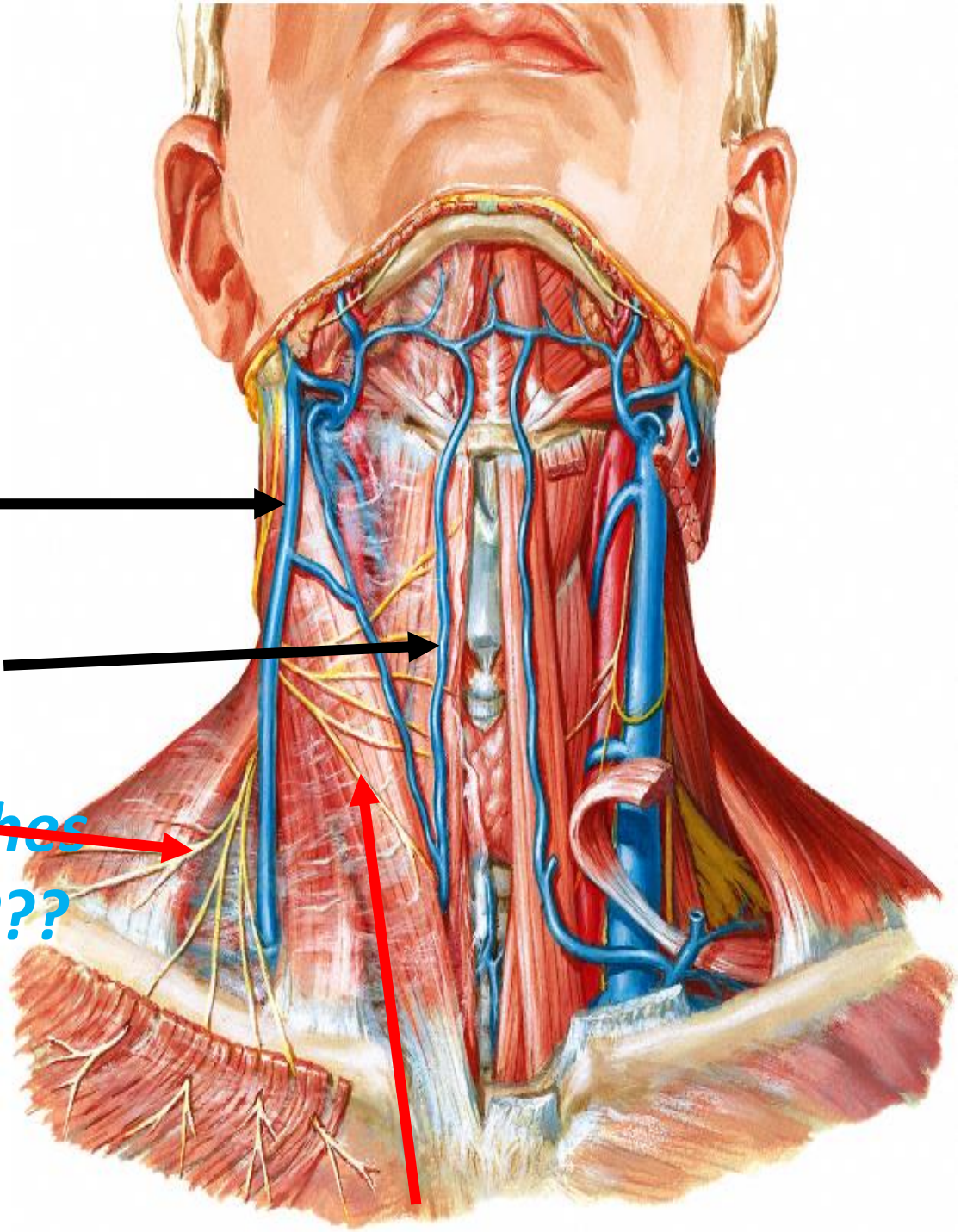
# I-Superficial fascia

## *Contents*

### *2- Superficial veins*

- *External jugular veins*
- *Anterior jugular veins*

### *3- Cutaneous branches of cervical plexus ????*



# Fascia of

## II-Deep fascia

*It is condensed to fo*

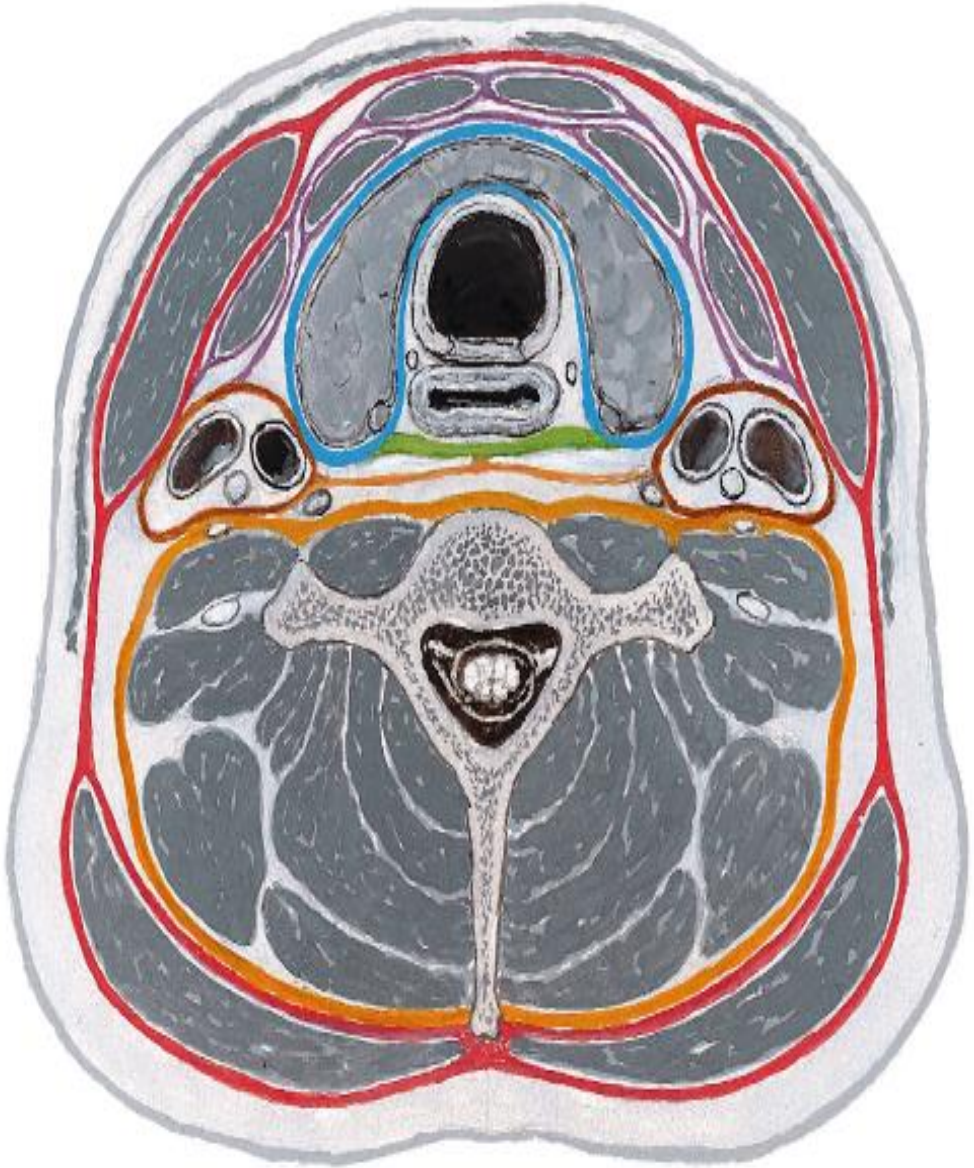
*following four layers*

1- Investing layer.

2- Pretracheal layer.

3- Prevertebral layer

4- Carotid sheath.



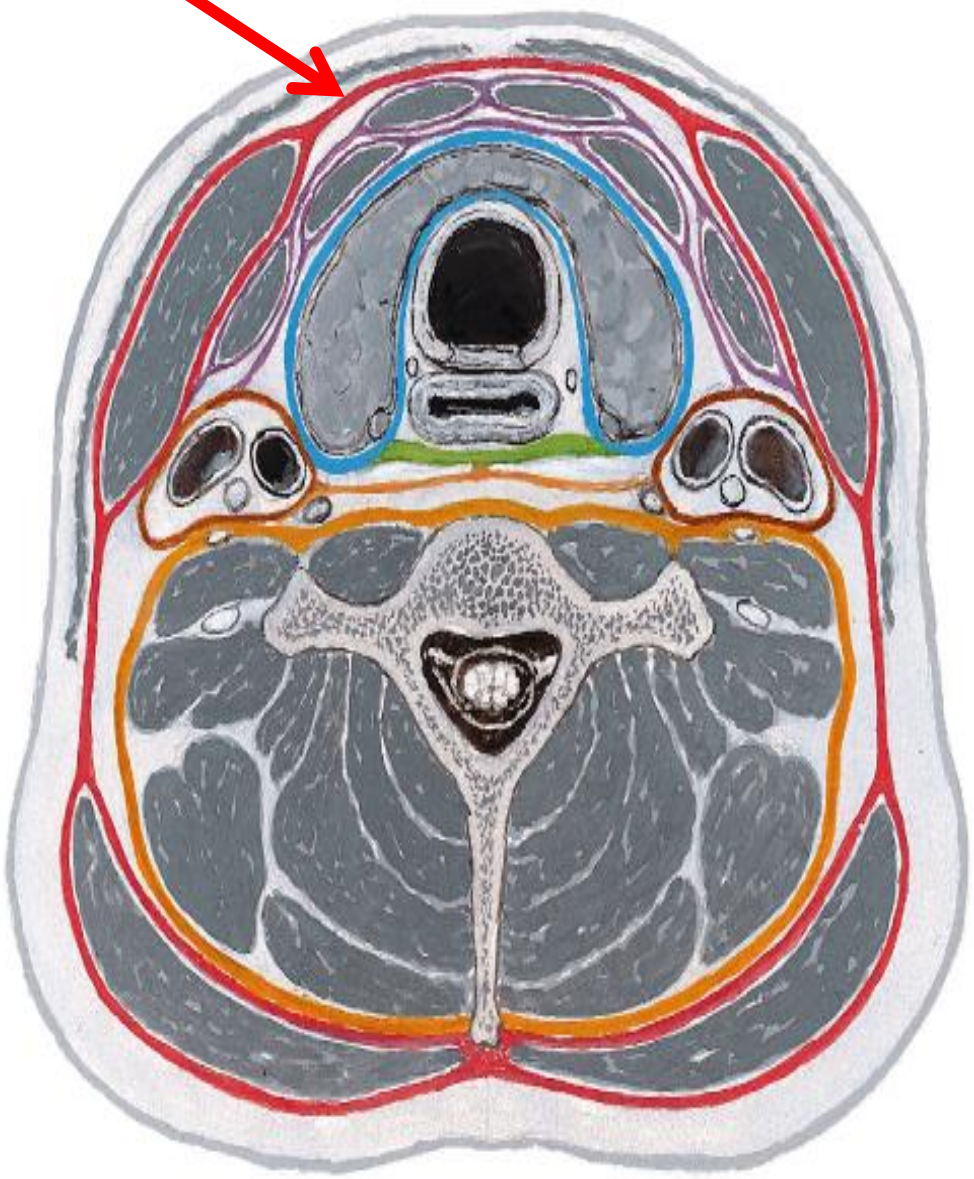
# 1- Investing layer.

- **It surrounds the neck like a**

**Collar.**

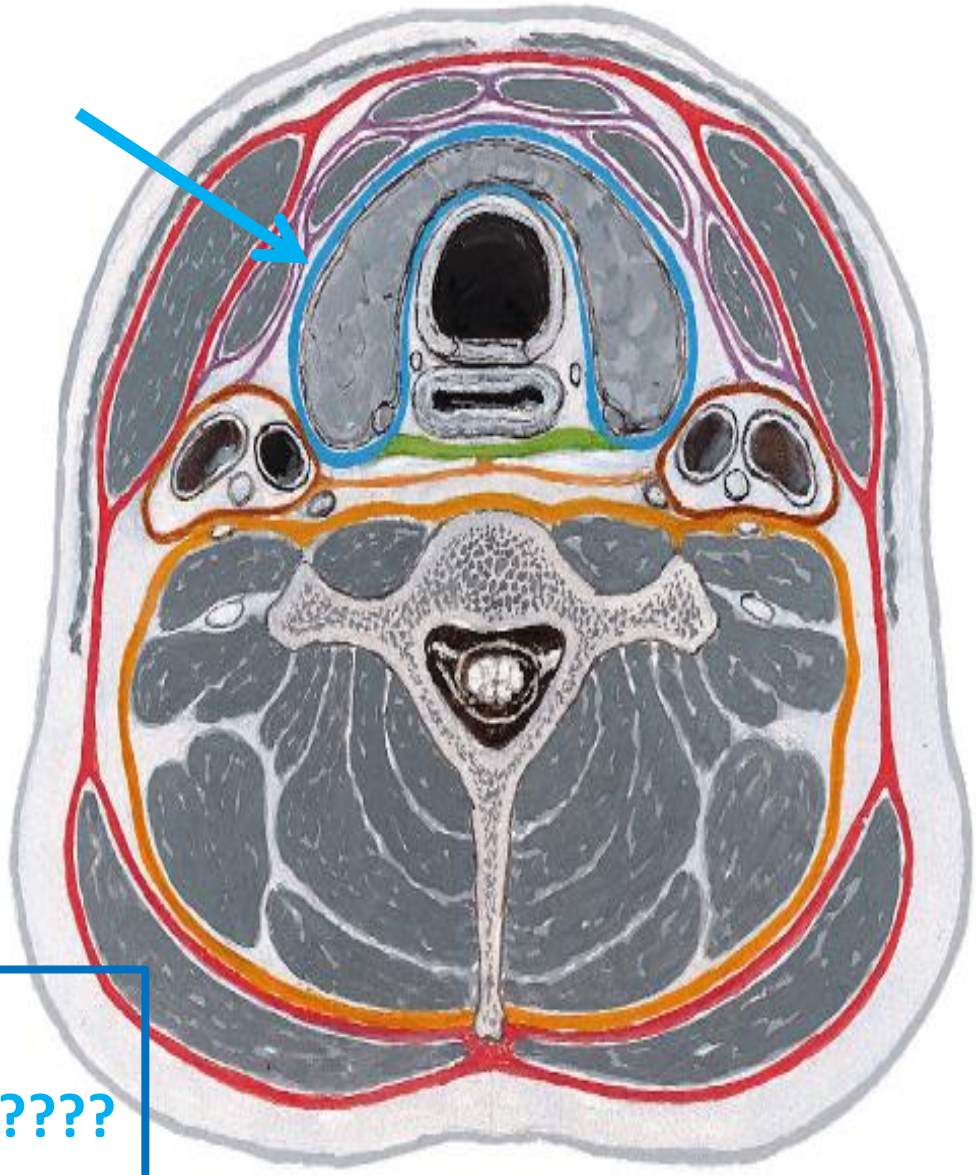
- **Invest the sternomastoid muscles and trapezius.**

**Invest the parotid and submandibular gland, its thickening forms *stylomandibular* ligament between the two glands**



# 2- Pretracheal fascia

- It lies anterior to the trachea & attached to the thyroid cartilage.
- Encloses viscera of neck: pharynx, larynx, trachea, esophagus.
- It invest thyroid gland and parathyroid glands.



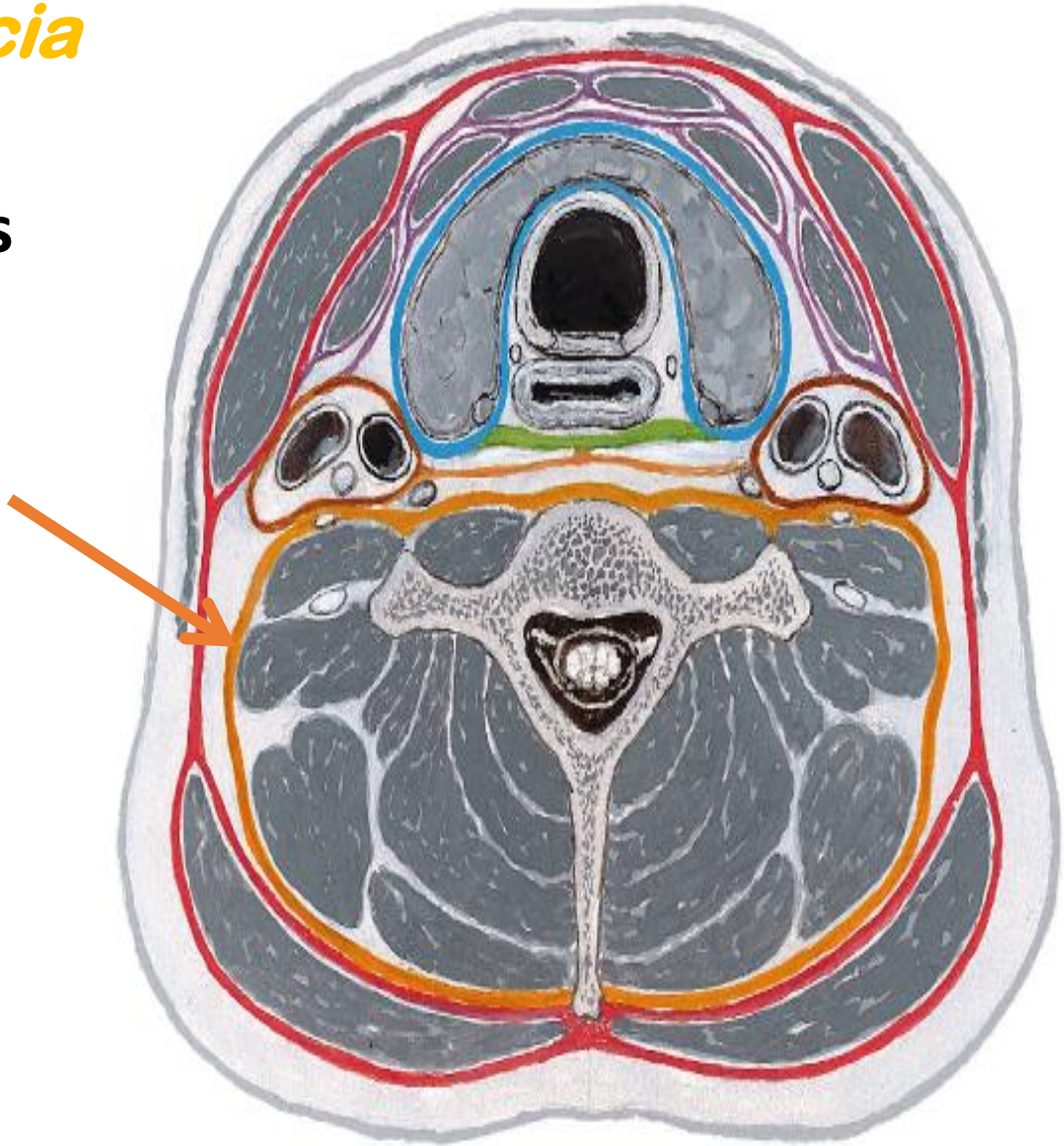
Thyroid gland & its swelling moves with deglutition…Why??????

# 4-Prevertebral fascia

- **Lies anterior to bodies of cervical vertebrae and prevertebral muscles.**

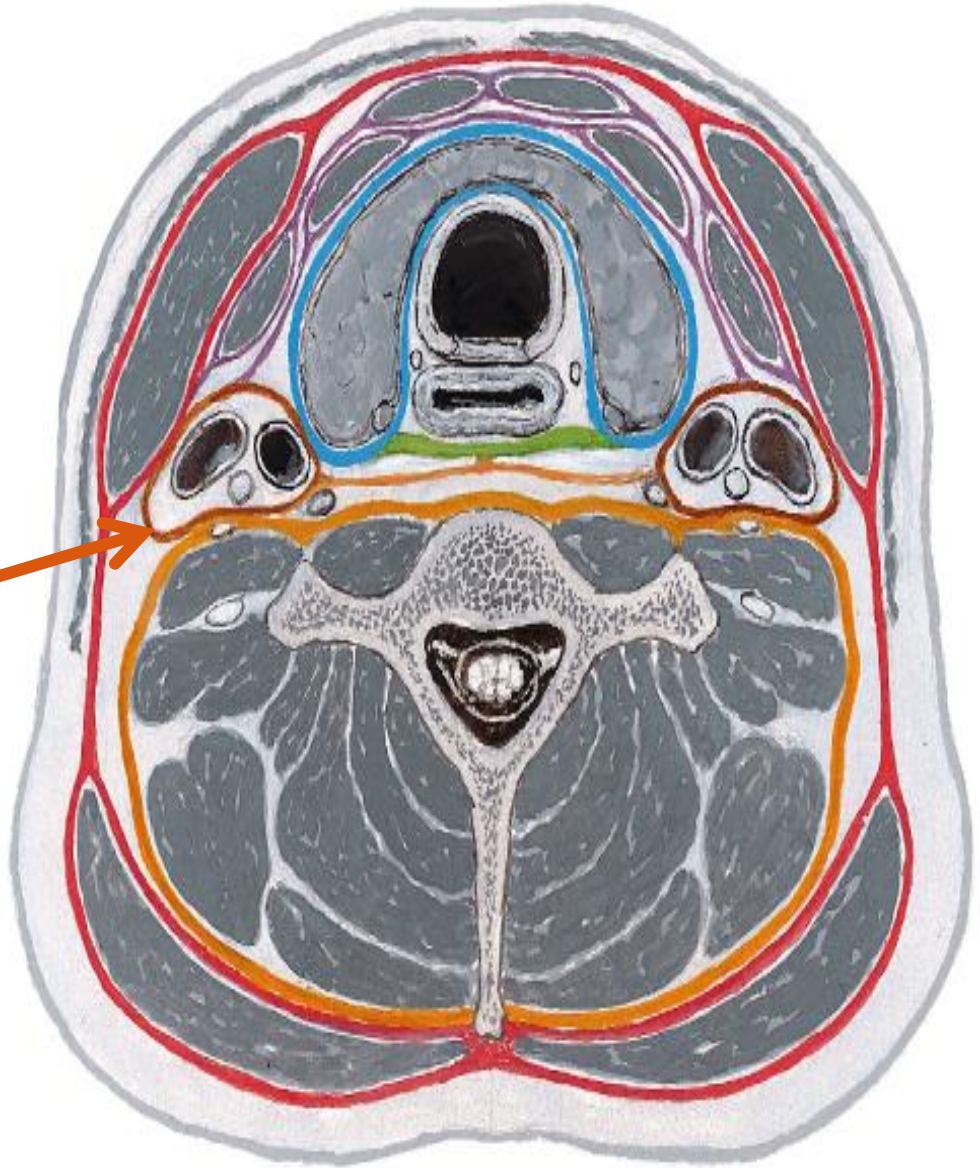
- **Forms the floor of posterior**

**triangle.**



# 4- Carotid sheath

- It is a condensation of fibro-areolar tissue, surrounds common & internal carotid arteries, internal jugular vein & vagus nerve.



- Ansa cervicalis ??????

is embedded in its anterior wall.

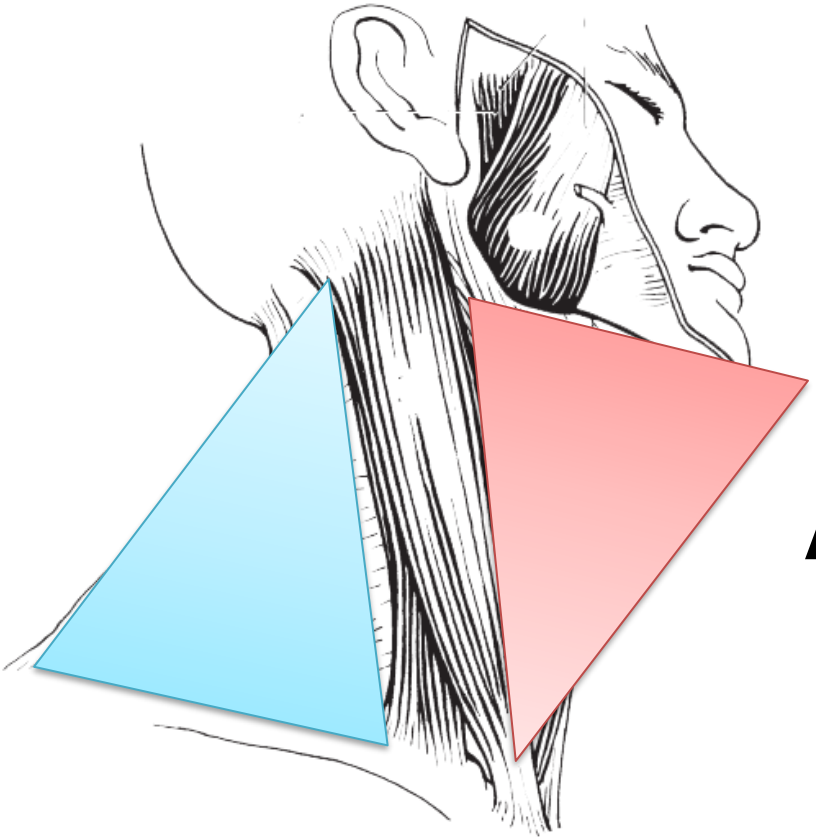
- Sympathetic chain ??????

lies behind the sheath.

# Triangles of the neck

**The Neck is divided by sternomastoid muscle into two Triangles**

**Posterior triangle**



**Anterior triangle**

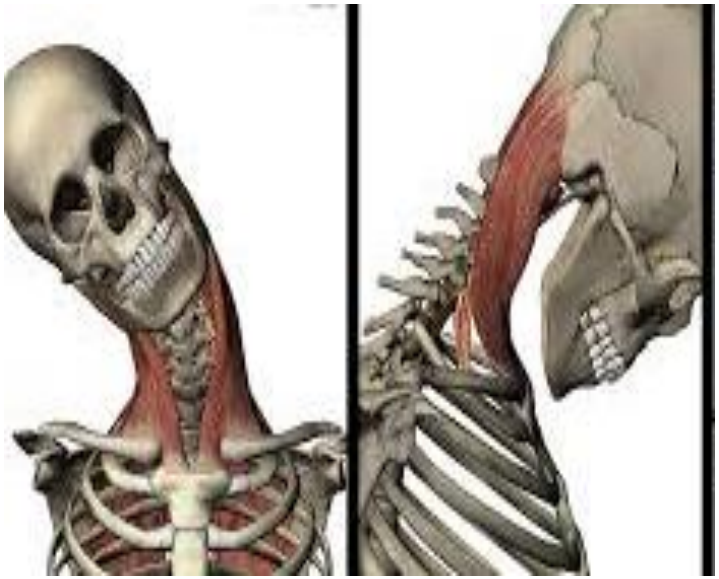
# Sternomastoid muscle:

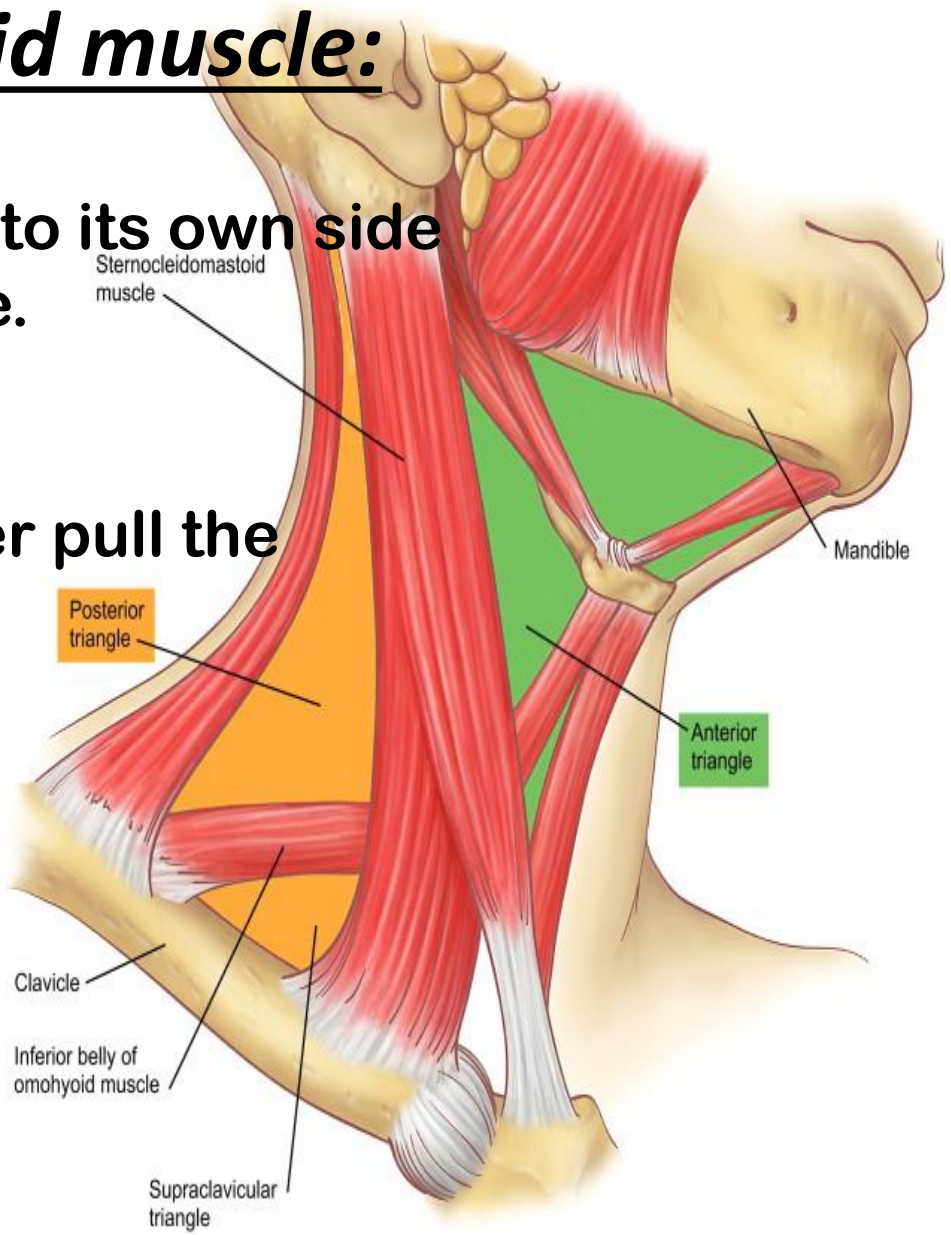
- **Actions :**

**One muscle** bends the head to its own side & turns face to opposite side.

**Lesion????????**

**Both muscles** acting together pull the head
forwards & flex the neck.

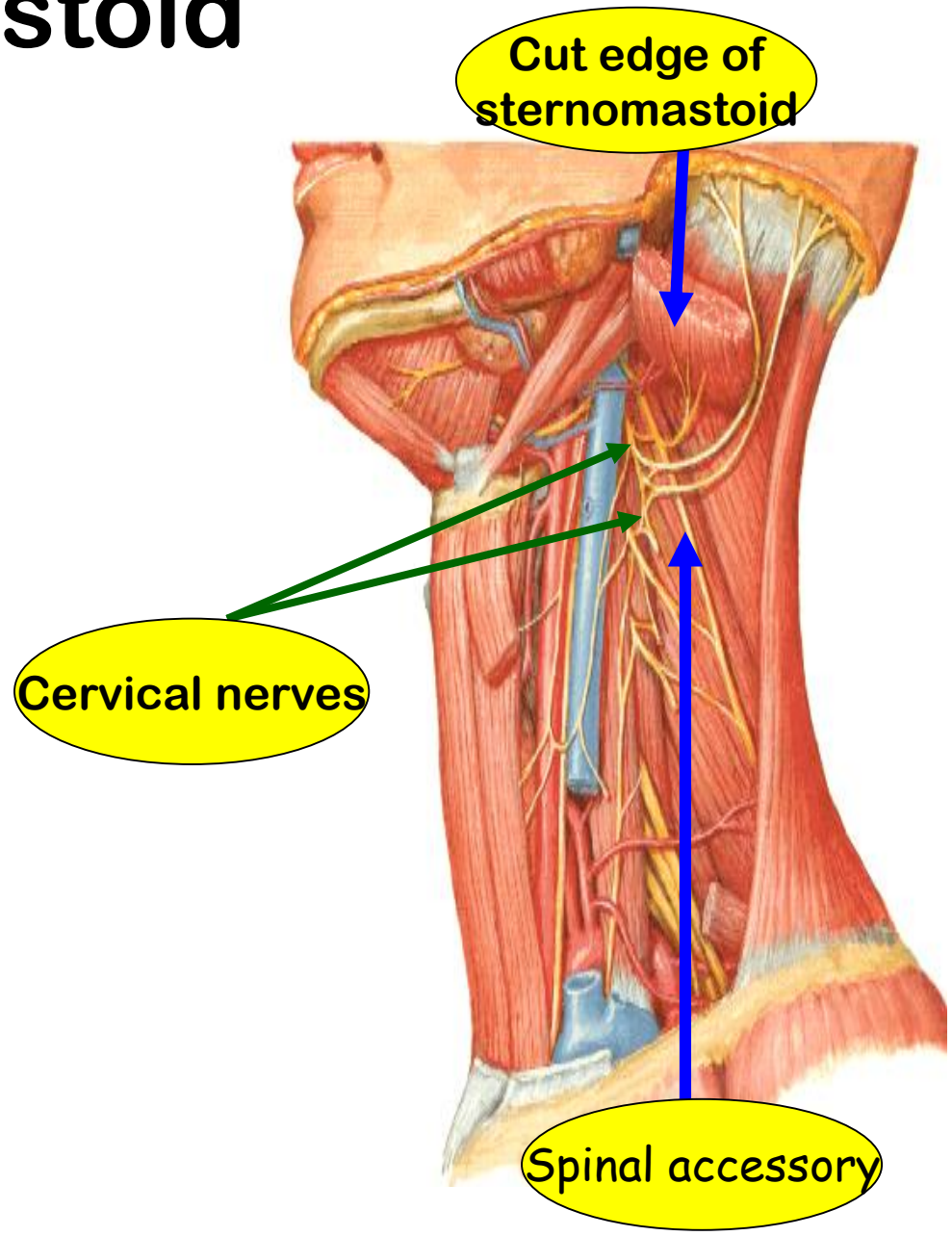




# Sternocleidomastoid muscle

- **Nerve supply**

1. **Motor → Spinal accessory**
2. **Proprioceptive → C2,3**



# Torticollis of sternomastoid

- congenital as a result of excessive stretching of sternomastoid during a difficult labour.
- Spasmodic due to repeated inflammations (myositis).

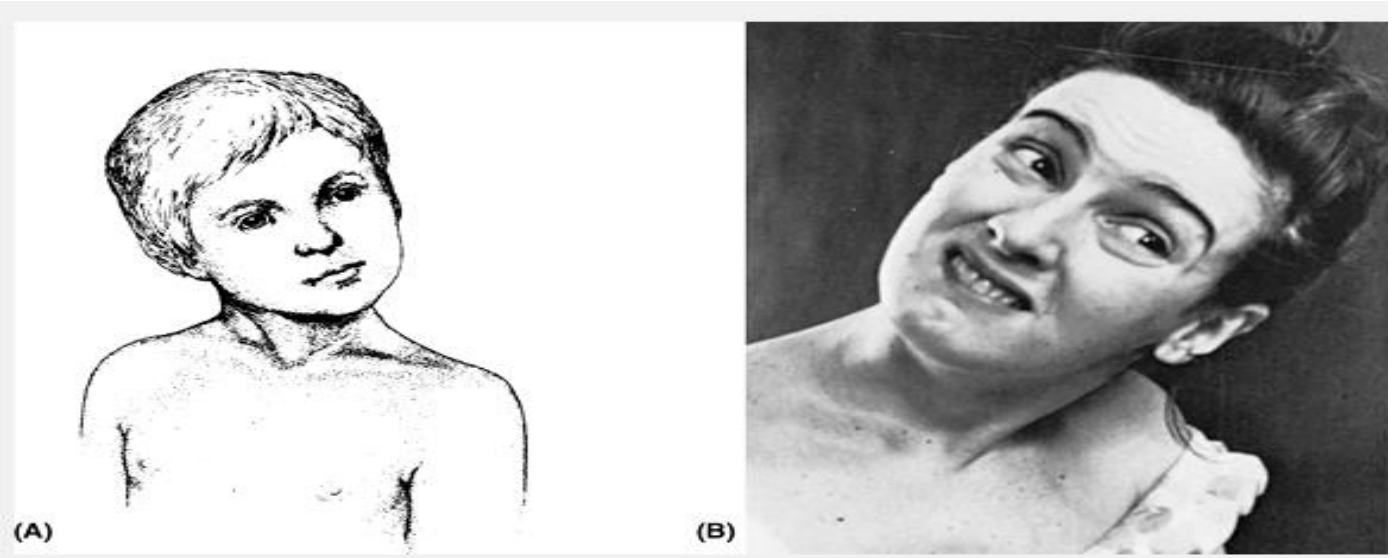
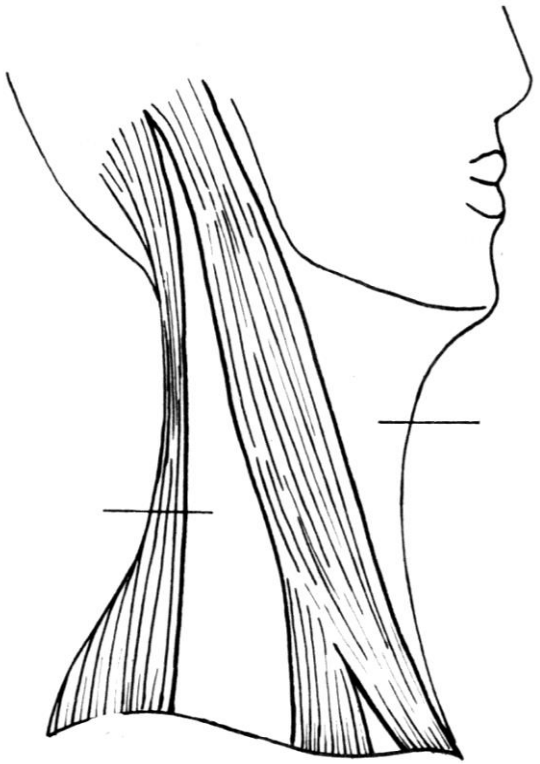


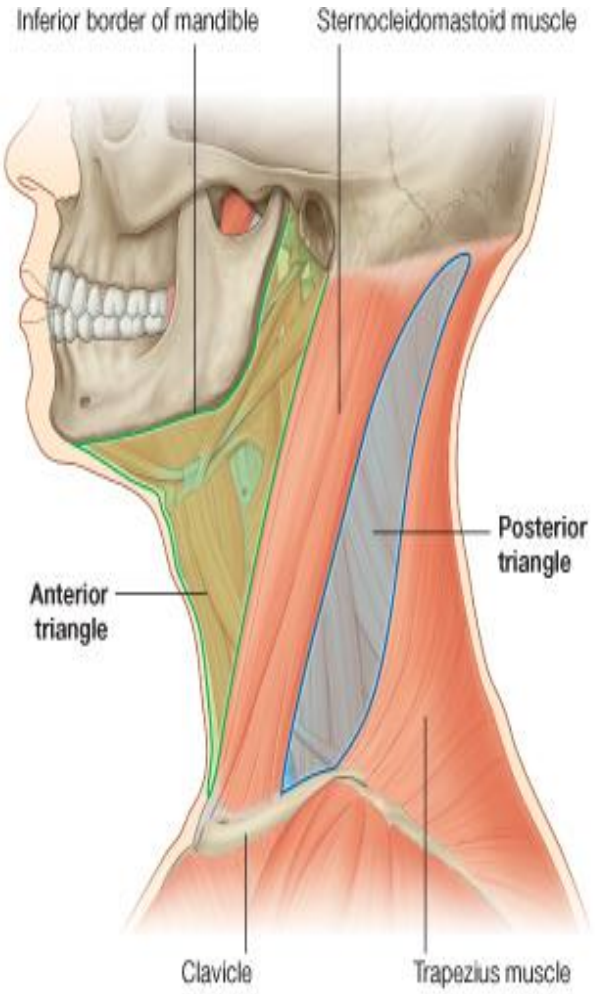

Figure B8.1. Muscular (A) and spasmodic (B) torticollis.

# POSTERIOR TRIANGLE OF THE NECK



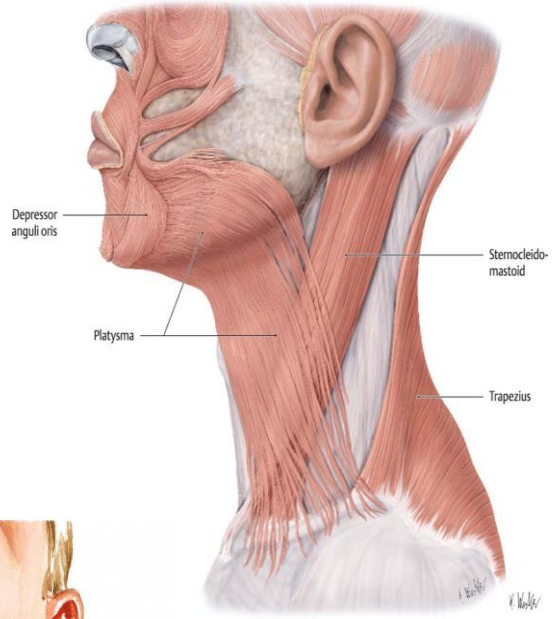
# Boundaries of the posterior triangle:

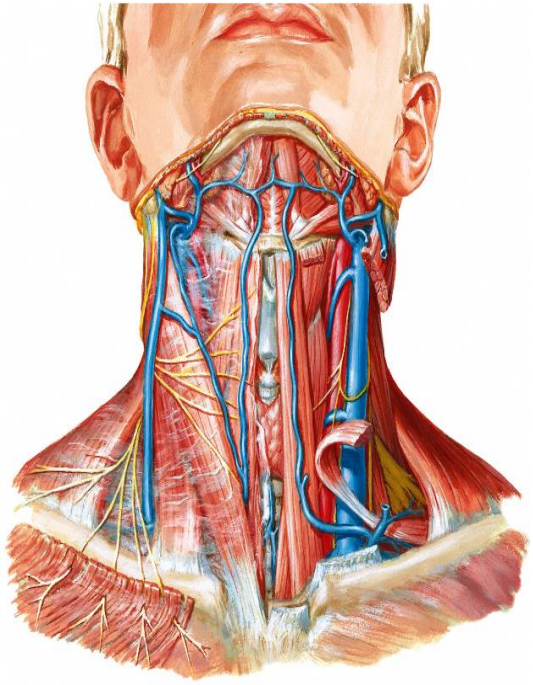
- **Anterior:** posterior border of sternomastoid
- **Posterior :** anterior border of trapezius
- **Base :** clavicle
- **Apex :** meeting of sternomastoid & trapezius.



# Roof of the posterior triangle:

- Skin
- superficial fascia containing ??????
- **The investing layer of deep fascia of neck**

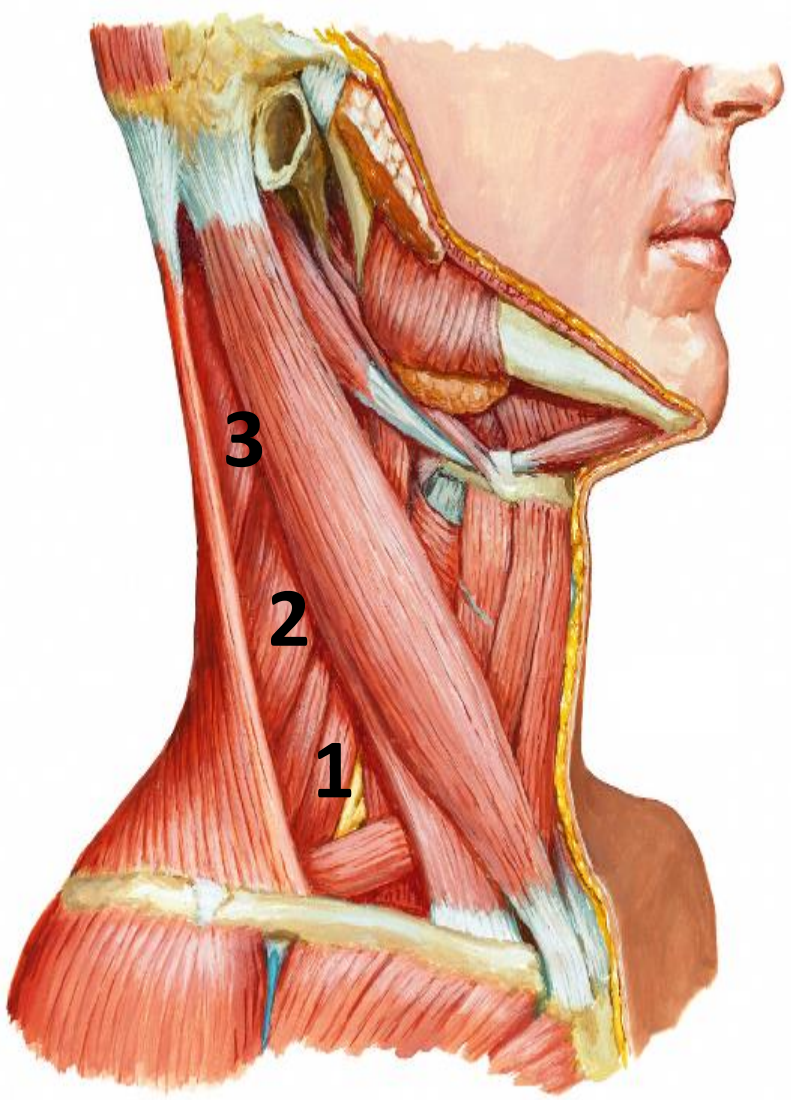


# Floor of the posterior triangle:

## Muscular floor
## 3 muscles

1. Scalenus medius
2. Levator scapulae
3. Splenius capitis




**All muscles are covered by prevertebral fascia**

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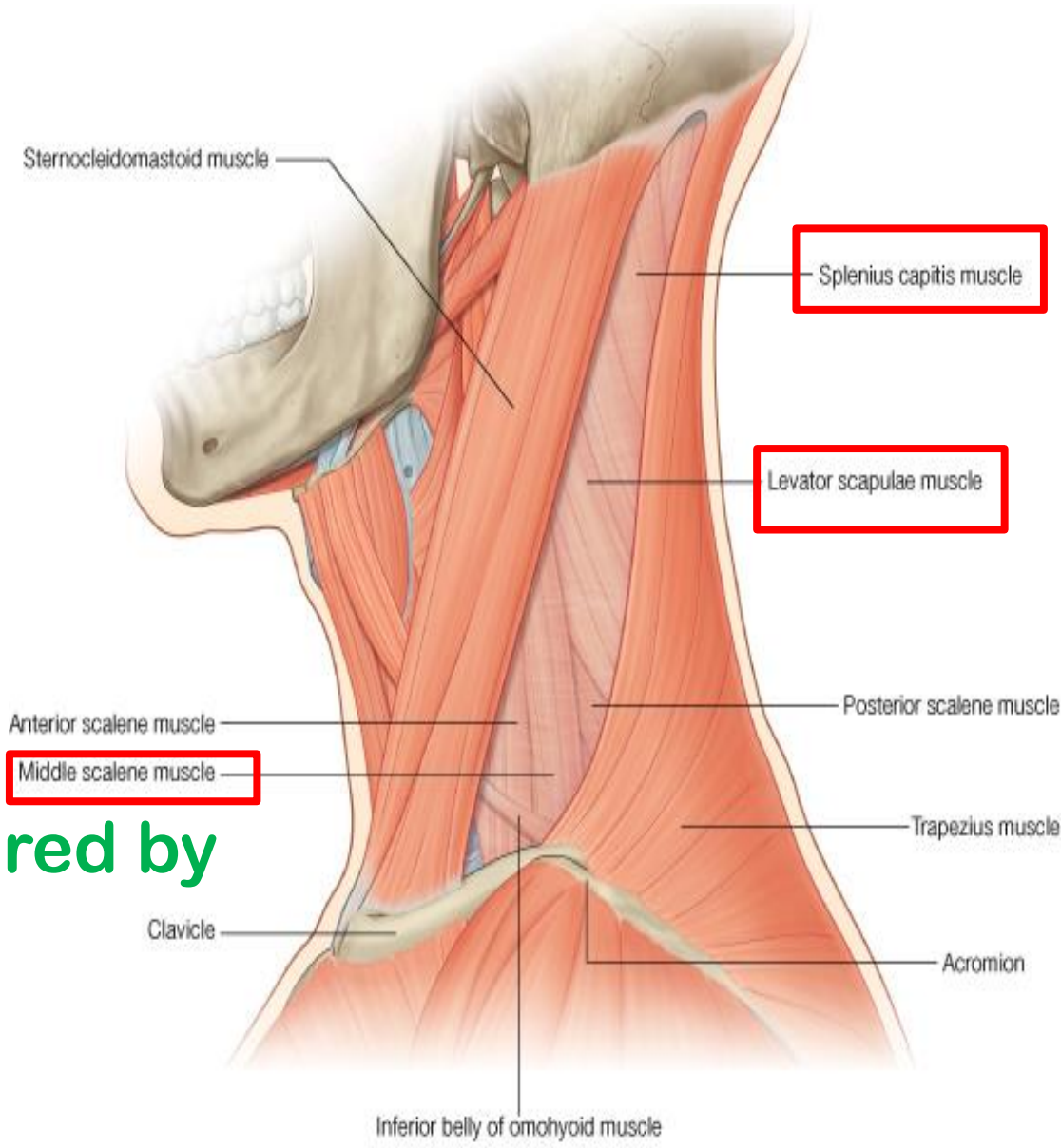


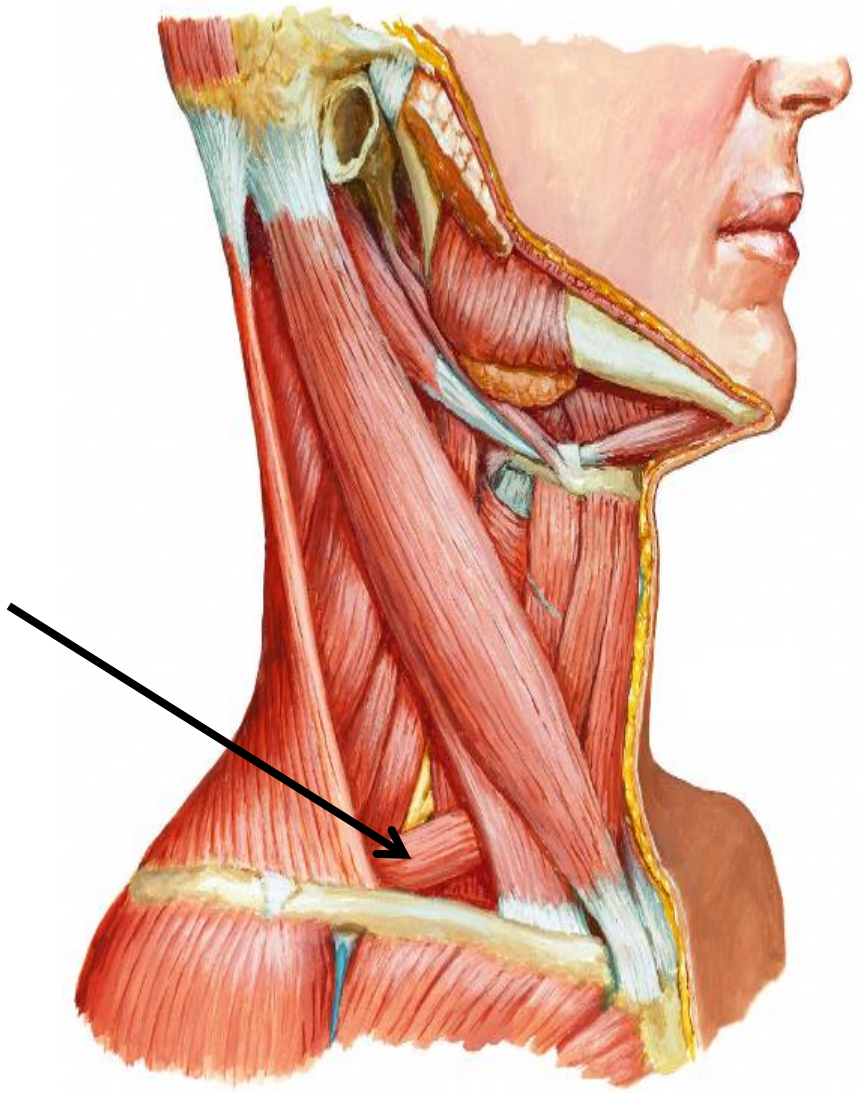

**All muscles are covered by prevertebral fascia**

# Contents of the posterior triangle:

- *1- muscles*
- *2- Nerves*
- *3- Arteries*
- *4- veins*
- *5- Lymph nodes*

# 1- muscle

## Inferior belly of omohyoid

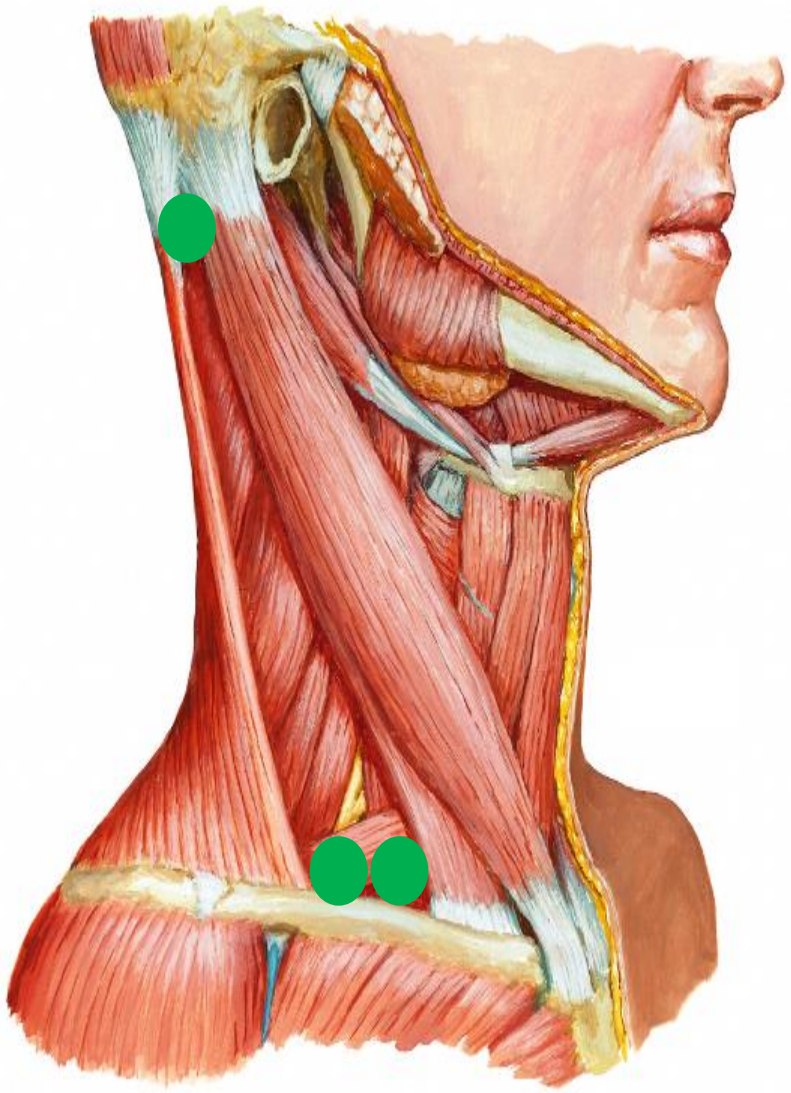


- It divides the posterior triangle into :
  - Large occipital triangle (above it)
- Small supra-clavicular triangle (below it)

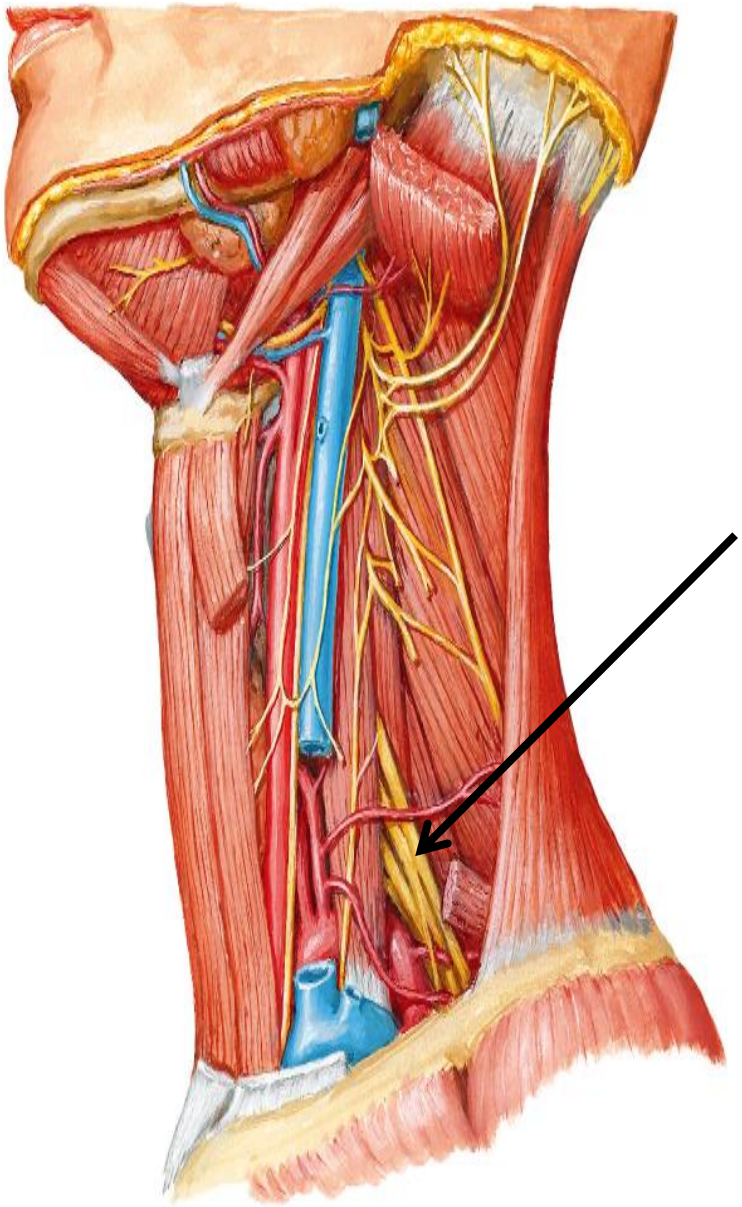
# 2- Lymph Nodes:

**Along posterior border of sternomastoid:**

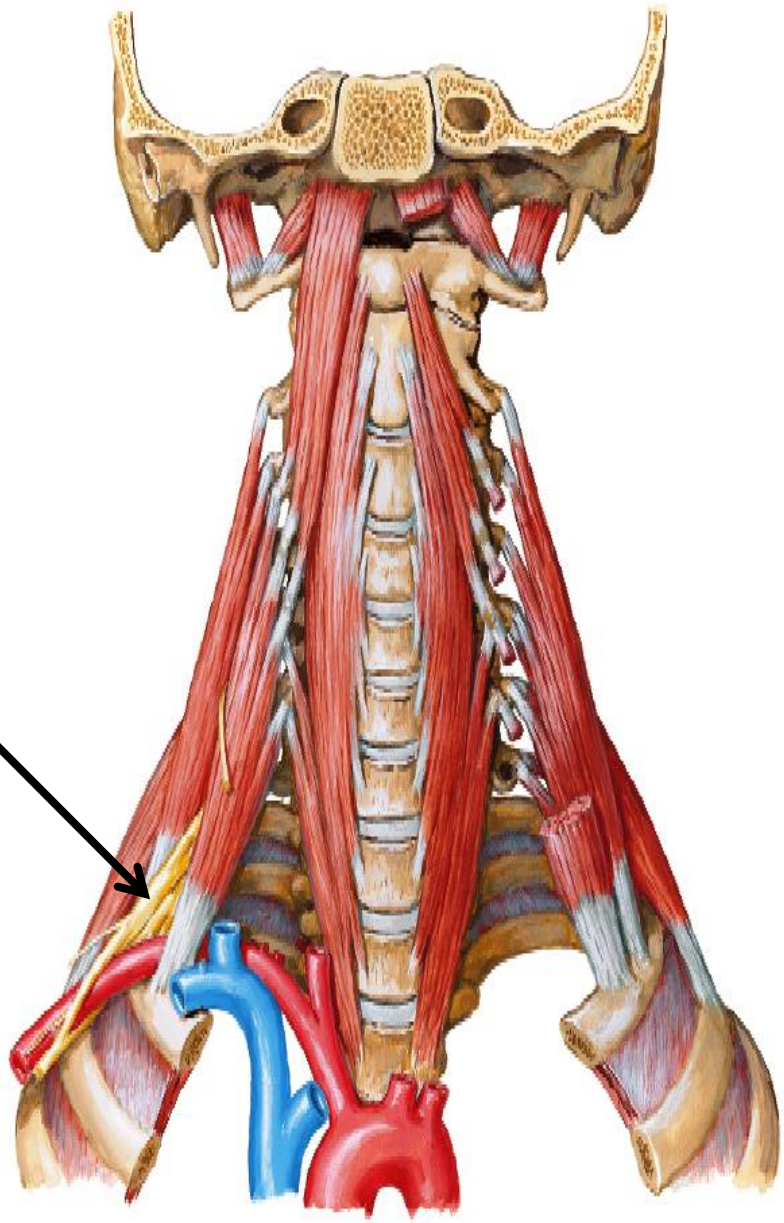
- **Supraclavicular L.N.**
- **Occipital L.N.**



# 3- Nerves



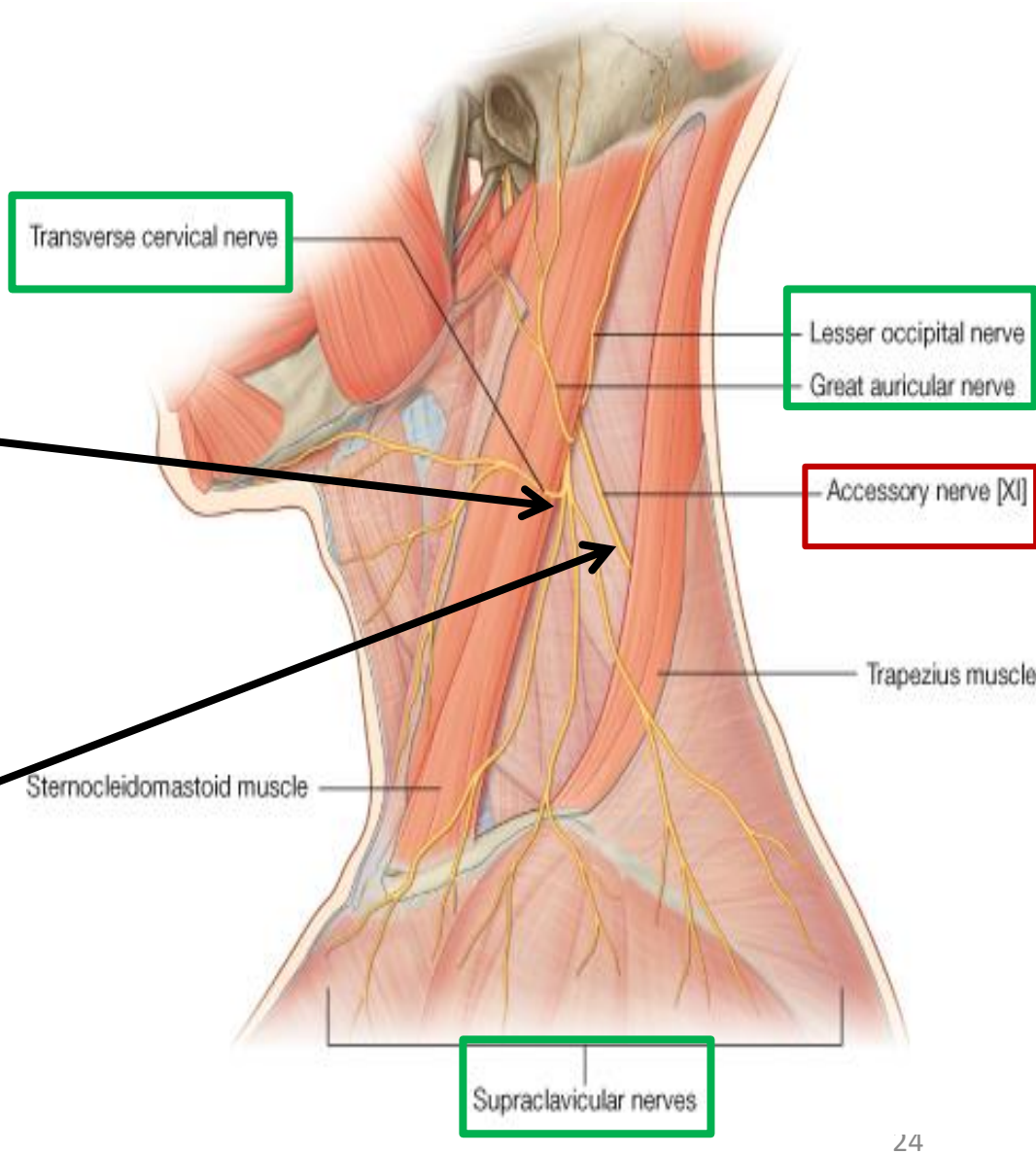
1. Roots & trunks of brachial plexus



# Nerves

**2. Four cutaneous branches of cervical plexus**

**3. Spinal accessory nerve**



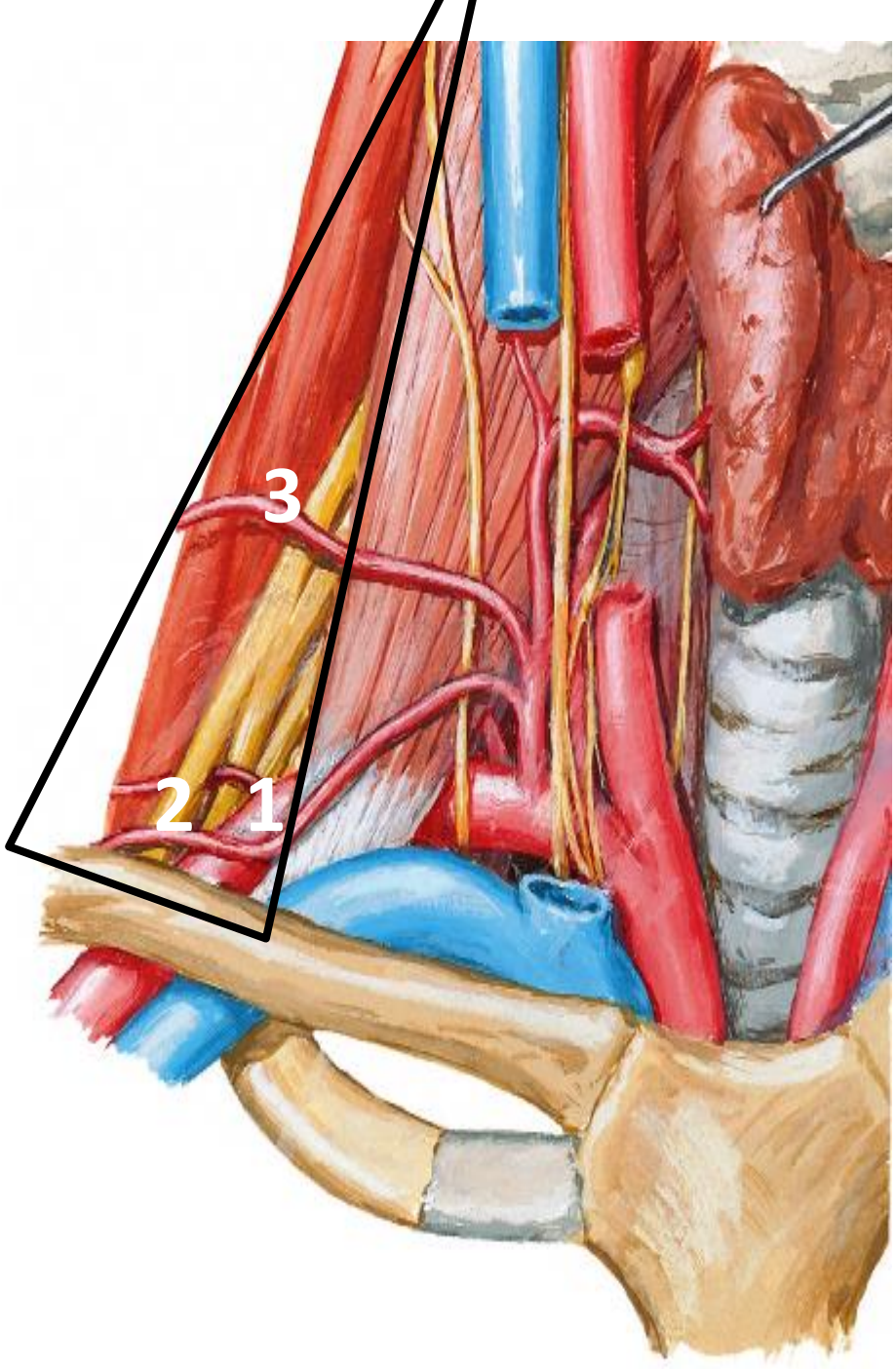
# 4- Arteries

## In the lower part of triangle

1. 3rd part of subclavian artery
2. Suprascapular artery
3. Transverse cervical artery

## At the apex

4. 3rd part of occipital artery



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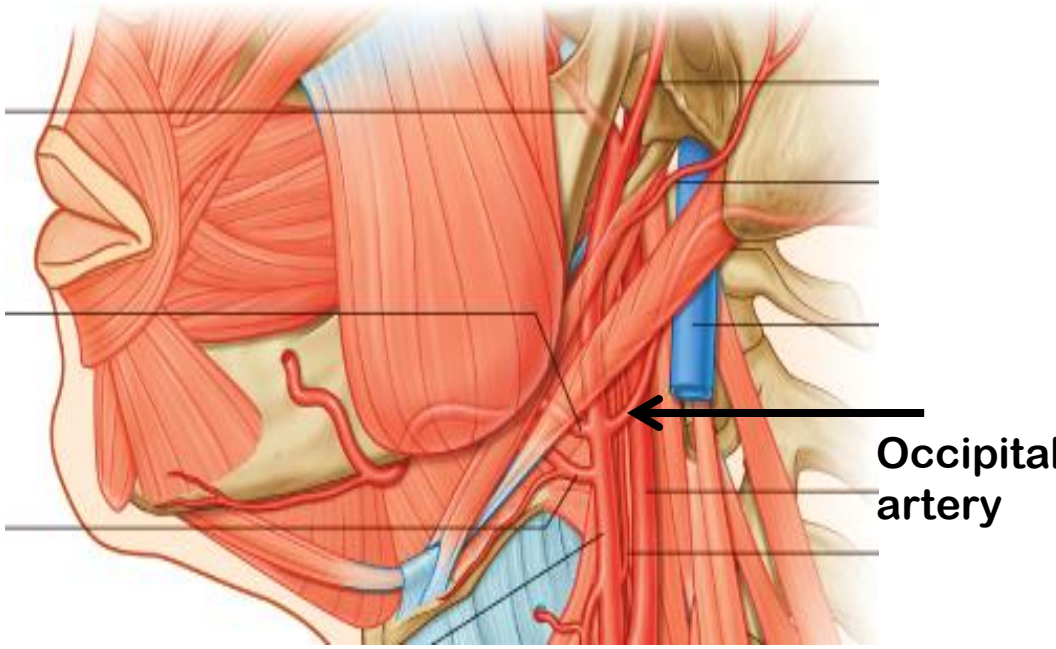
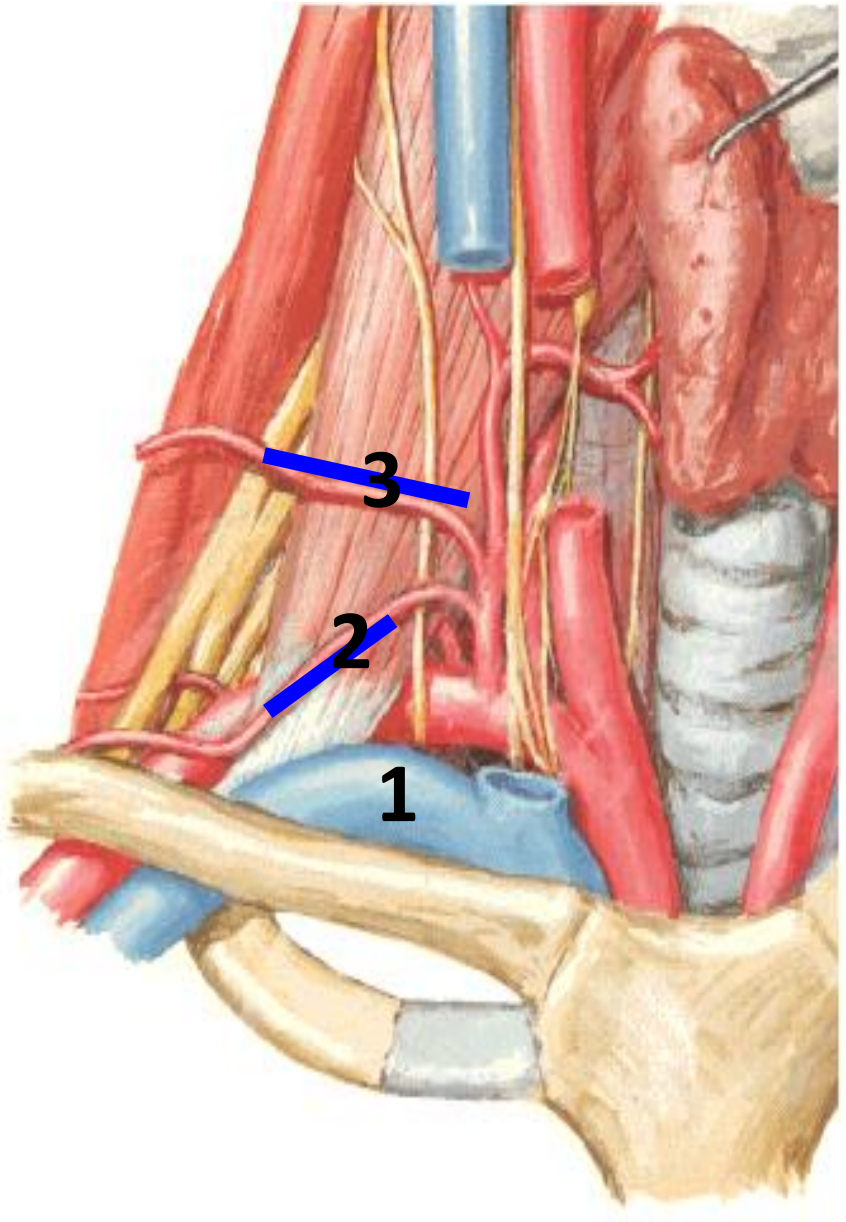


# 5- Veins

1. Subclavian vein
2. Suprascapar vein
3. Transverse cervical vein
4. Lower part of external jugular v



# Veins

1. Subclavian vein
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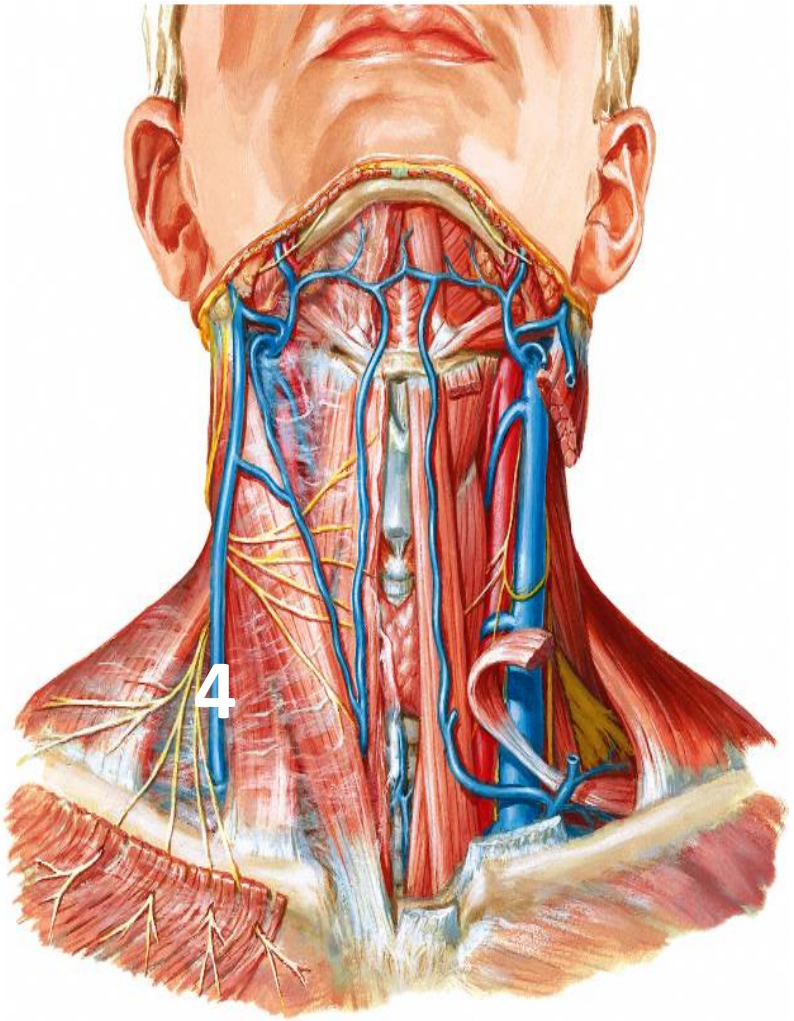
4. Lower part of external jugular v




**Do you remember arteries??????**

# Check yourself

**A one-year-old boy was brought to the hospital because her parents noticed that the child held her head to one side. On examination, the girl's head was found to be tilted towards the right side and the face turned to the left side and upwards. The parents gave a history of birth trauma to the soft tissues of the neck.**

1. Name the muscle and its side involved in birth injury in this case?
2. What is the clinical condition called?
3. Why is this muscle considered as an anatomical landmark in the neck?
4. Give the nerve supply of this muscle?

# Check yourself

**One of the following muscles is content of the posterior triangle,**

A) Inferior belly of omohyoid

B) Digastric muscle

C) sternomastoid

D) Trapezius

E) Levator scapulae

# Check yourself

**The carotid sheath and its contents may be safely retracted as a unit during surgical procedures of the neck. The contents of the carotid sheath include all of the following structures EXCEPT the:**

a. common carotid artery

b. internal carotid artery

c. internal jugular vein

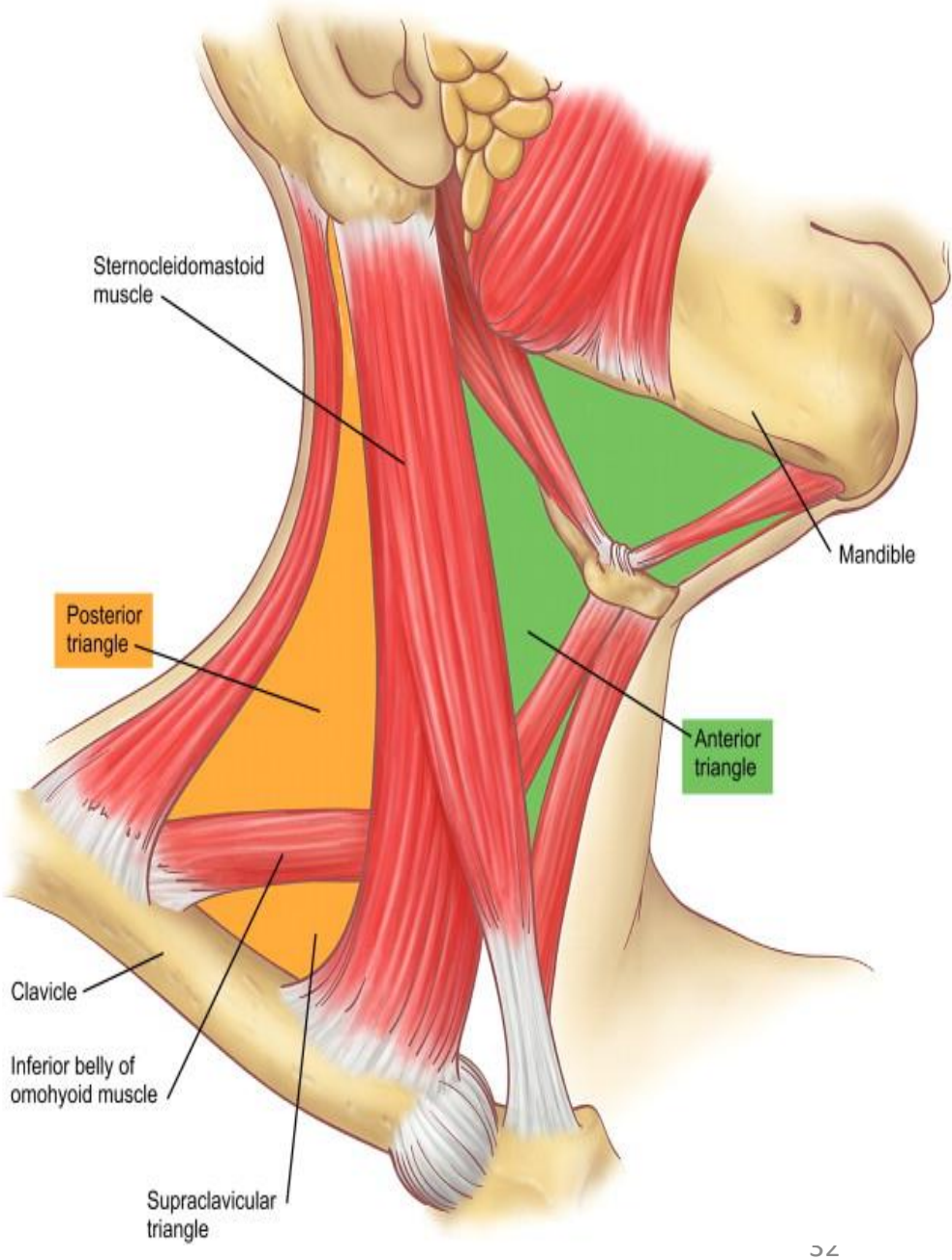
d. sympathetic trunk

e. vagus nerve

# *Anterior triangle*

## *Definition:*

- A large triangular space on each side of the neck situated in front of sternomastoid muscle




***-The triangle is inverted with its apex down its base up***

# Boundaries of the Anterior triangle

- **Apex: down**

  *manubrium sterni.*

- **Base: up**

  *by the lower border of the body of mandible,*

  *and a line extending from the angle of mandible to the mastoid process.*

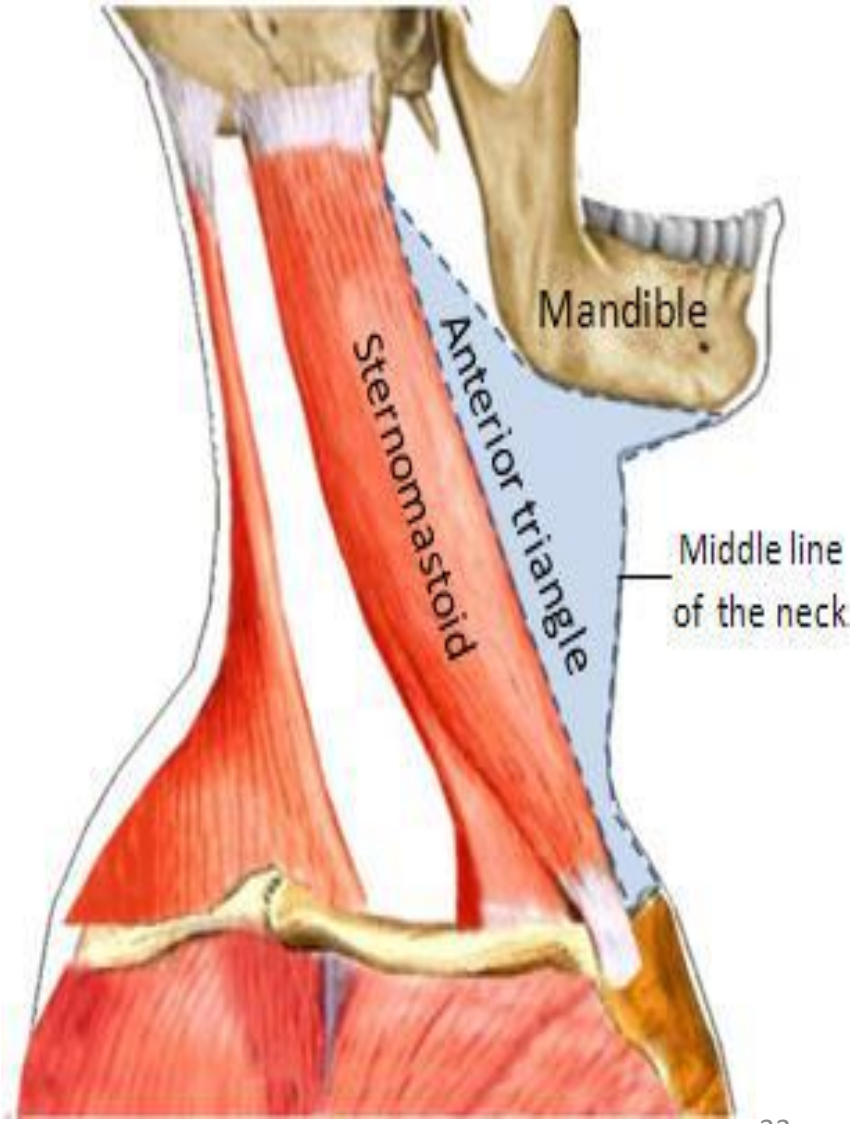
- **Anterior:**

  *midline of the neck*

  *from chin to manubrium sterni.*

- **Posterior:**

  *sternocleidomastoid. Its anterior margin*



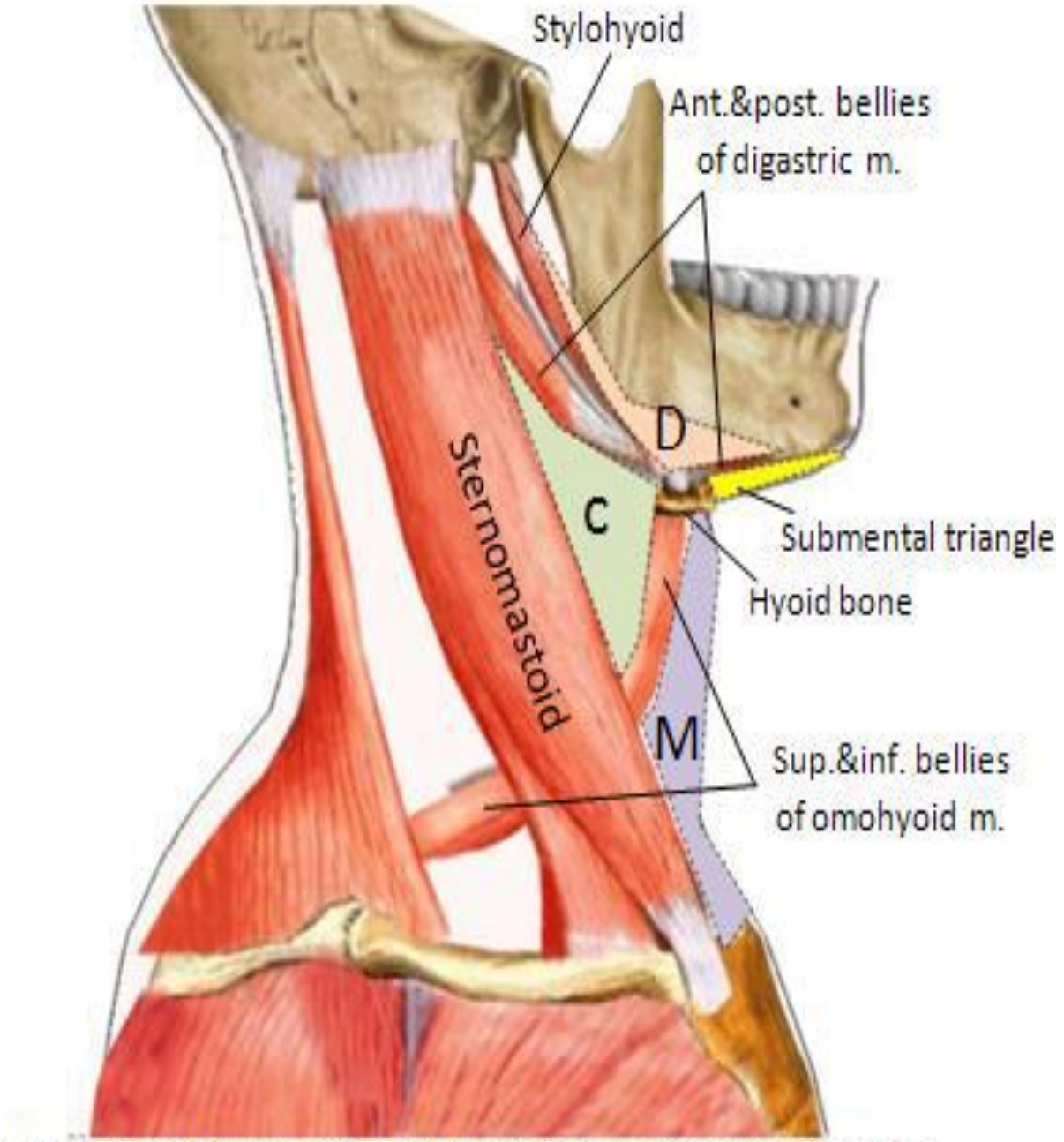
# Division of the Anterior triangle :

## divided by Y shaped

-hyoid bone .

-3 muscles attached to it (2 digastric + superior belly of omohyoid)

## -into 4 triangles on each side.

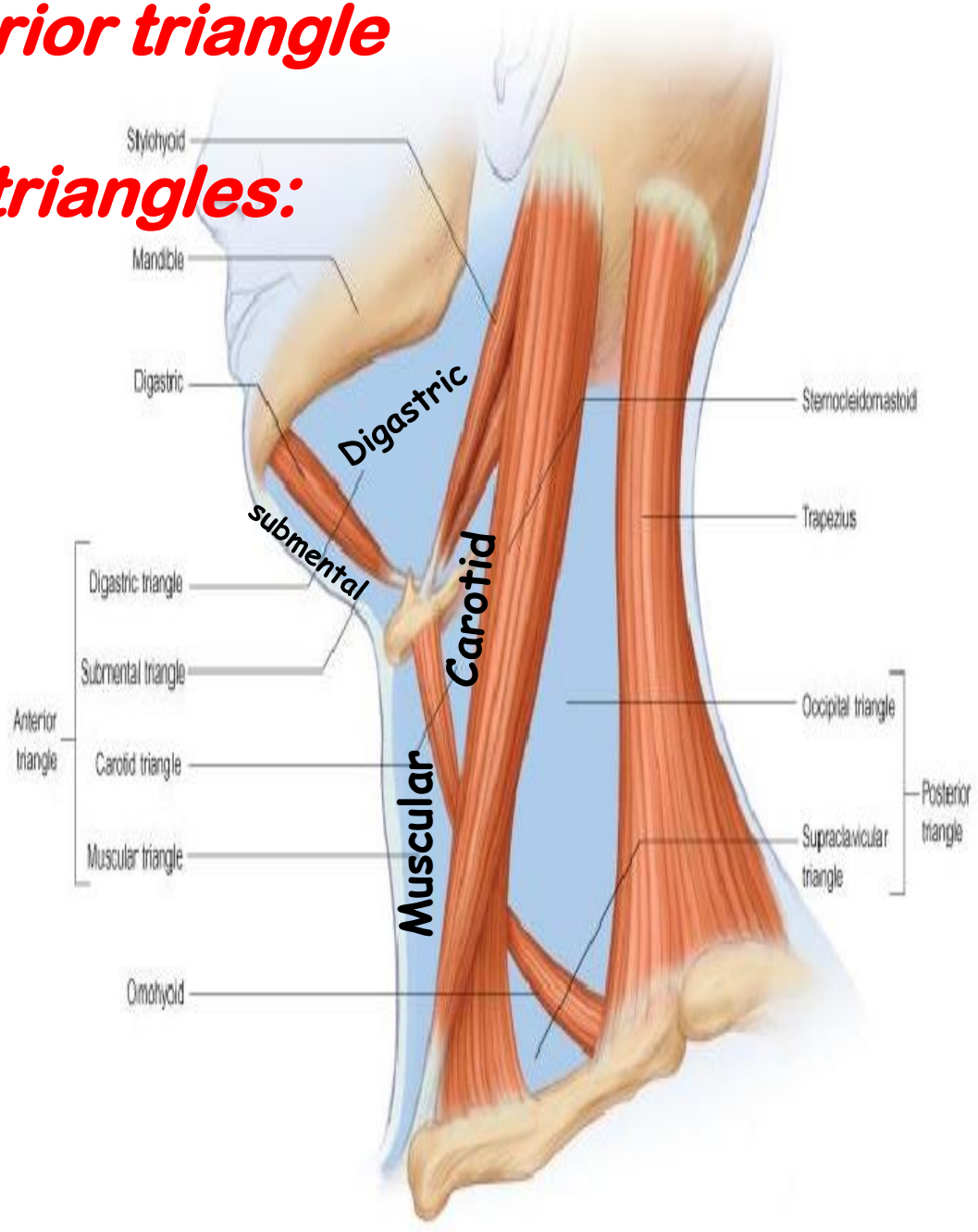



D= digastric triangle, C= carotid triangle, M= muscular triangle

# Divisions of the anterior triangle

## It is divided into 4 triangles:

1. Digastric triangle
2. Carotid triangle
3. Muscular triangle
4. ½ submental triangle



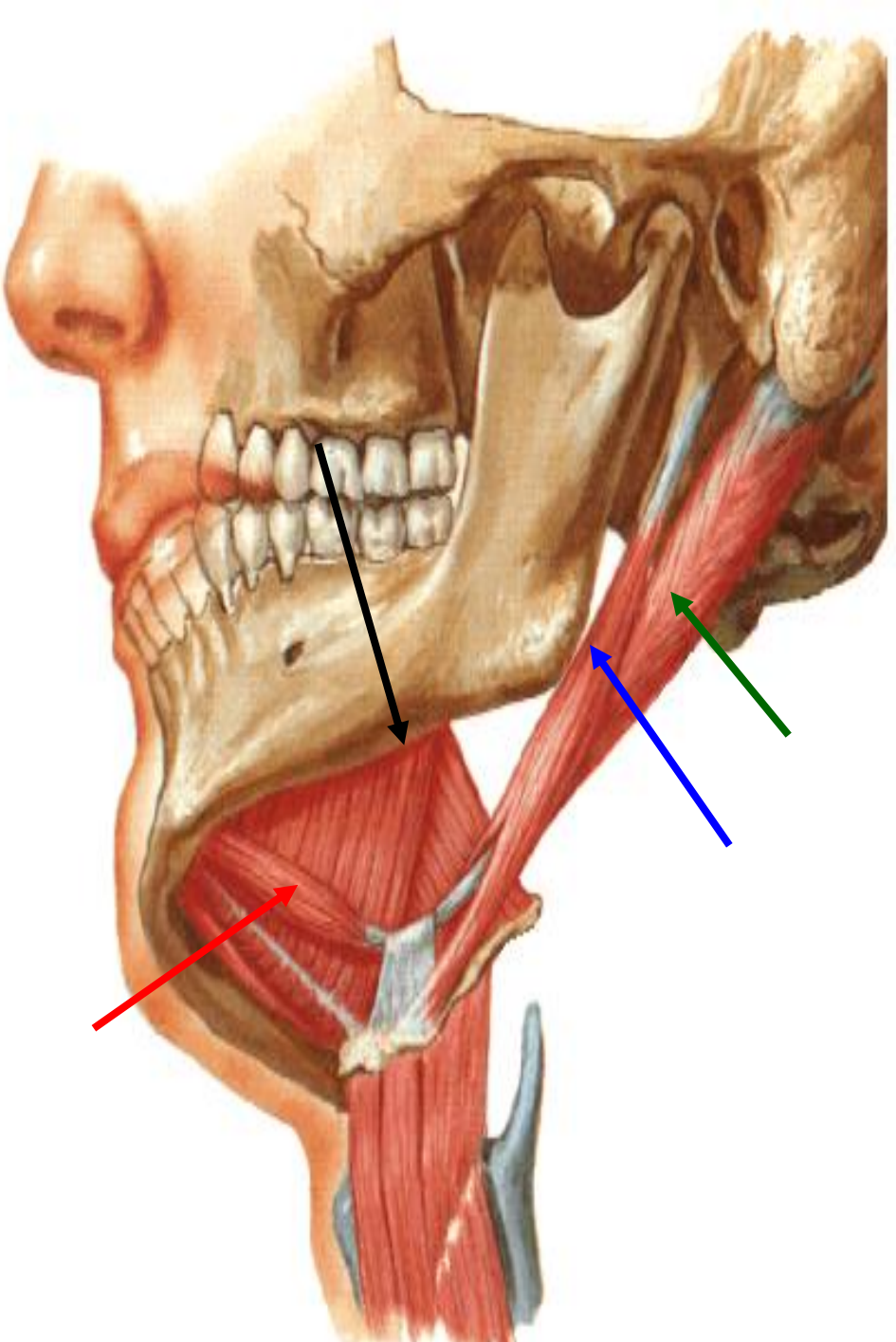
# 1-Digastric

## Boundaries :

-***Anteriorly:*** **Anterior belly of digastric muscle.**

-***Posteriorly:*** **Posterior belly of digastric and stylohyoid muscles.**

-**Superiorly (base):** **Inferior border of mandible and a line drawn from angle of mandible to mastoid process.**



# Roof and Floor of the digastric triangle

## Roof:

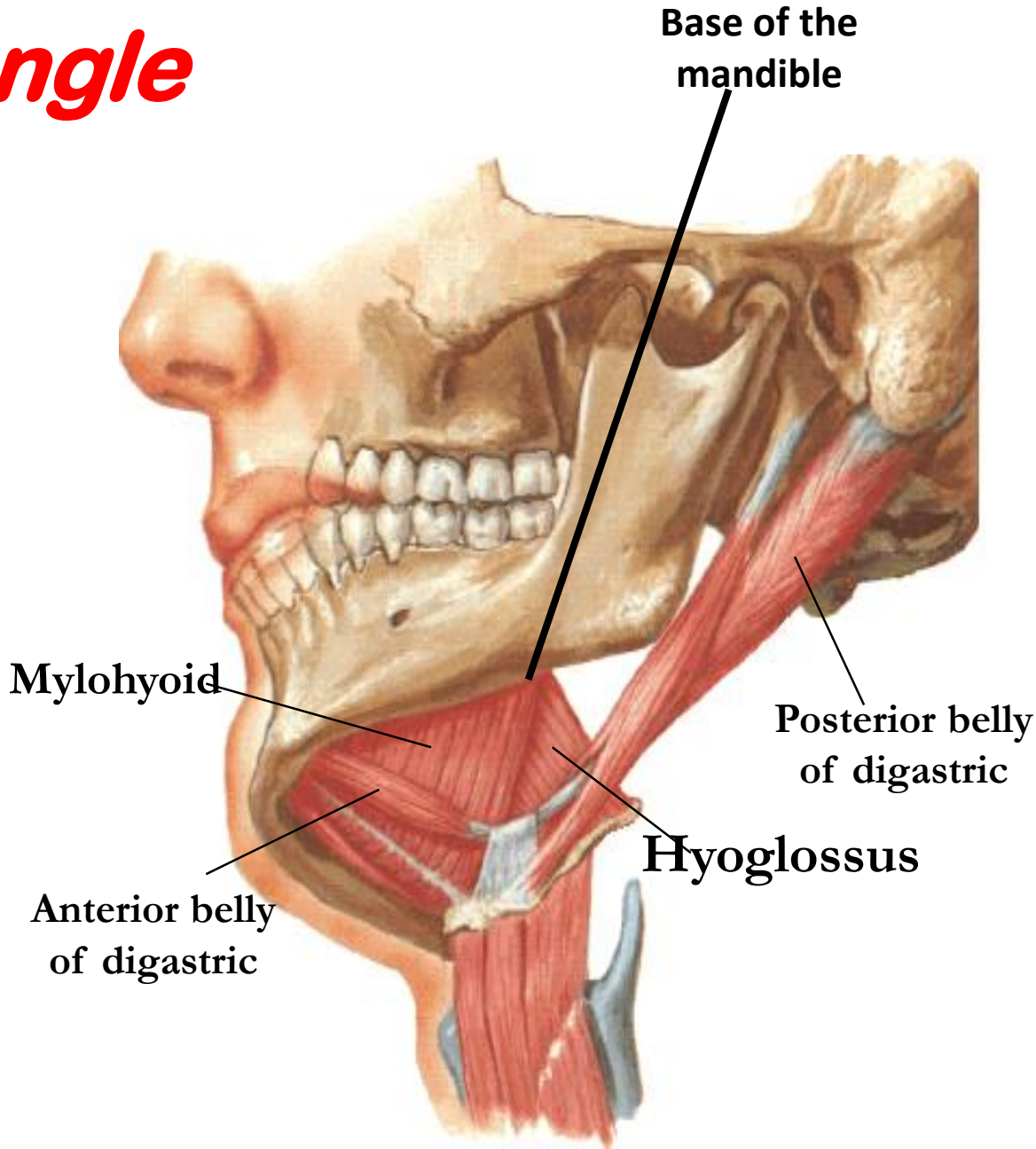
*1-Skin*

*2-Superficial fascia,*

*3-deep fascia, which splits to enclose submandibular salivary gland.*

## Floor:

1. *Mylohyoid and*
2. *Hyoglossus muscles.*

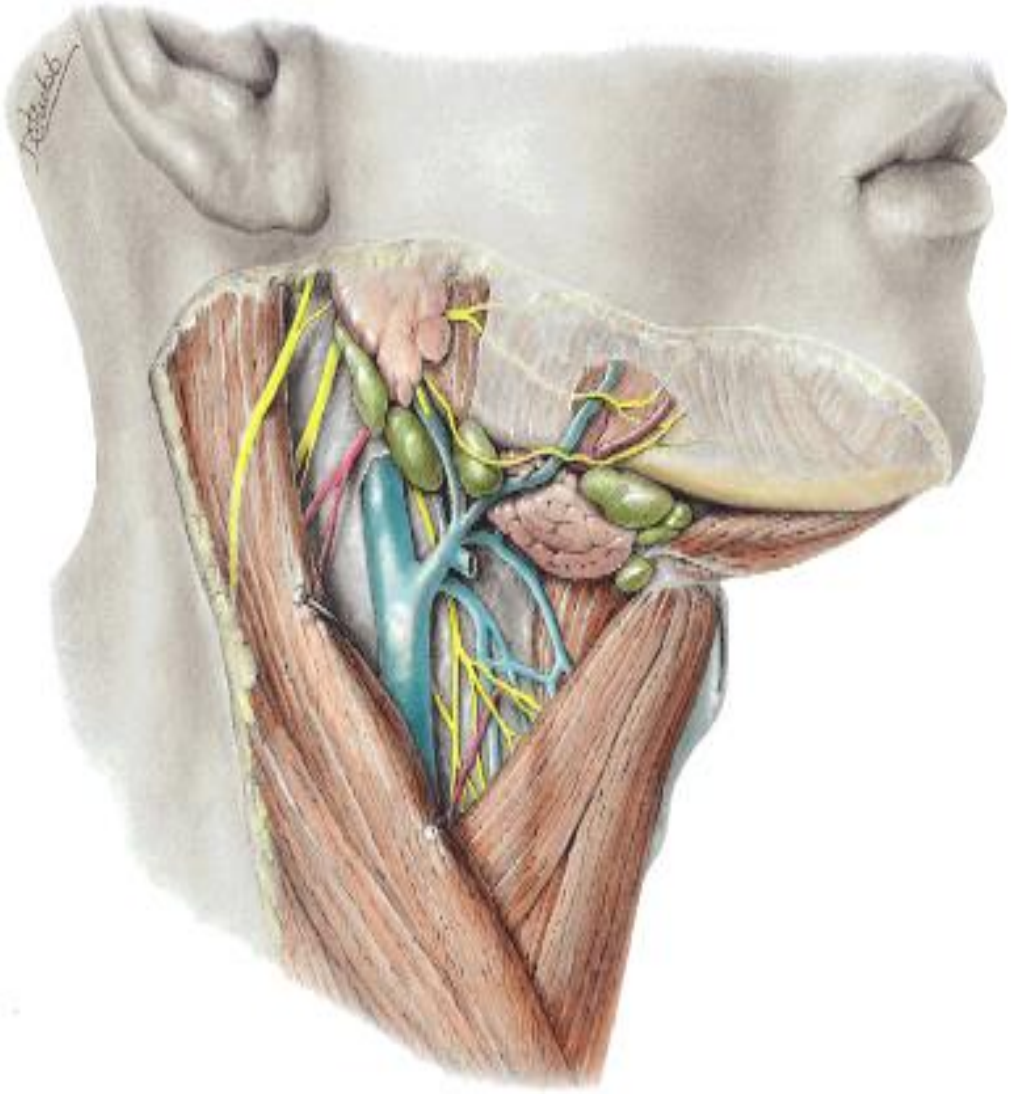


# Contents of the digastric triangle

1- Glands and lymph nods

2- Nerves

3- Vessels

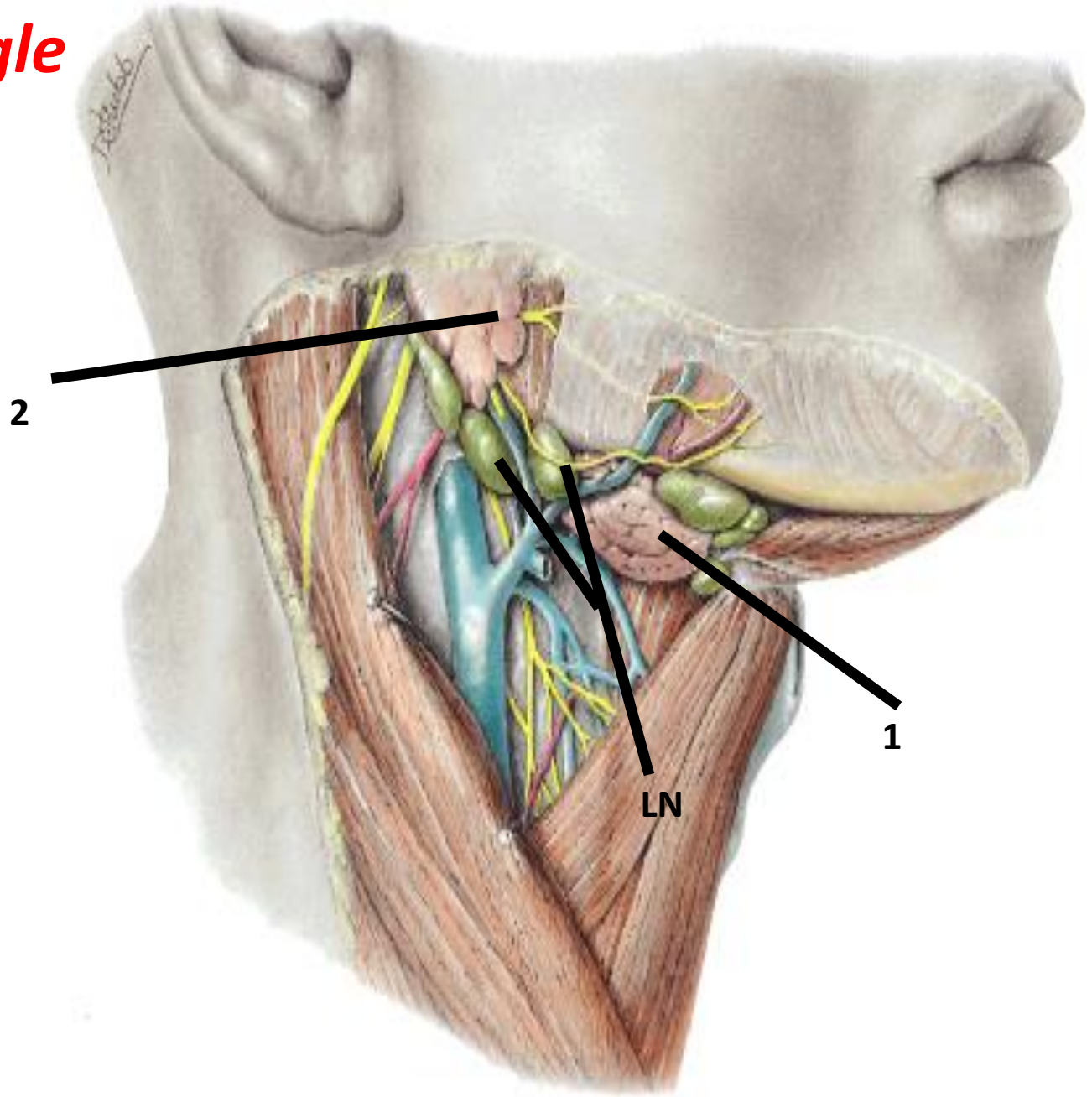


# *Digastric triangle contents:*

## 1-Glands and lymph nodes

**1-Submandibular Gland.** and submandibular LN

**2-Parotid Gland.**



## *Digastric triangle contents:*

## *2-Nerves*

**Cranial**

- 1- vagus nerve x
- 2- spinal accessory XI
- 3- hypoglossal nerve XII

**Muscular**

- Nerve to mylohyiod

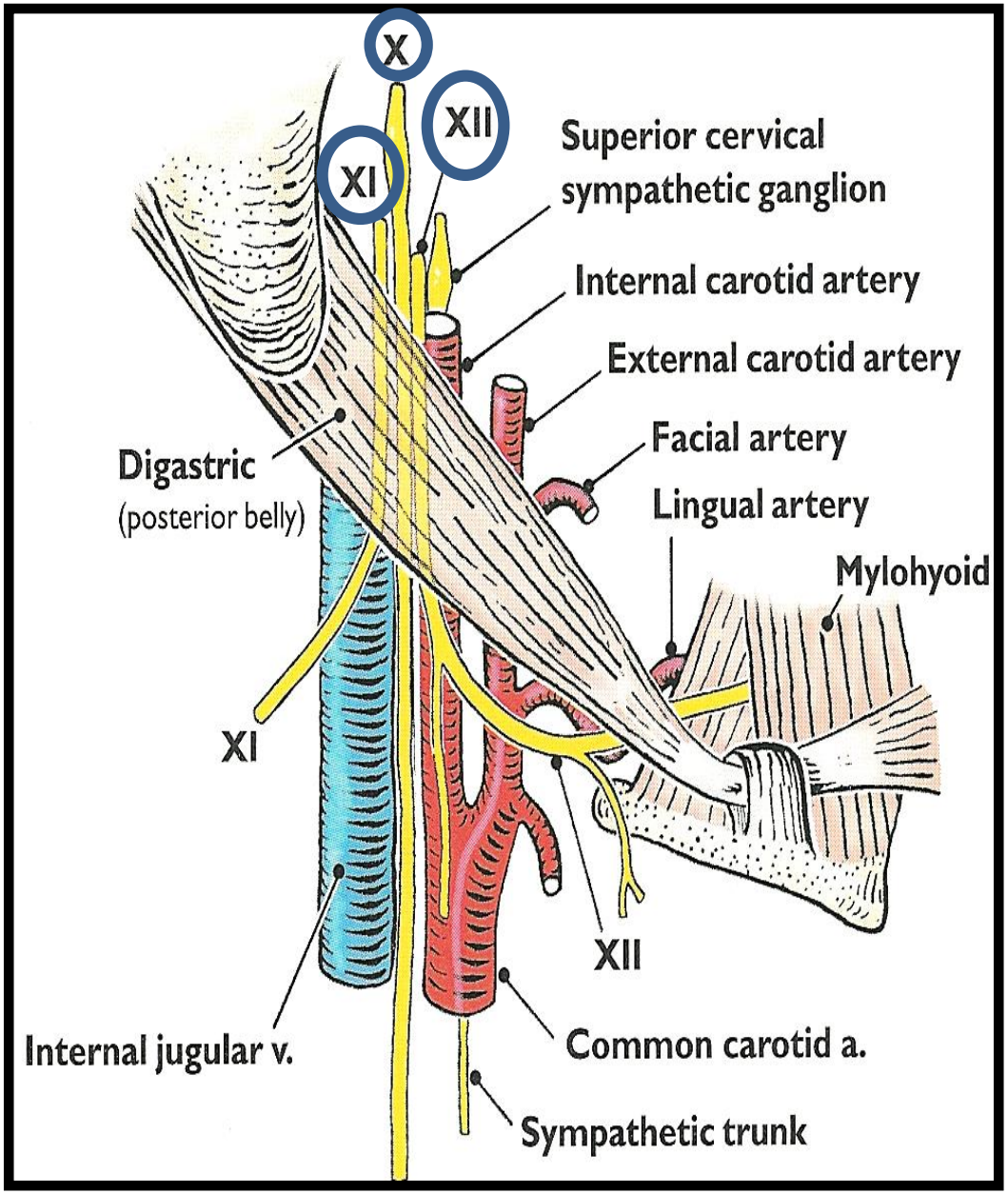
## *3-Vessels*

**Vessels:**

ECA, ICA, IJV

Facial artery (a branch from ECA)

Facial vein



# Accessory Nerve (XI):

*formed of 2 separate parts spinal &cranial*

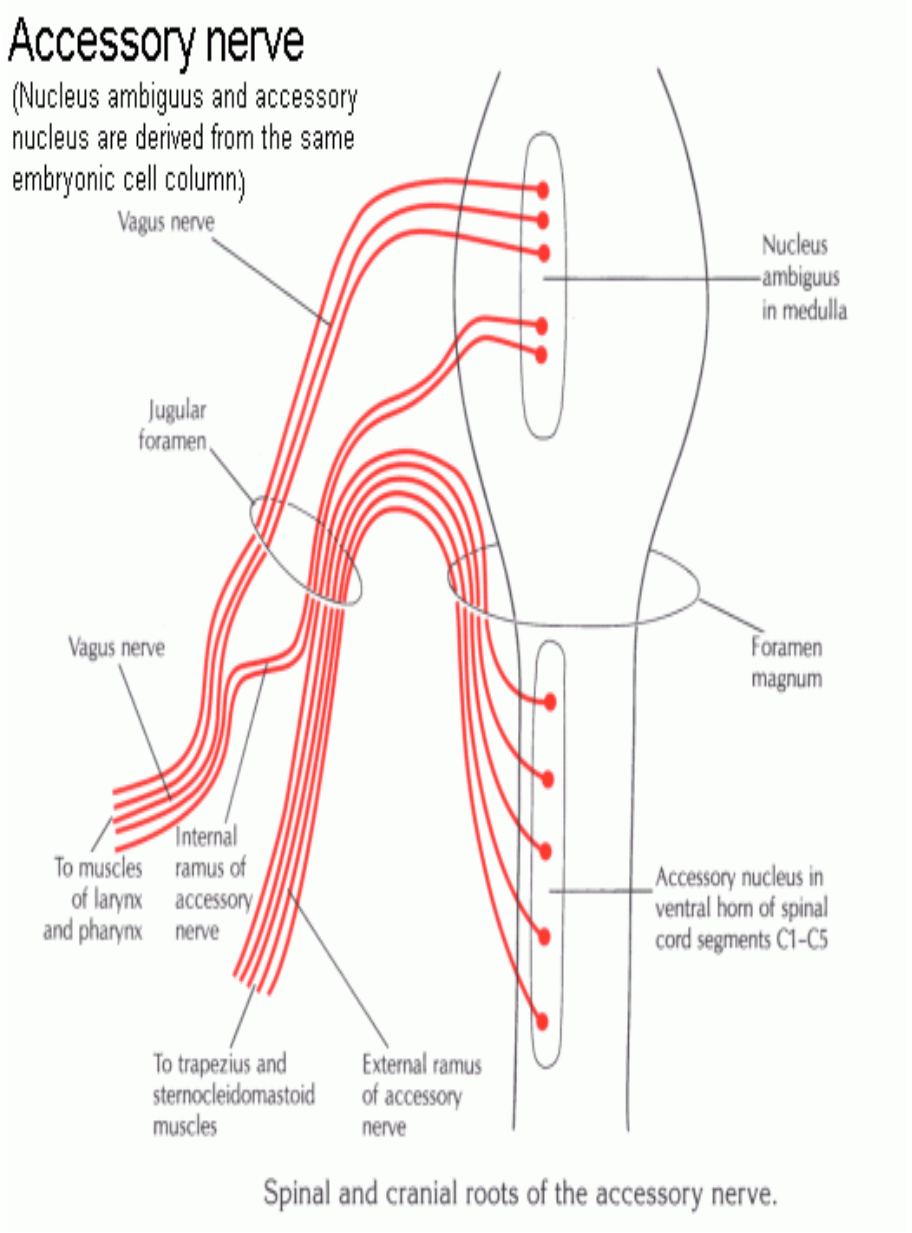
**Cranial Part of Accessory:** - Exit from brain: (Medulla) groove between olive and inferior cerebellar peduncle below vagus nerve.

- It runs to jugular foramen where it unites with spinal part.

- Exit from skull: Through jugular foramen with vagus and glossopharyngeal nerves.

- After its exit from jugular foramen, it separates from spinal part and unites with vagus.

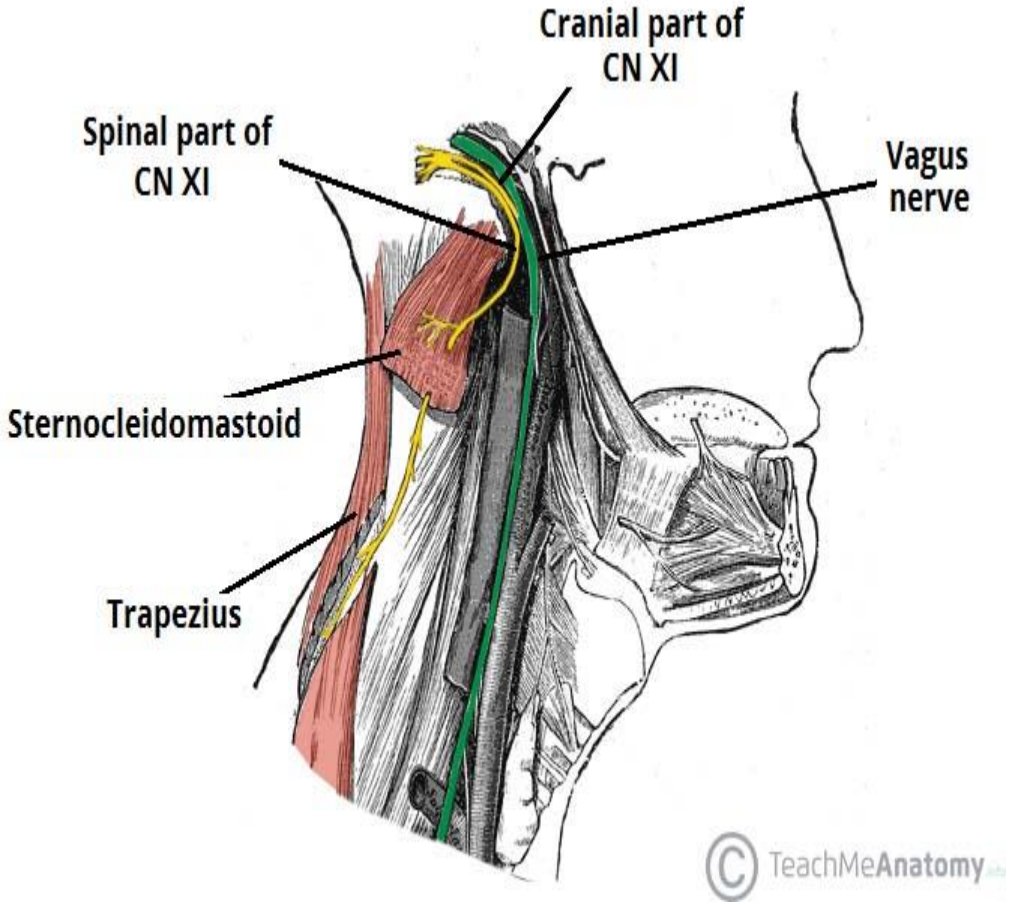
- It is distributed to pharynx, palate and larynx through pharyngeal and recurrent laryngeal branches of vagus




Spinal and cranial roots of the accessory nerve.

# Spinal Part of Accessory:

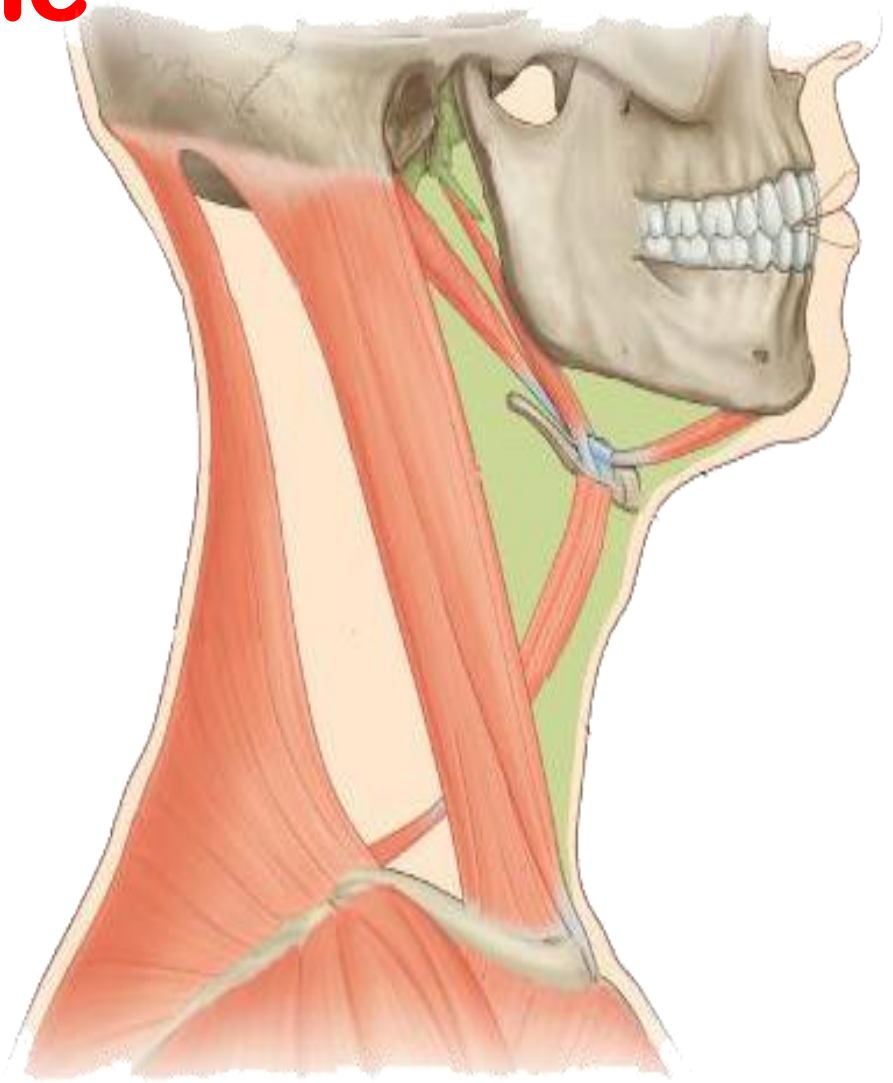
- Axons of nerve cells in spinal accessory nucleus (found in upper 5 cervical segments).
- Ascend and enter cranial cavity through foramen magnum.
- Joins cranial root as they pass to jugular foramen.
- Separates from cranial root and supplies sternomastoid and trapezius



# 2-Submental triangle

## Definiton:

-A median triangle that is formed by meeting of the two triangles superiorly.between the chin and hyoid bone



# 2-Boundaries of Submental triangle:

- **on right side :**

**Anterior belly of digastric**

- **on left side :**

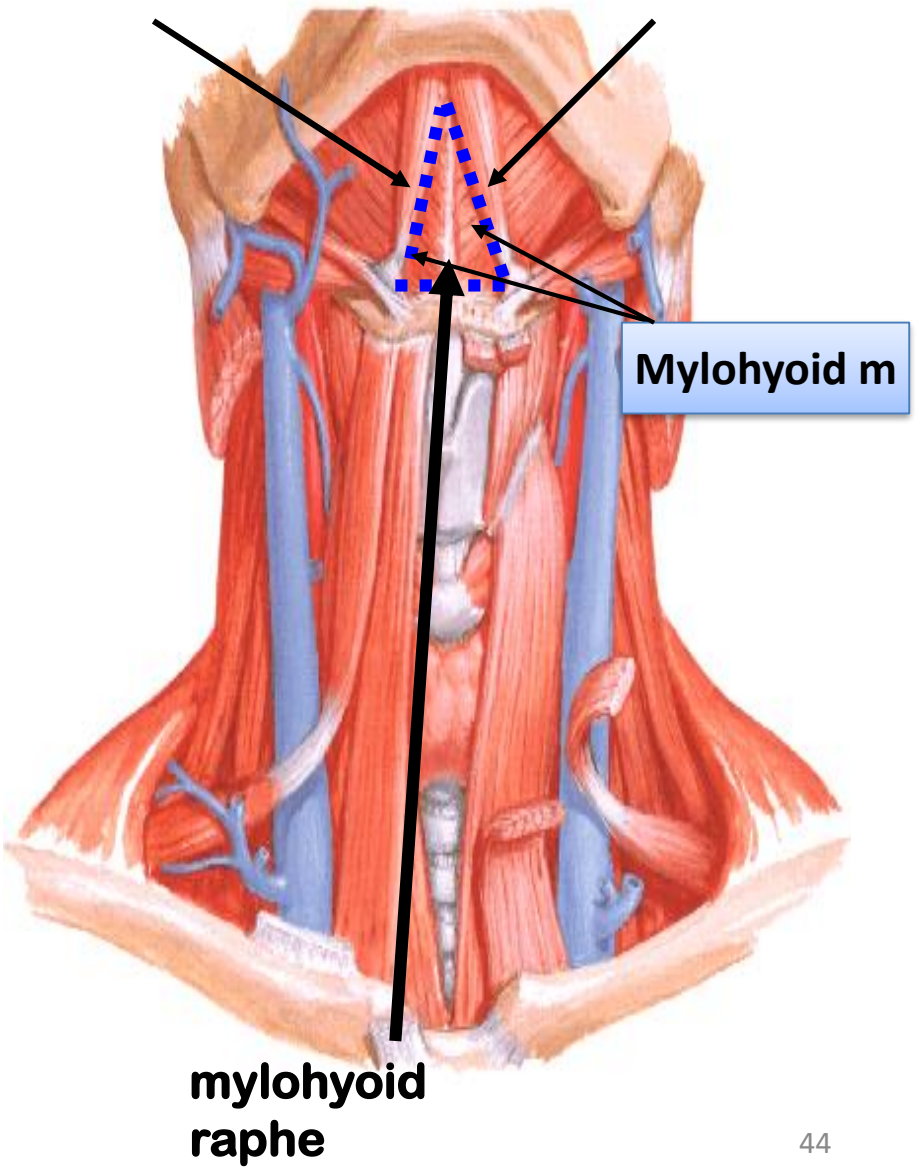
**Anterior belly of digastric**

- **inferiorly :**

**Hyoid bone**

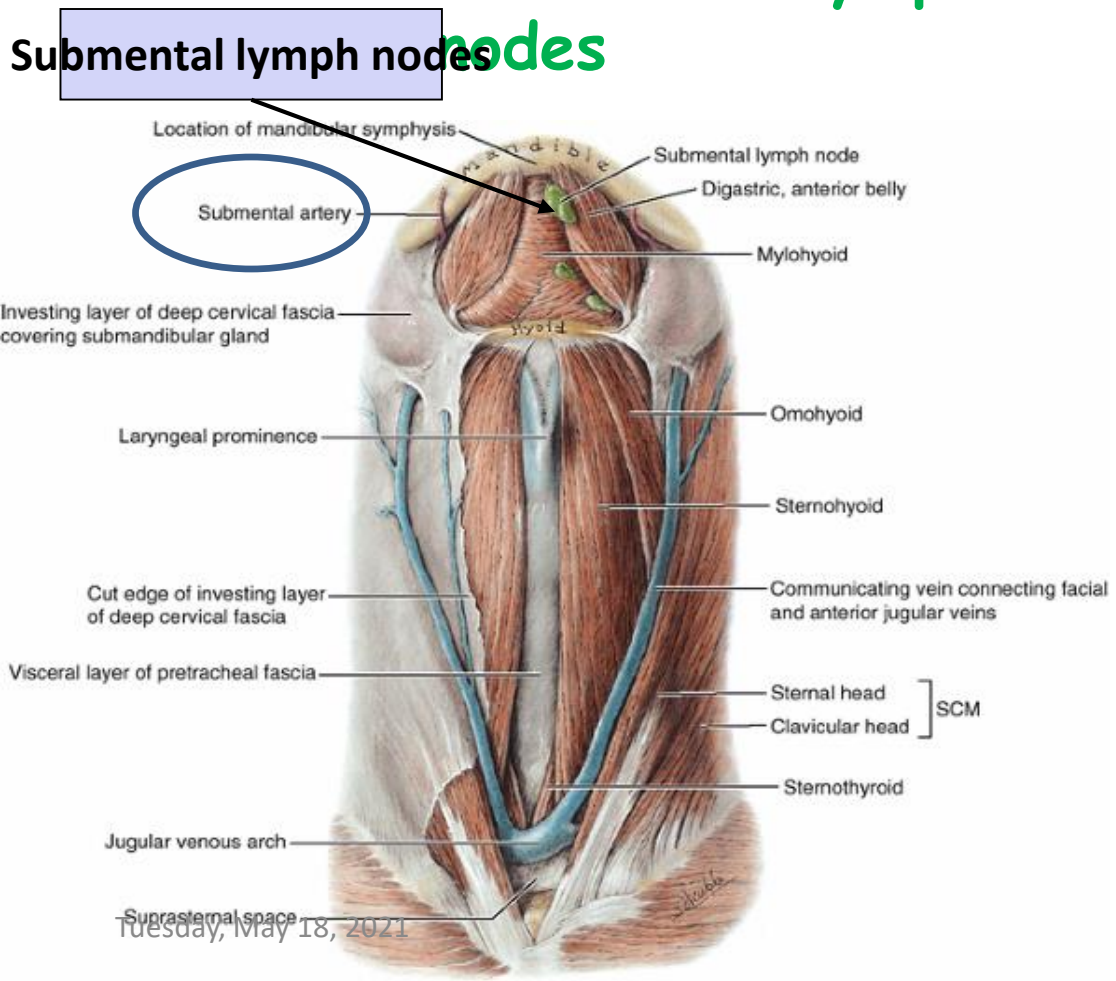
- **Floor:**

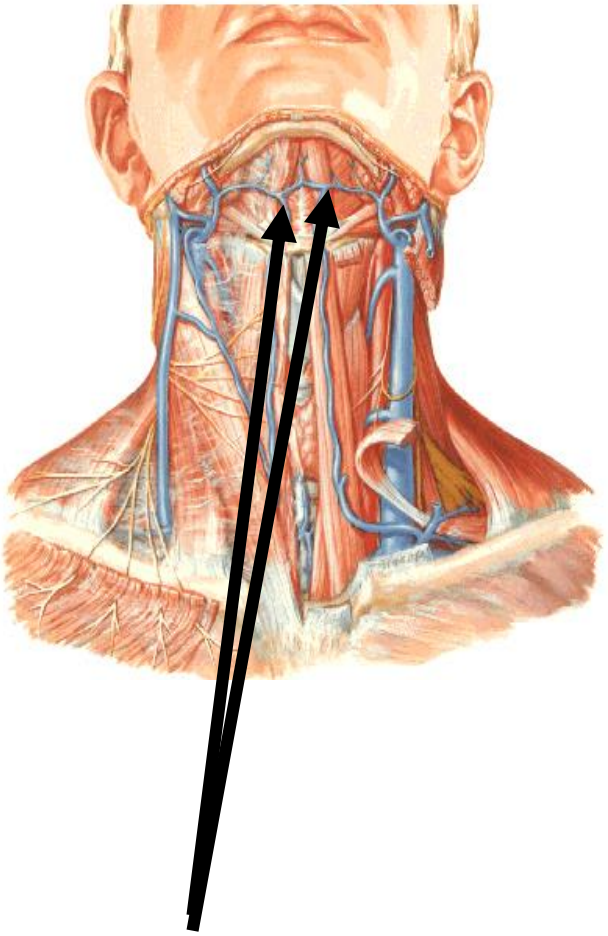
**2 mylohyoid muscles meeting at mylohyoid raphe**



# 2-Contents of submental triangle

1. Submental arteries
2. Submental veins
3. Sub mental lymph nodes



Submental veins

# 3- Boundaries of *Carotid triangle*

**-Superiorly:**

**Posterior belly of the digastric.**

**-Anteriorly:**

**Superior belly of omohyoid.**

**-Posteriorly:**

**Anterior border of sternomastoid**

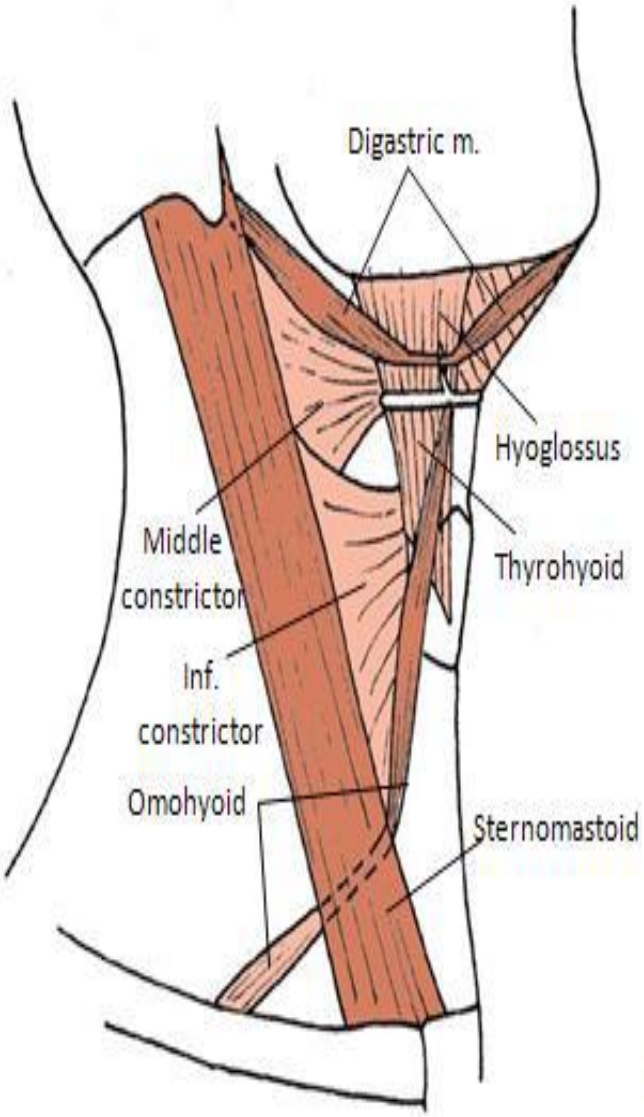
## Roof

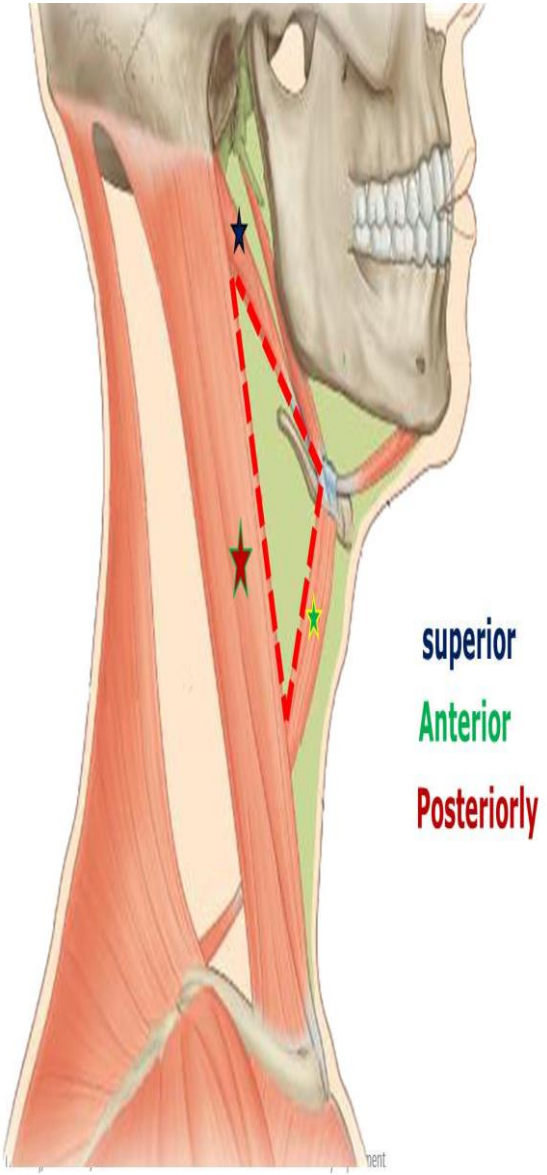
1. **Skin**
2. **Superfisial fascia**
3. **Investing layer of the deep fascia**

## Floor:

**Ant: Hyoglossus and thyrohoid ms.**

**Post: pharyngeal wall**

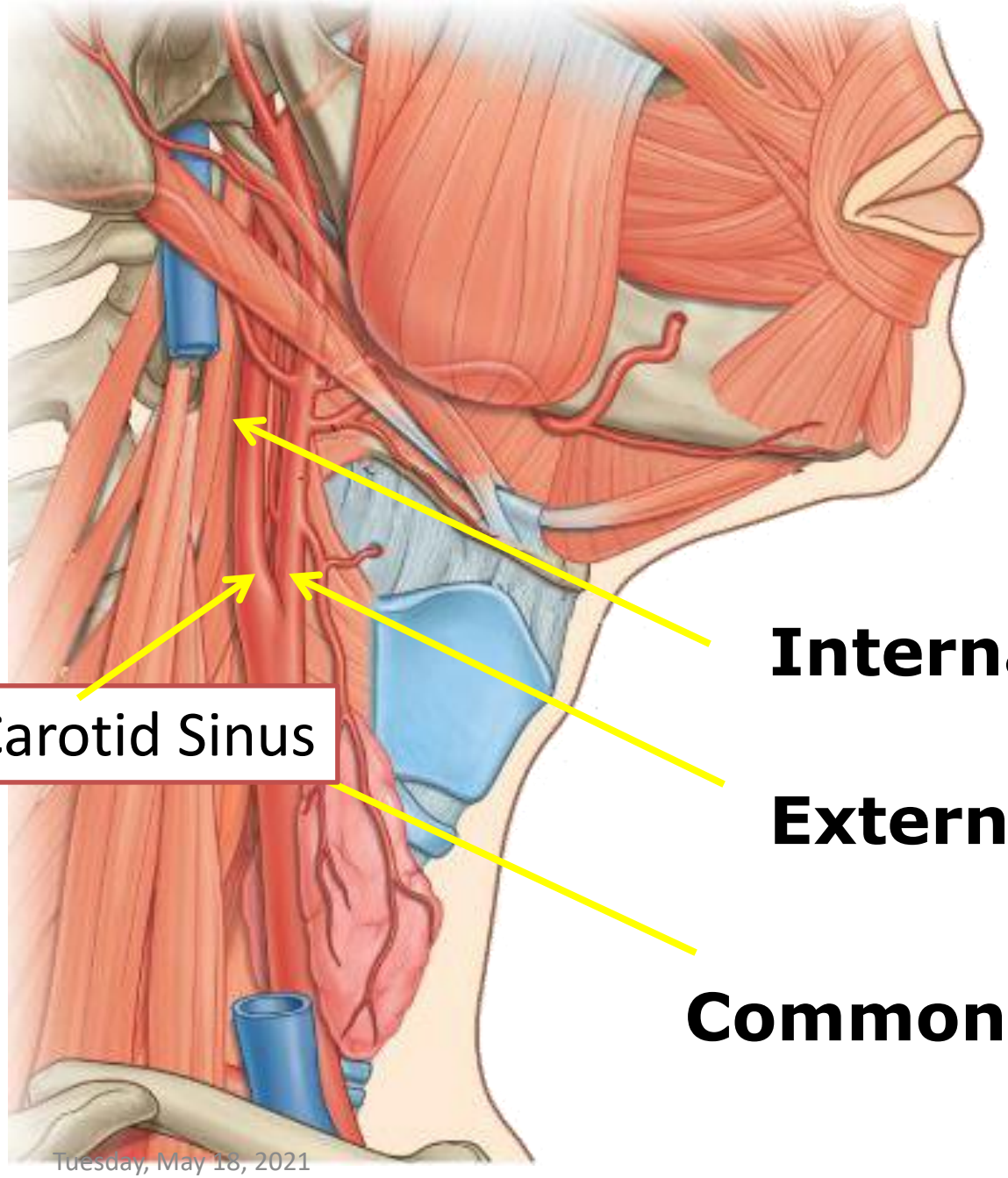


# *3-Contents of carotid triangle*

- 1- vessels
- 2- nerves
- 3- Carotid sheath
- 4- lymph nodes

# Arteries




**Internal Carotid Artery**

**External Carotid Artery**

**Common Carotid Artery**

# 5 Branches of ECA

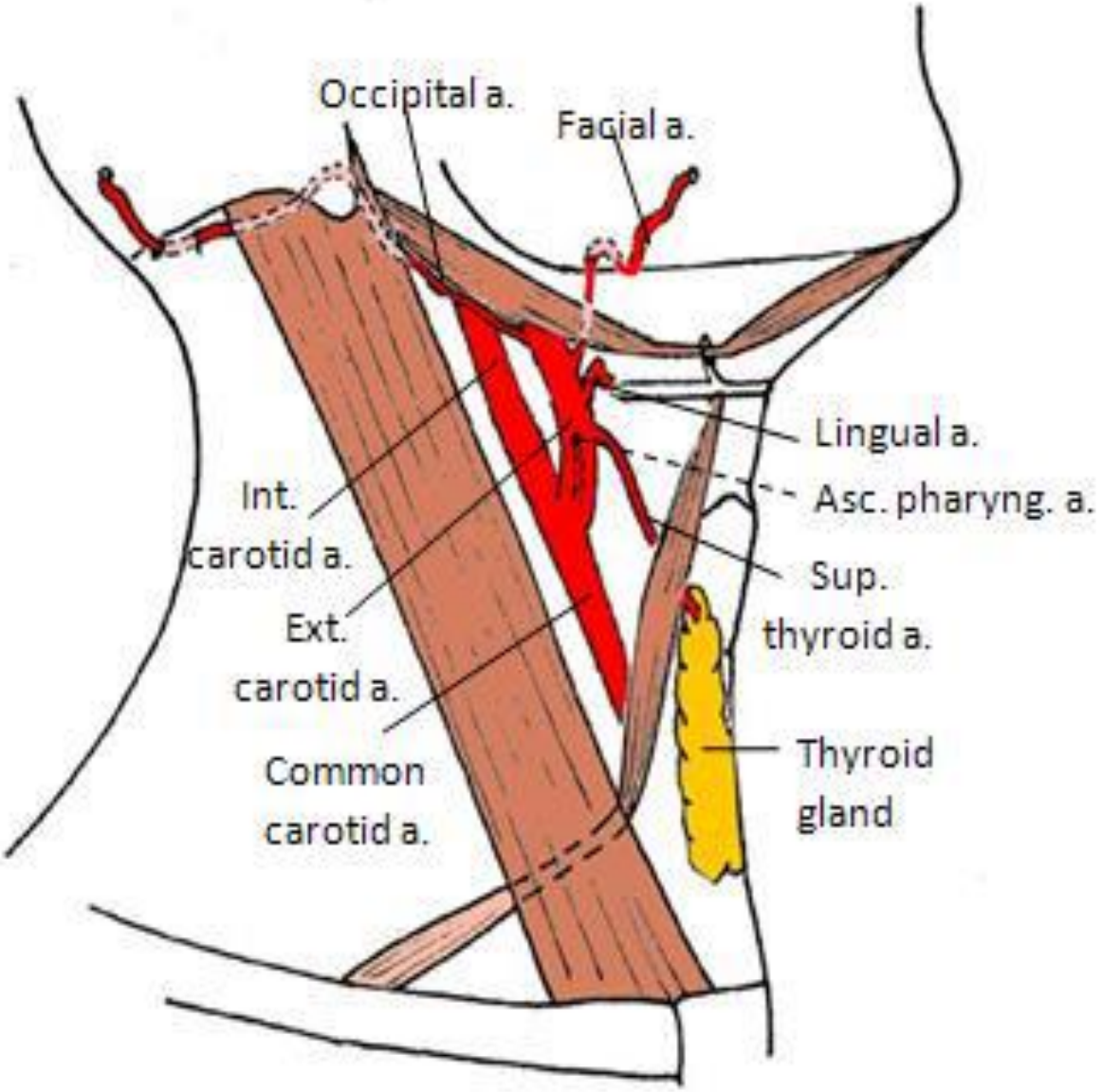
a)Superior thyroid **A**

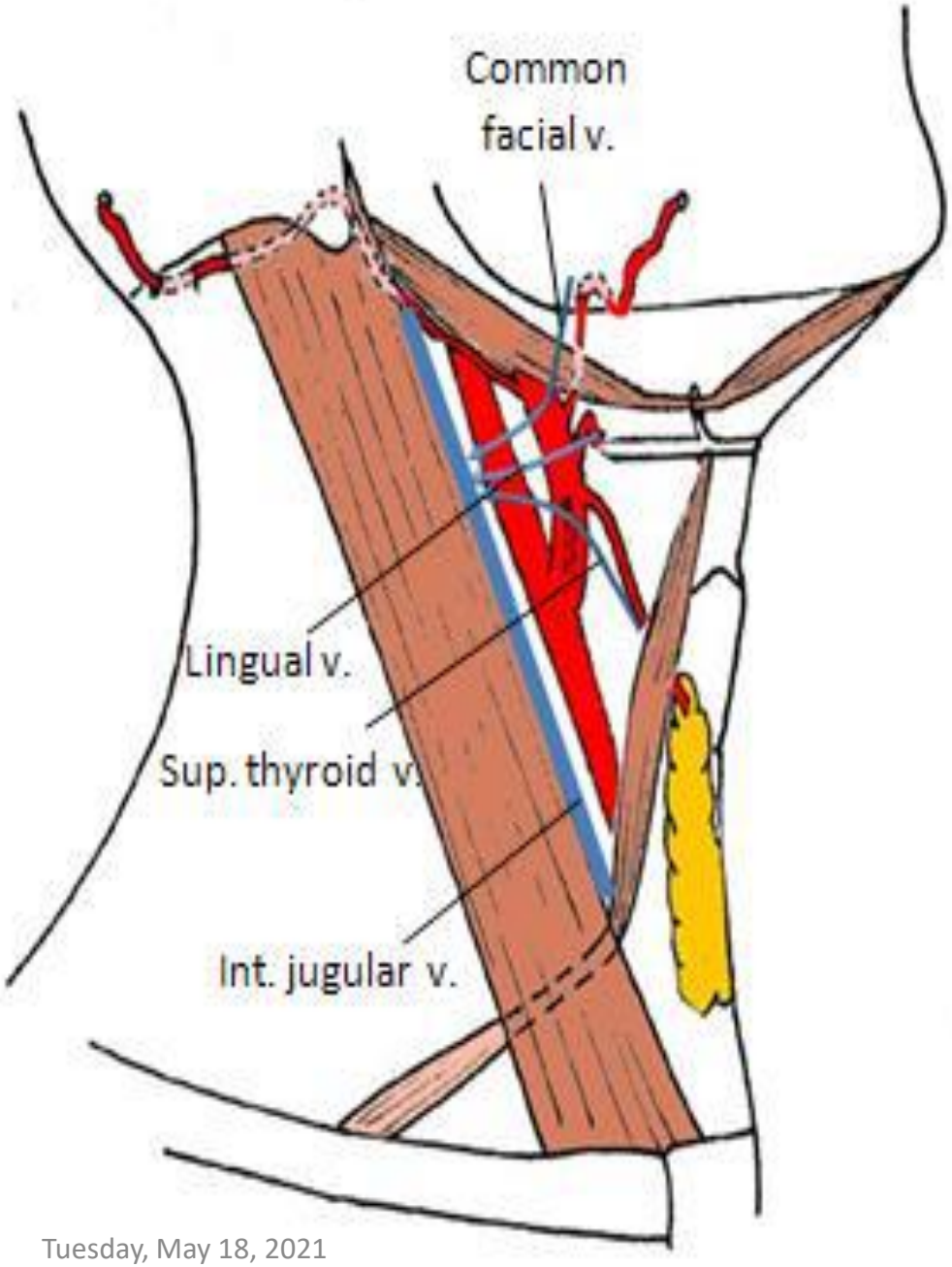
b) Ascending pharyngeal **A**

c) Lingual **A**

d)Facial **A**

e) Occipital **A**






# veins

***Internal jugular veins (IJV)***

***and 4 tributaries***

**1- pharyngeal veins**

**2- lingual vein**

**3- common facial vein**

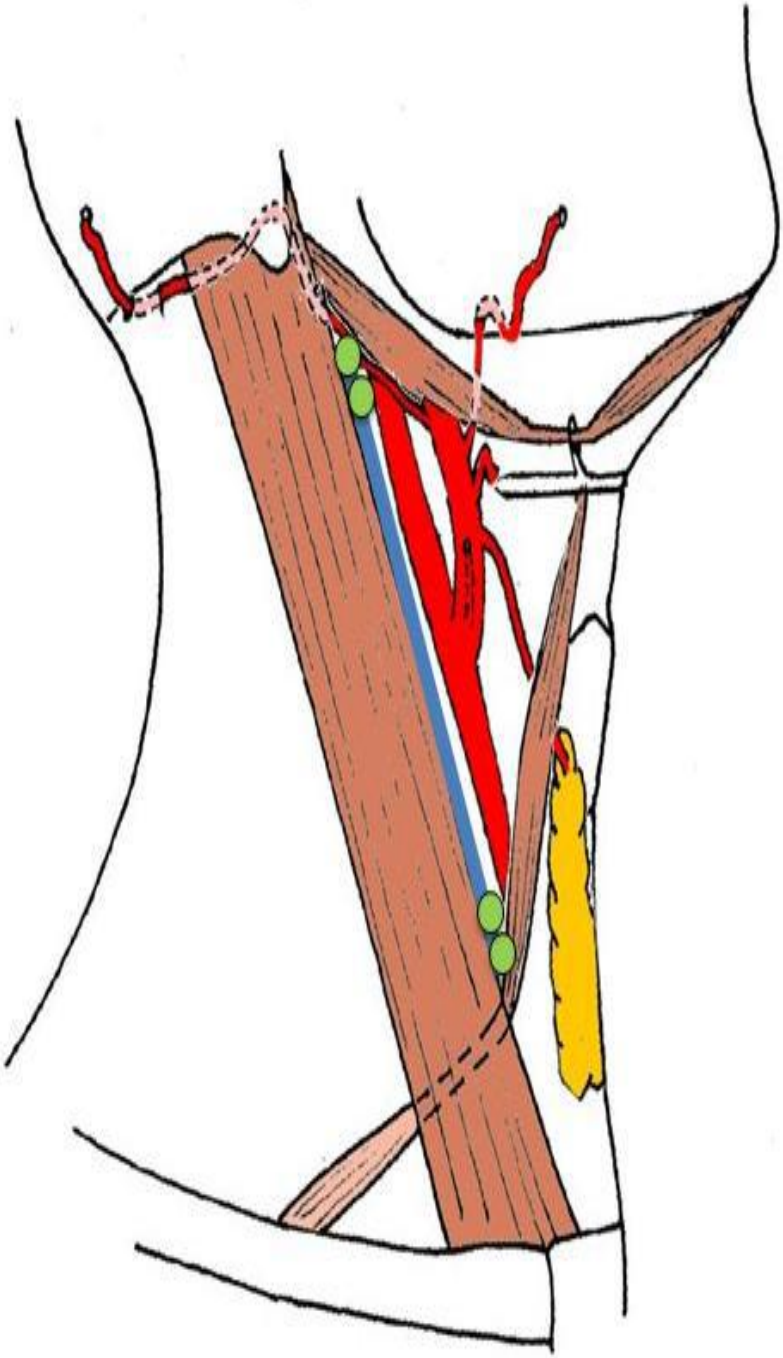
**4- superior thyroid vein**

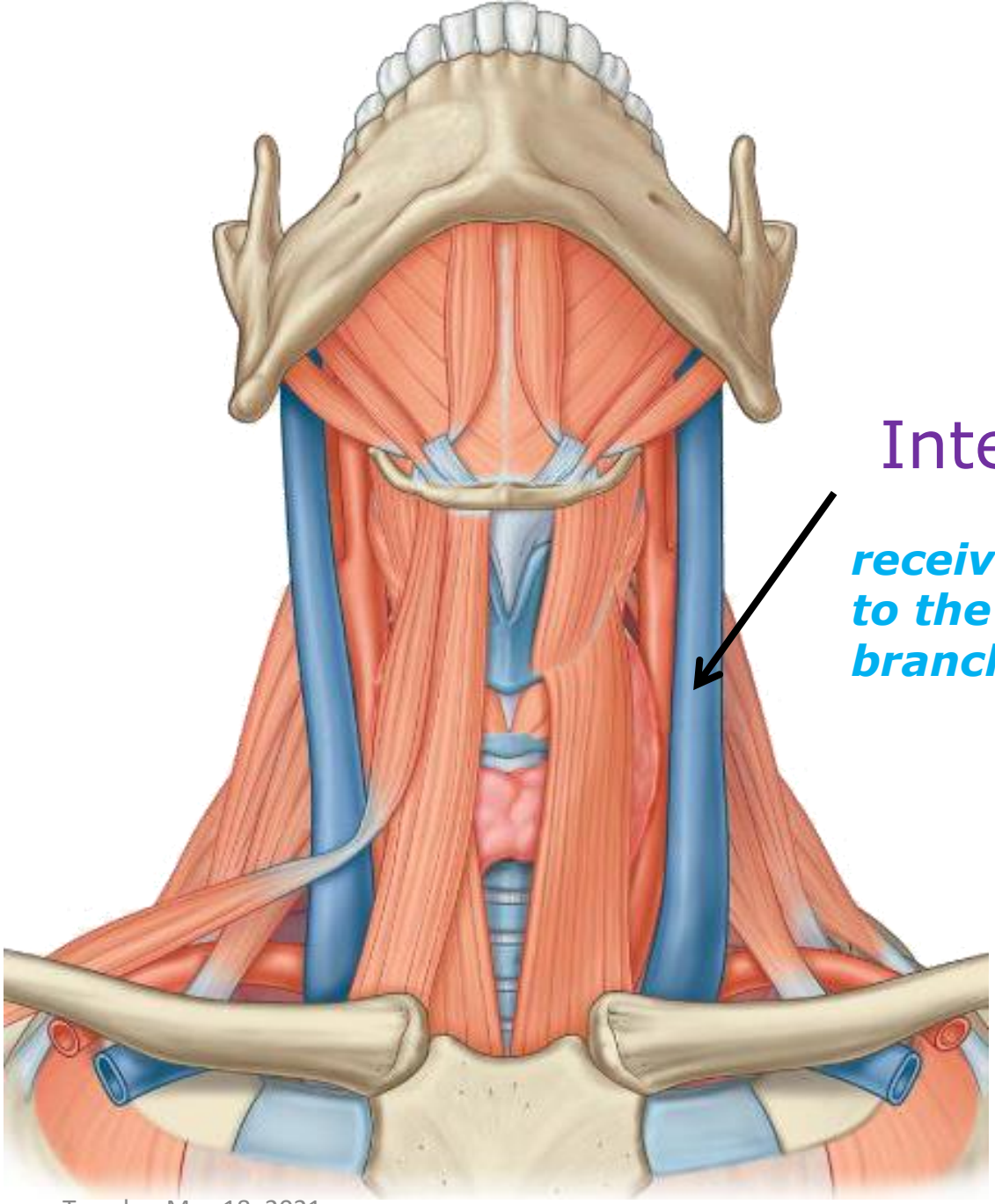
***Carotid sheath*:**

**with its vascular and nervous contents.**

***Lymph Nodes:***

- **Deep cervical lymph nodes**
- **situated along the IJV.**





# Internal Jugular Vein

***receiving 4 veins corresponding to the previously mentioned branches of ECA***

# Nerves

**Within the carotid sheath**

3 cranial ns

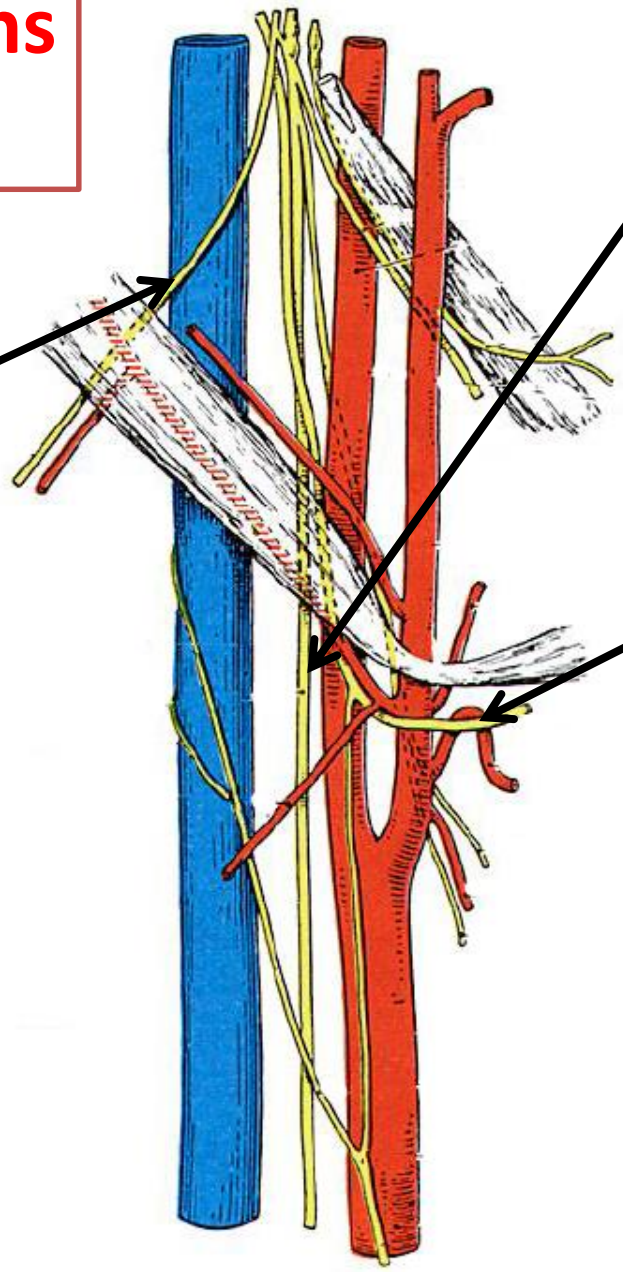
**Anterior to the carotid sheath**

Ansa cervicalis

**Posterior to the carotid sheath**

Sympathetic ch.

# Last 3 cranial ns
# X , XI, XII.

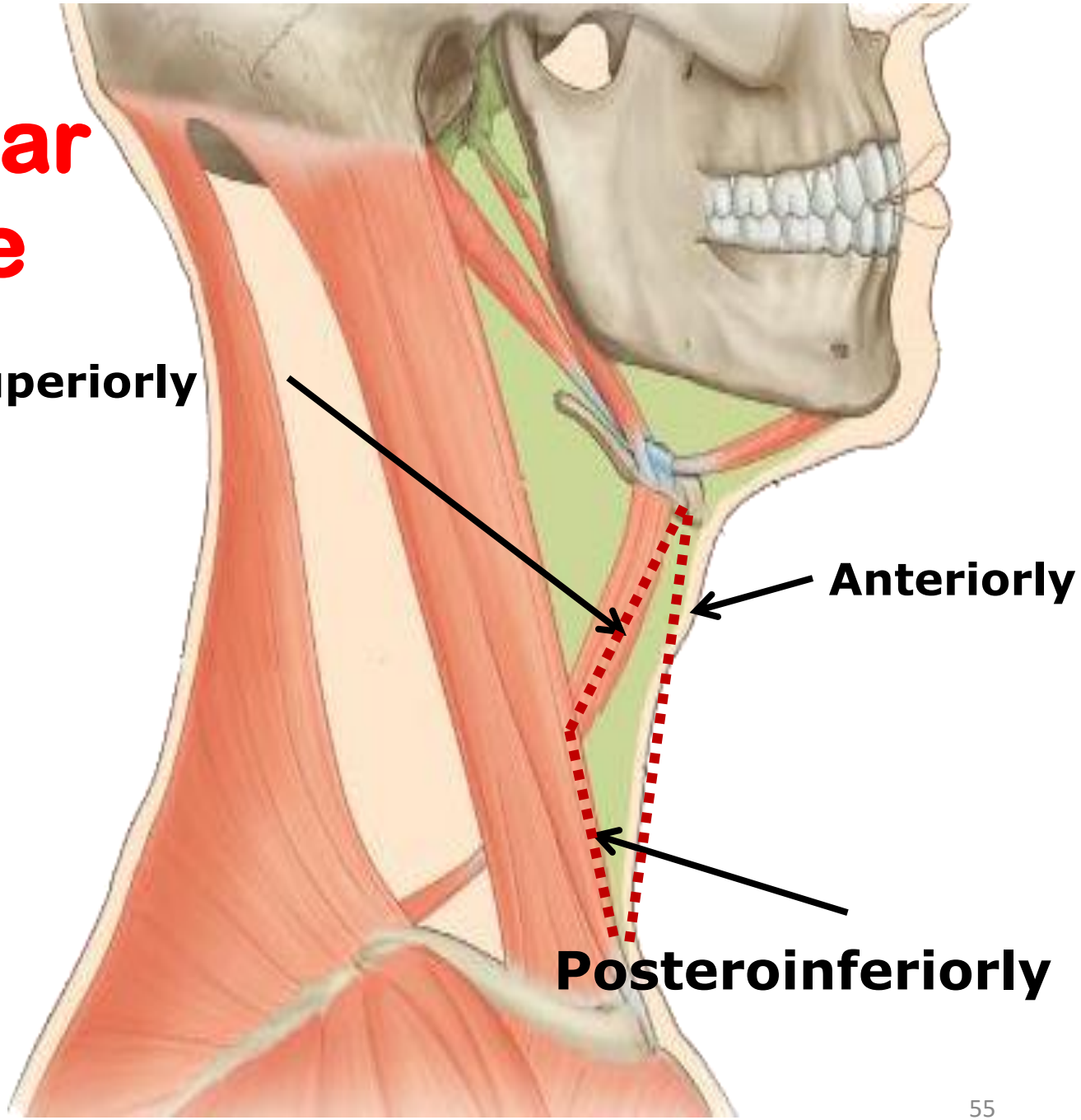


•Accessory n.

•Vagus n.

•Hypoglossal n.

# 4-Muscular Triangle



# *Boundaries of the muscular Triangle :

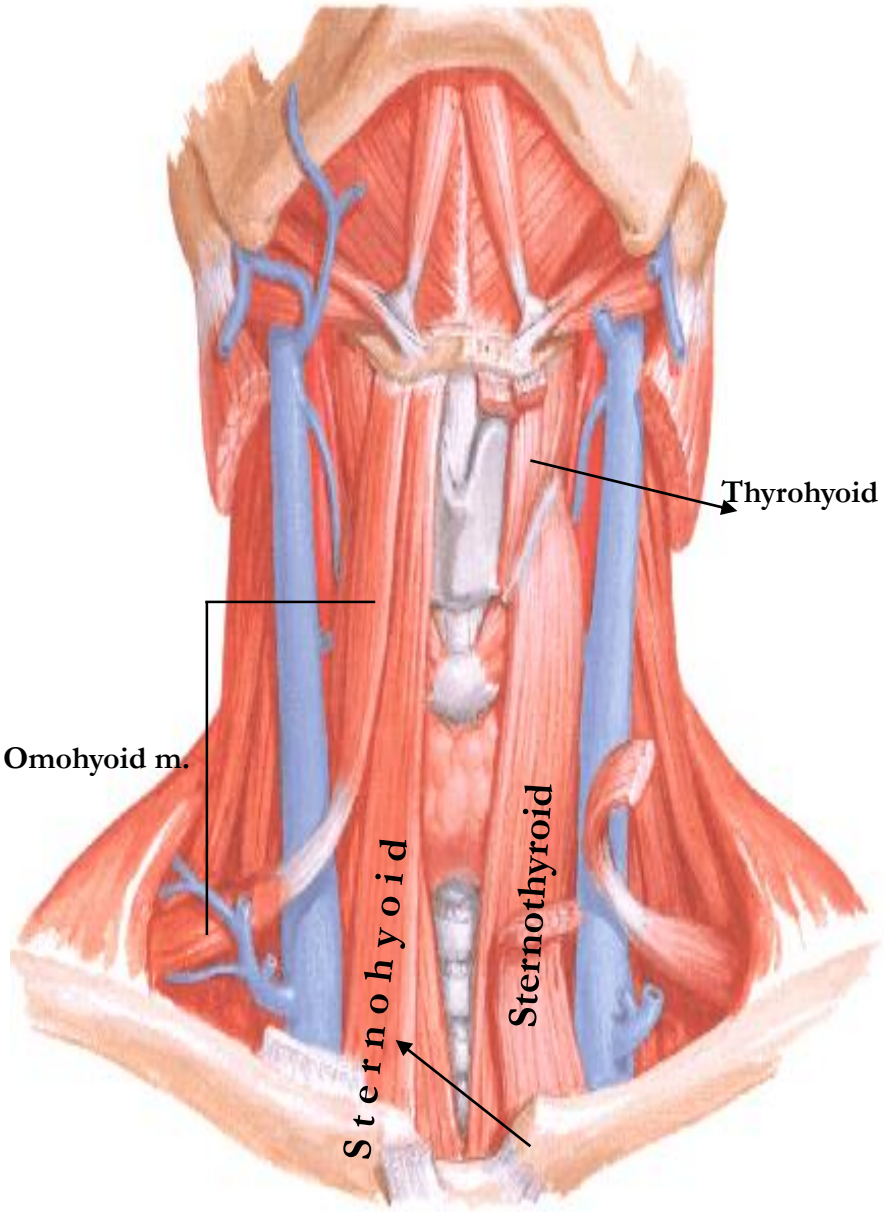
-**Anteriorly**: median line of neck.

**-Postero-superiorly:** Superior belly of omohyoid.

**-Postero-inferiorly**: Anterior border of sternomastoid.

***-Roof:*** -Skin, superficial fascia & investing deep cervical fascia.

***-Floor:*** Pre-tracheal fascia.




***Contents:*** ***The infrahyoid muscles***

# 4-contents of muscular triangle:

## The infrahyoid muscles

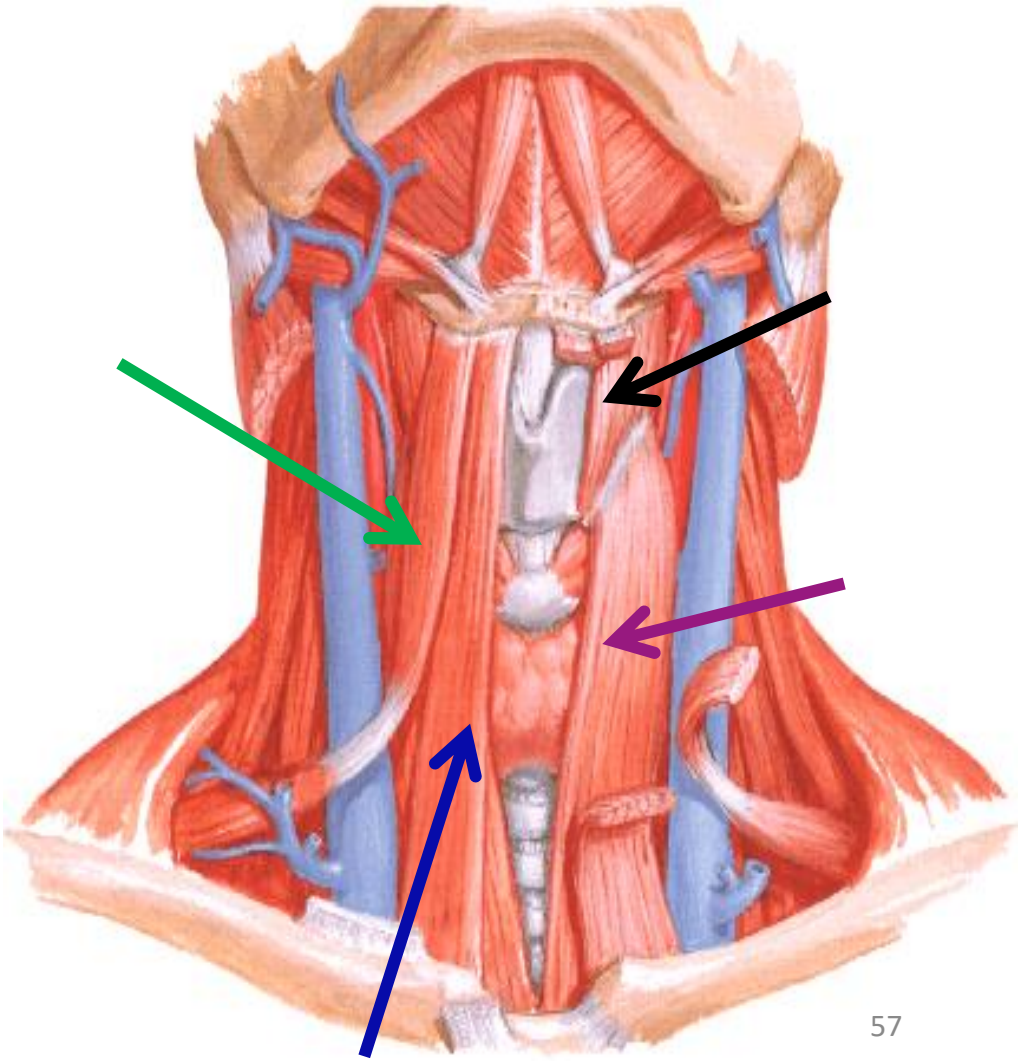
- Lie under hyoid bone
- Arranged into 2 layers:

**Superficial**

1. sternohyoid
2. omohyoid

**Deep**

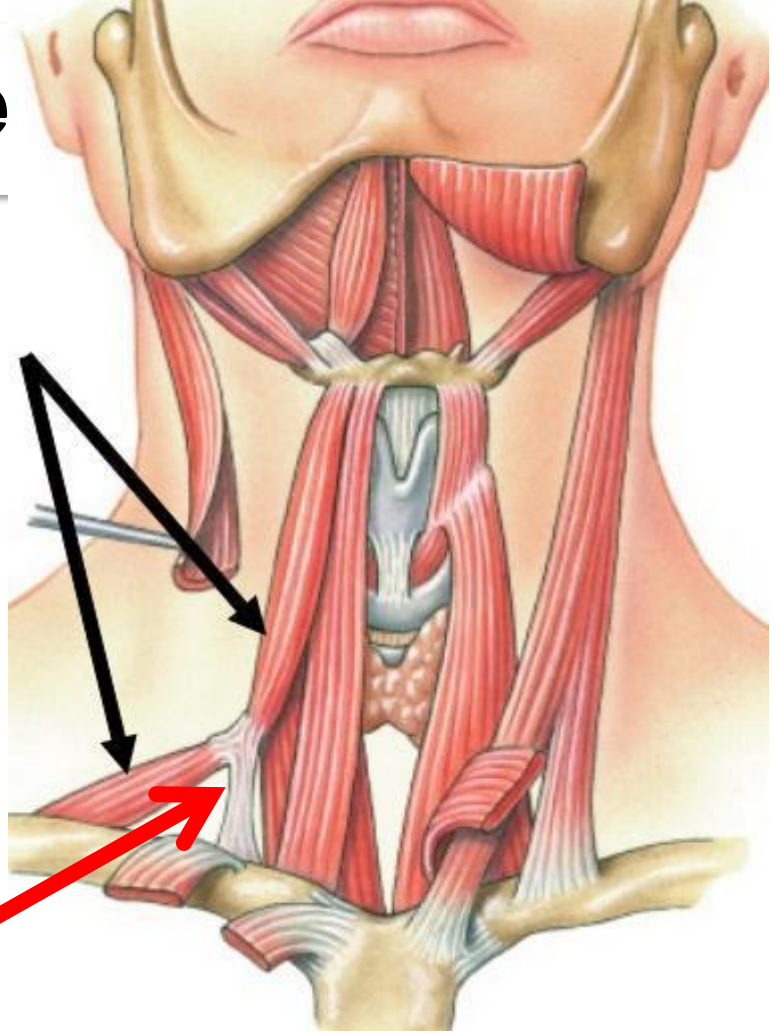
1. sternothyroid
2. thyrohyoid



- All infrahyoid muscles are supplied by ansa cervicalis C1,2,3, except thyrohyoid which is supplied directly by C1 joining hypoglossal n
- All infrahyoid muscles depress the hyoid bone ONLY except the Thyrohyoid CAN elevate larynx also.

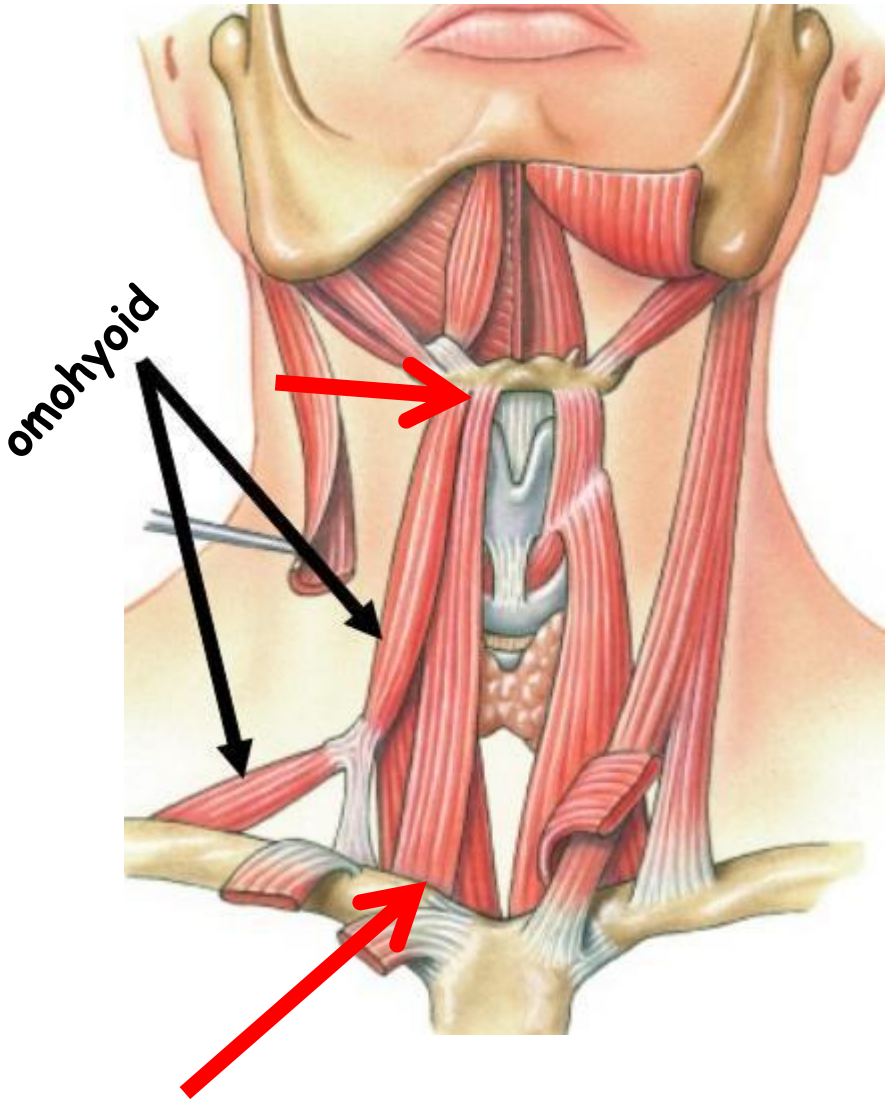
# 1-Omohyoid muscle

- Has 2 bellies: superior & inferior
- Origin of superior belly from hyoid bone
- Origin of inferior belly from scapula
- Insertion→ both bellies join an intermediate tendon kept in position by a fibrous loop connecting it to clavicle



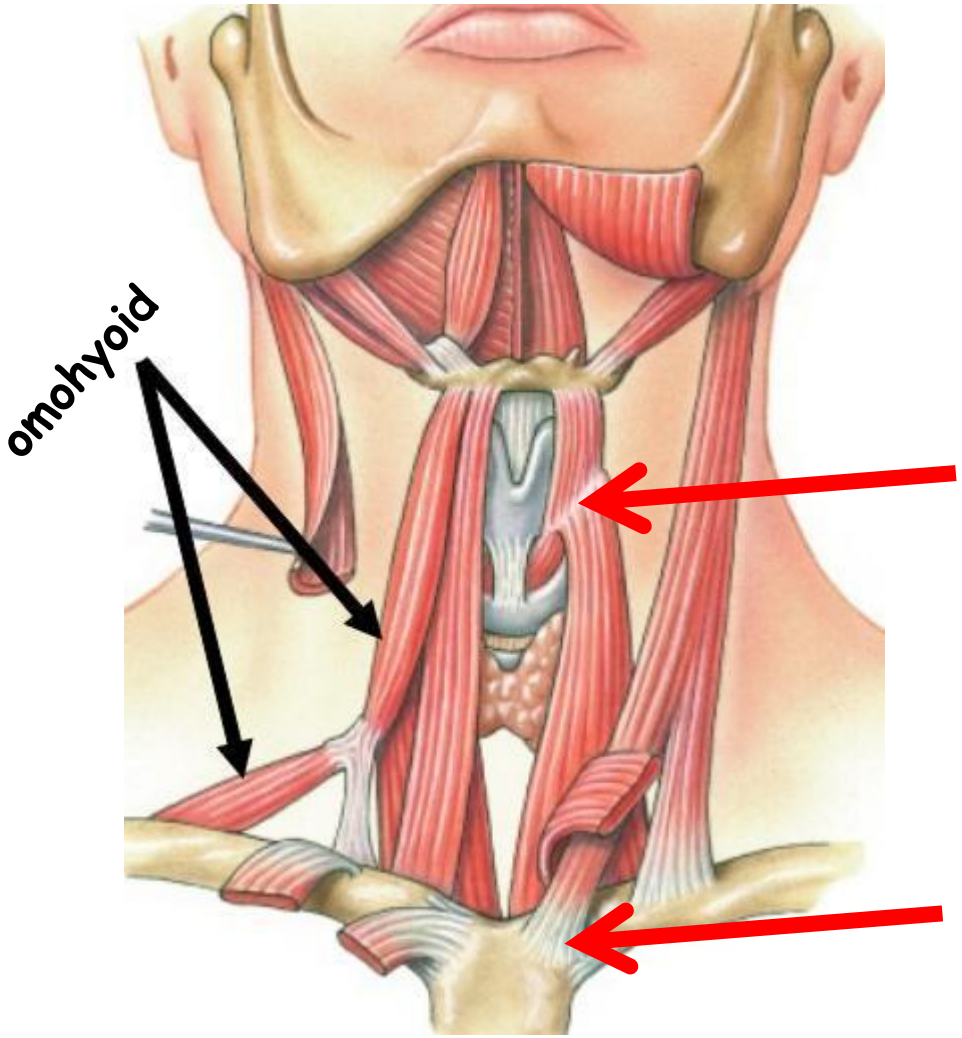
# 2-Sternohyoid muscle

Arise from the posterior surface of manubrium sterni to the lower border of hyoid bone



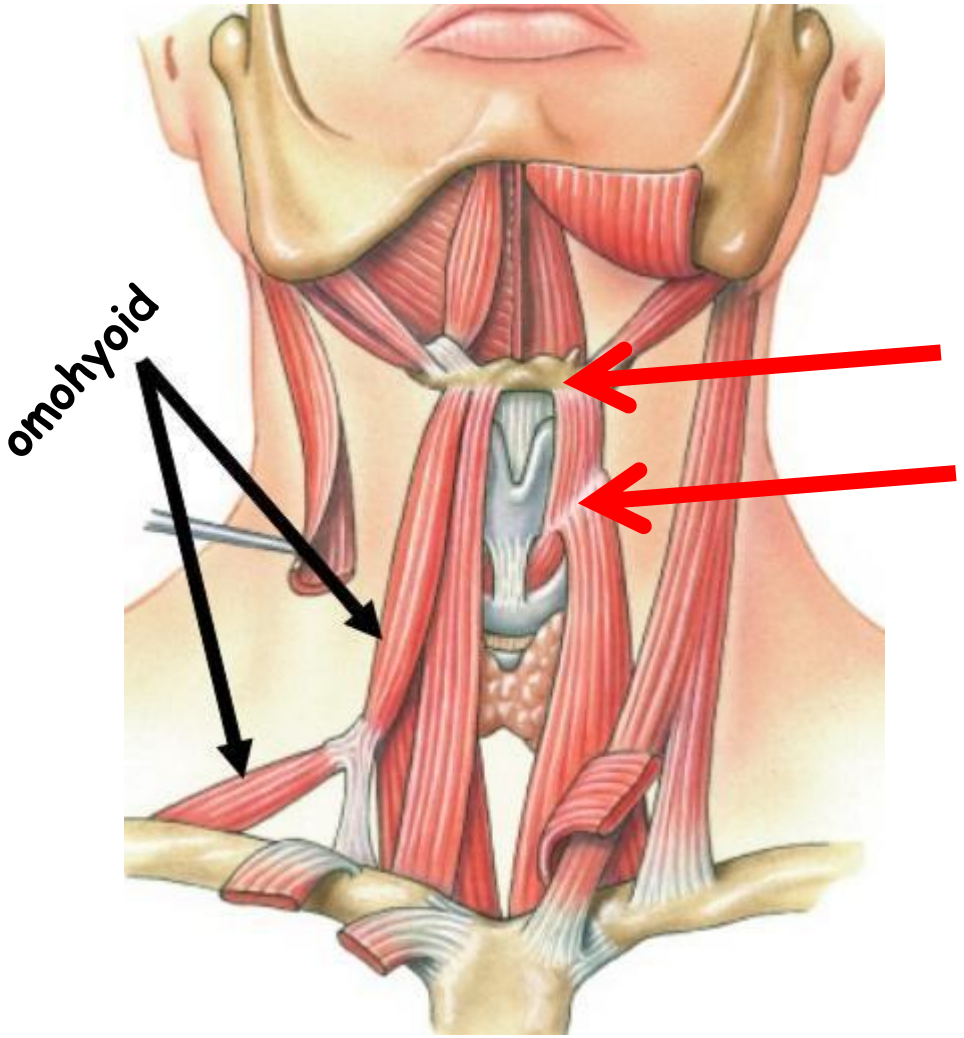
# 3-Sternothyroid muscle

**Arise from the manubrium sterni to thyroid cartilage**



# 4-Thyrohyoid muscle

**Arise thyroid cartilage to the hyoid bone**



- Which muscles must be retracted to gain access to the thyroid gland during its removal?
- a. Longus coli, longus capitus, and anterior scalene muscles
- b. Mylohyoid, anterior belly of the digastrics, genioglossus, and geniohyoid muscles
- c. Platysma, sternohyoid, sternothyroid, and omohyoid muscles
- d. Superior, middle, and inferior pharyngeal constrictors
- e. Trapezius, rhomboids, and levator scapulae muscles

# Thank you