

Blood Vessels of head and neck

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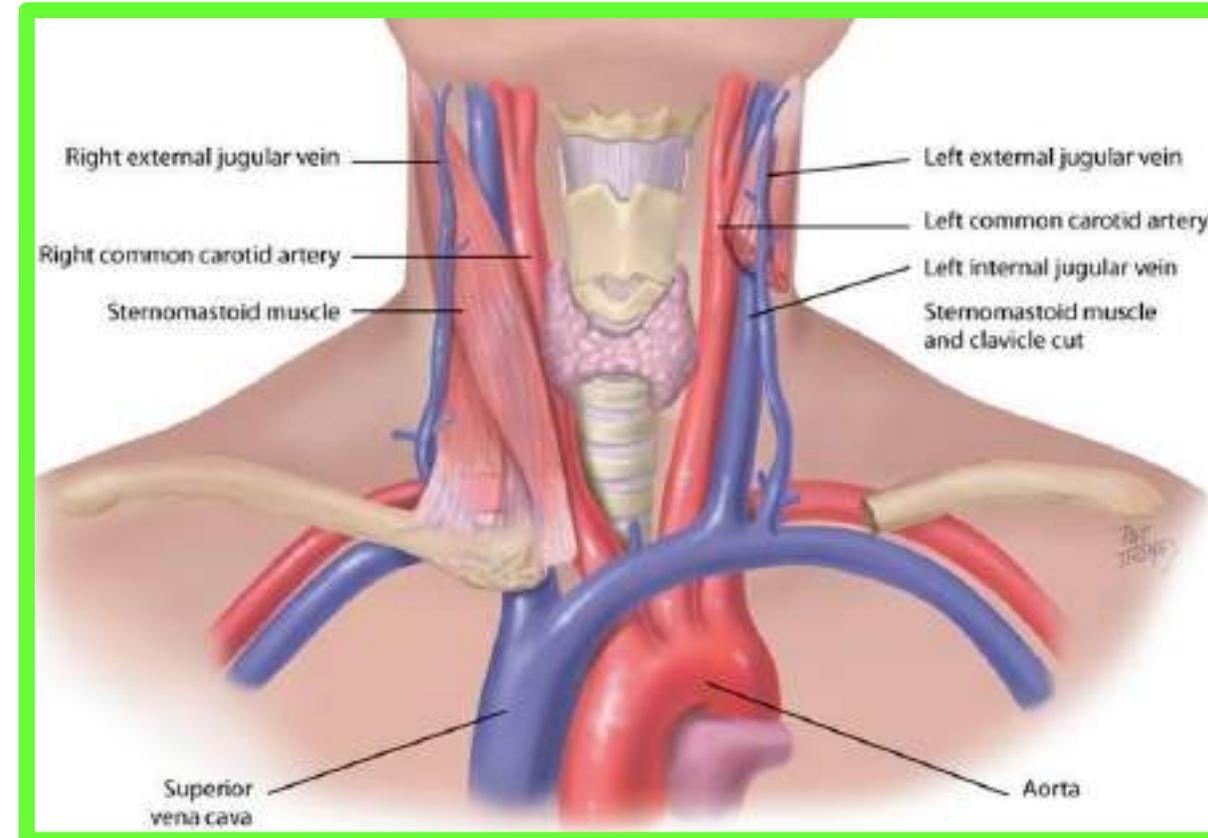
College of Medicine / University of Mutah

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❑ The brachiocephalic trunk

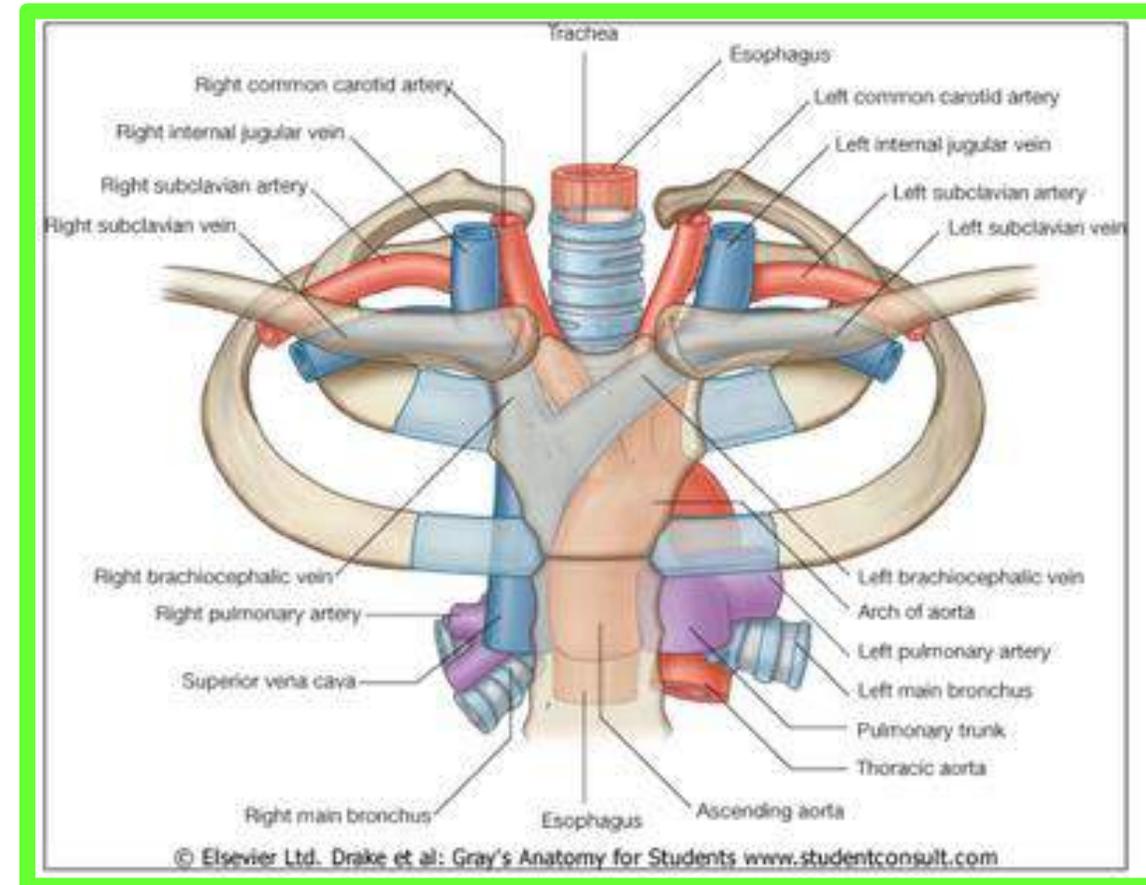
- ✓ Covered anteriorly by **the sternohyoid and sternothyroid muscles**,
- ✓ Is the largest branch of the arch of the aorta.
- ✓ It **arises in the midline, posterior to the manubrium**,
- ✓ Passes superolaterally to the right.
- ✓ It divides into the **right common carotid** and **right subclavian arteries** posterior to the **right sternoclavicular (SC) joint**



The subclavian artery

- ❖ supply the upper limbs
- ❖ Send branches to the **neck** and **brain**.
- ❖ **The right subclavian artery** arises from the **brachiocephalic trunk**
- ❖ **The left subclavian artery** arises from the **arch of the aorta**

❖ Their courses in the neck begin posterior to the respective **SC joints** as they ascend through **the superior thoracic aperture**.



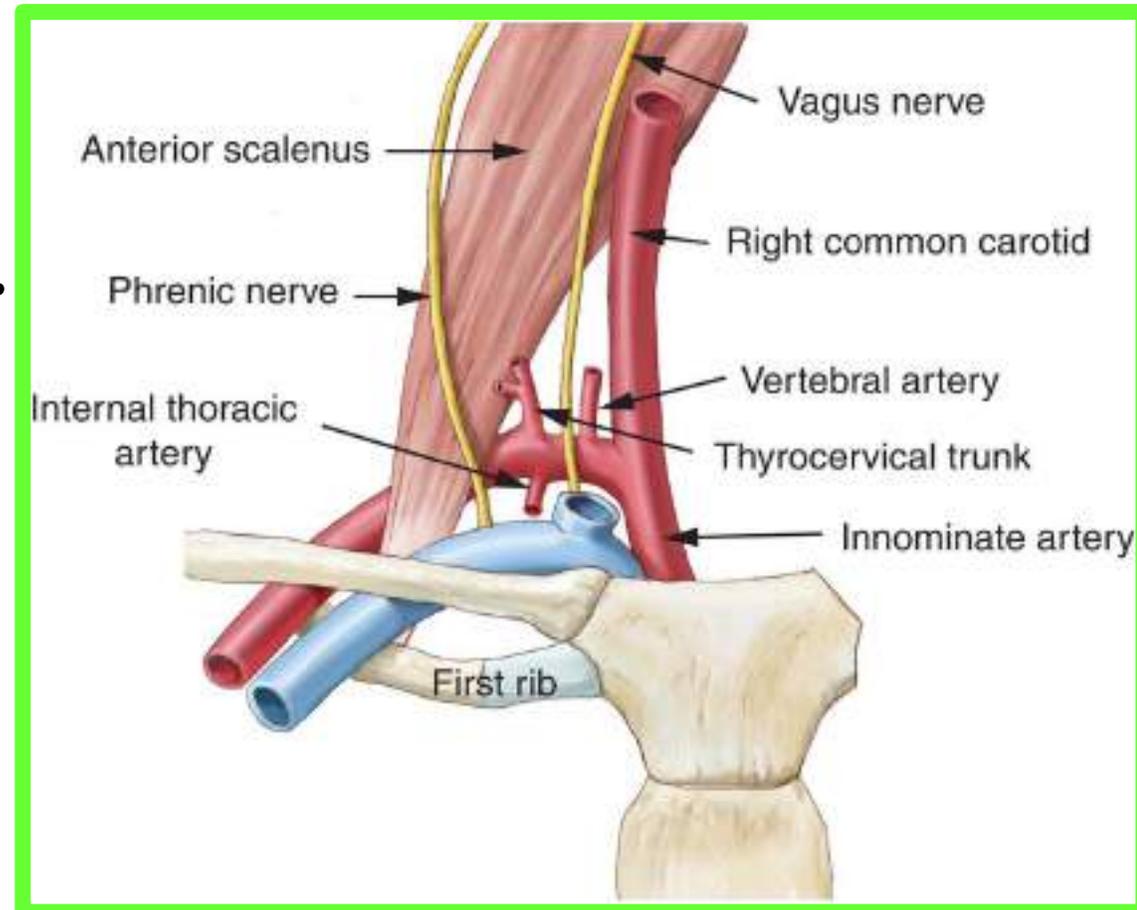
The subclavian artery

✓ **The arteries** arch superolaterally, extending between their origin and the medial margin of the anterior scalene muscle.

✓ As the arteries begin to descend, they travel

- ❖ deep to the middle of the clavicles
- ❖ cross the superior surface of the 1st rib.

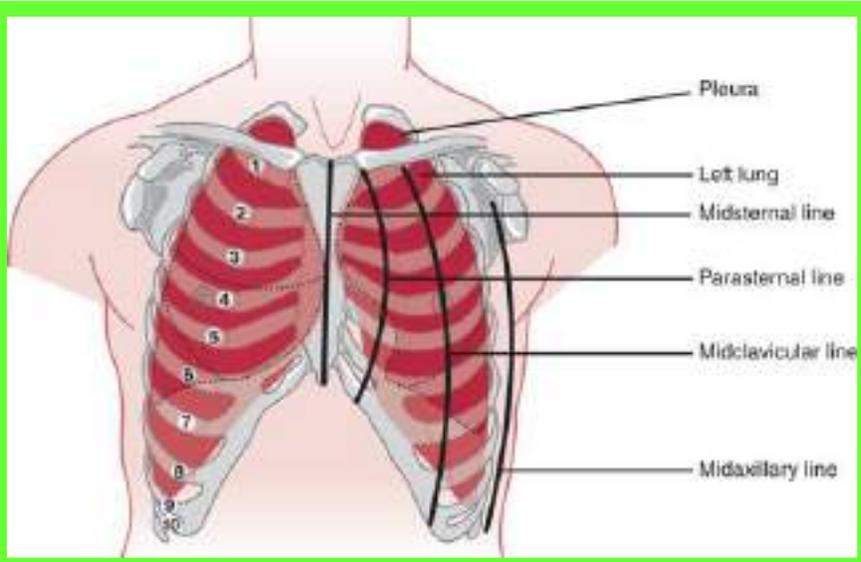
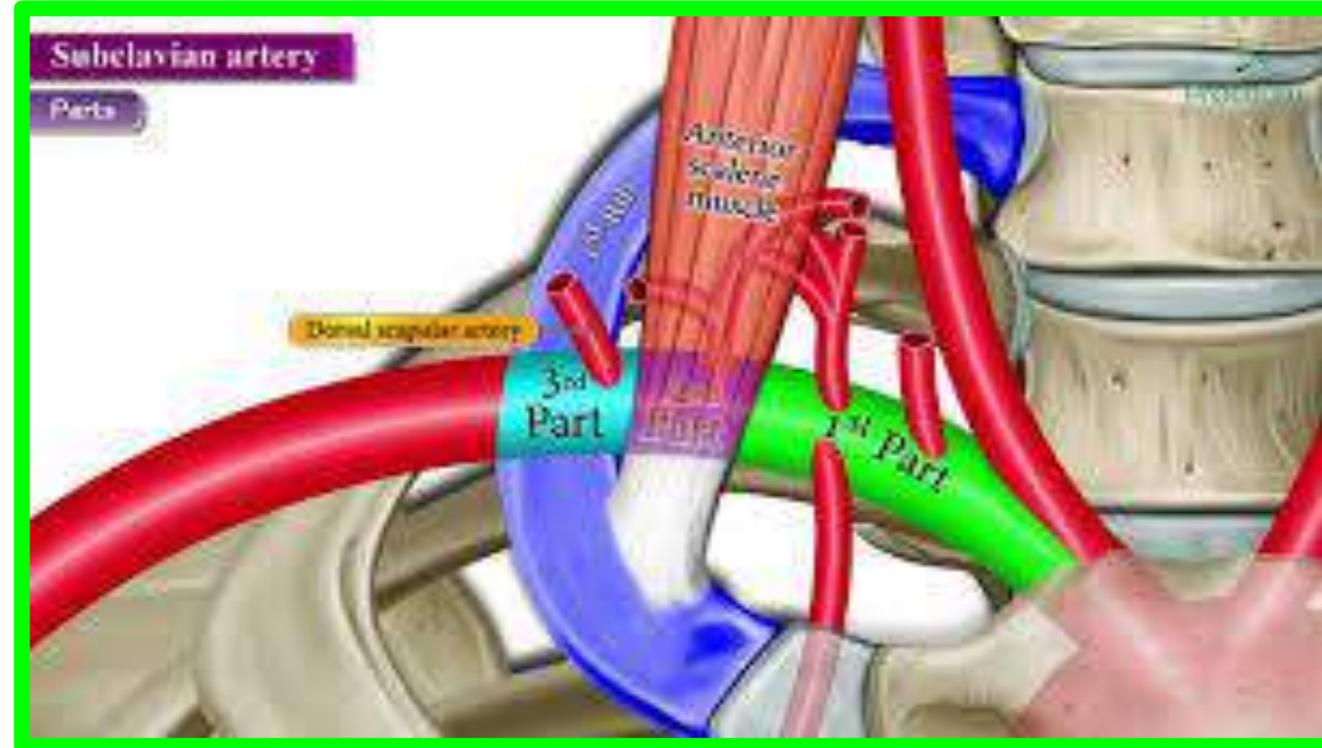
✓ At the **outer margin of the 1st rib**, their name changes to **the axillary arteries**.



The subclavian artery

□ For purposes of description, **the anterior scalene muscle** divides each **subclavian artery** into three parts:

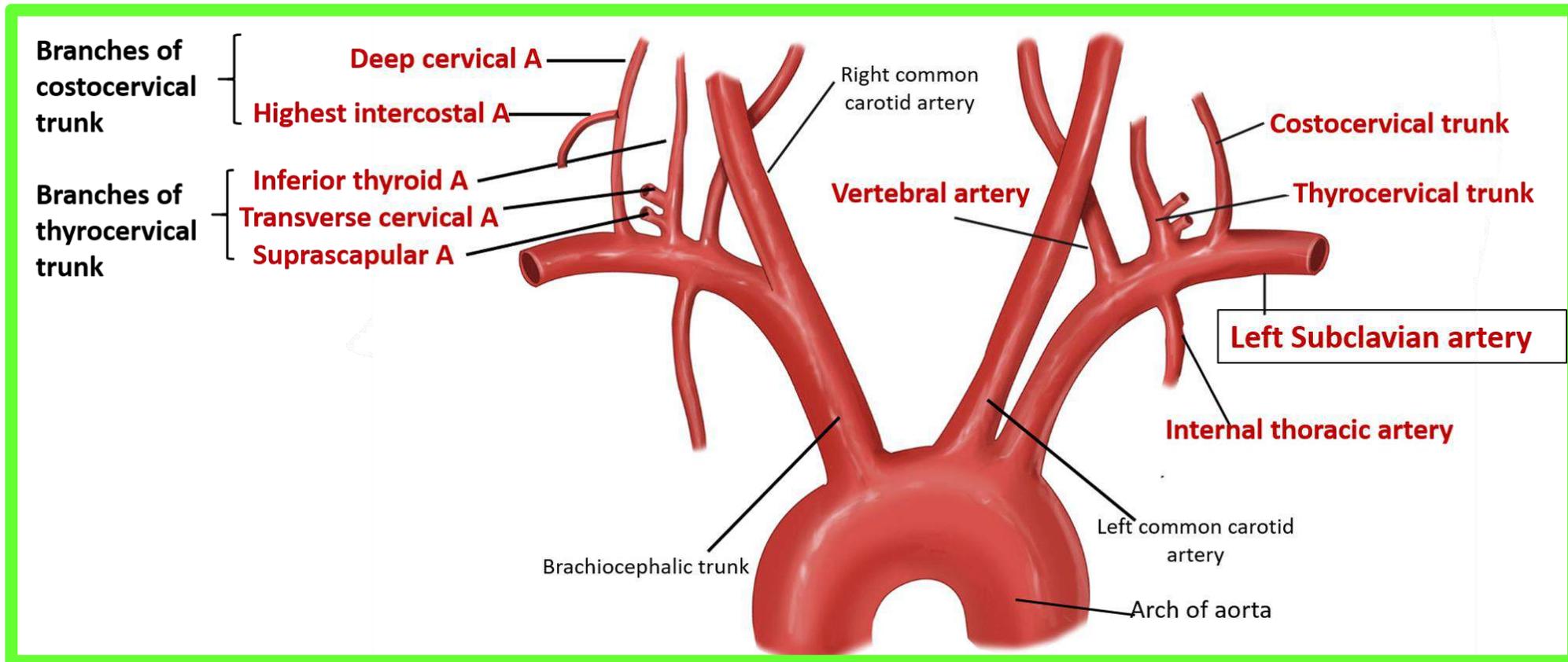
- the first part is medial to the muscle,
- the second is posterior to it, and
- the third is lateral to it.



The cervical pleurae, covering the apices of the lungs, and sympathetic trunk lie posterior to the arteries

The branches of the subclavian artery are the:

- **Vertebral artery, internal thoracic artery, and thyrocervical trunk** from the first part of the subclavian artery
- **Costocervical trunk** from the second part of the subclavian artery
- **Dorsal scapular artery**, often arising from the third part of the subclavian a.



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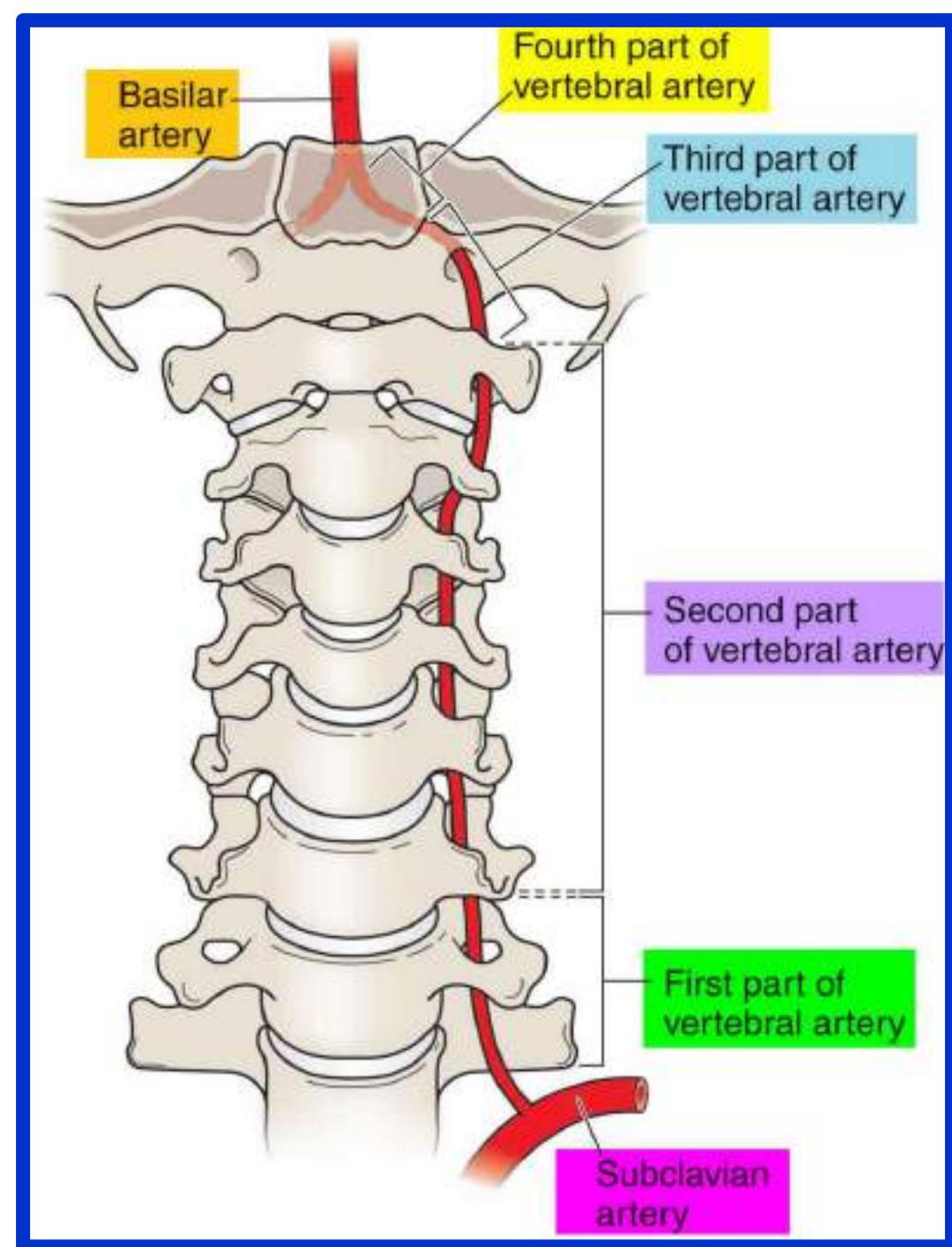
VERTEBRAL ARTERY

- **Origin:** arises from the **1st part of subclavian artery.**

- **Course :** its course is divided into 4 parts:

1. 1st part: from its origin to the transverse process of C6

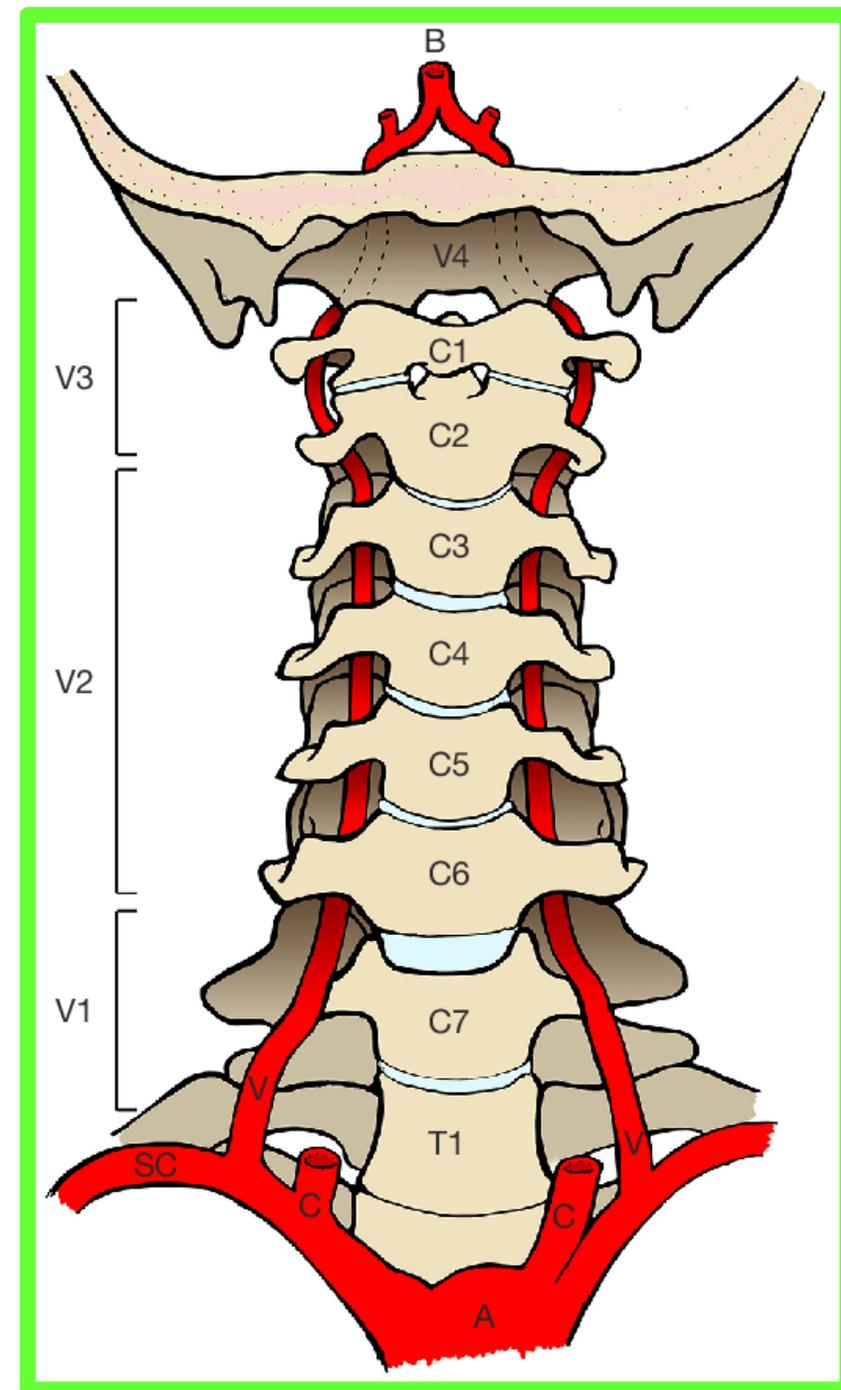
2. 2nd part: ascends in the foramina transversaria of the upper 6 cervical vertebrae.



VERTEBRAL ARTERY

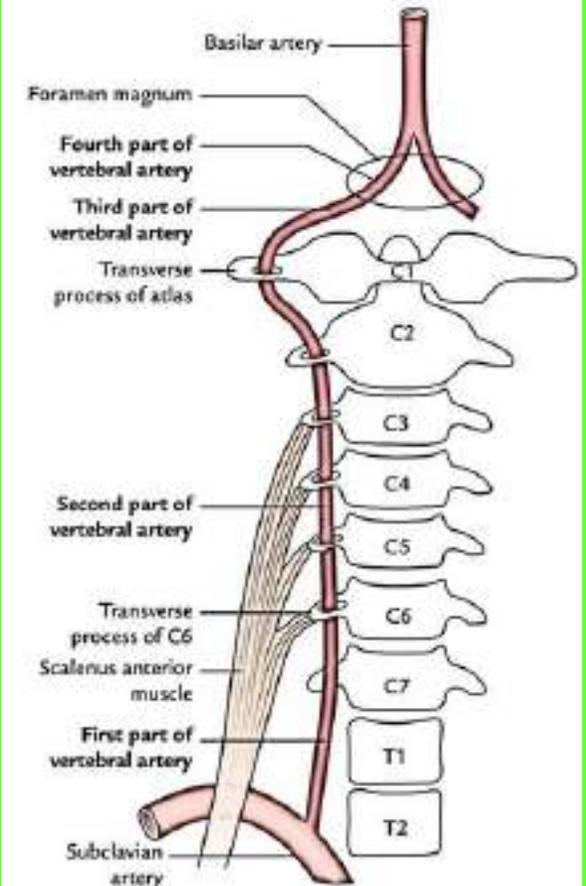
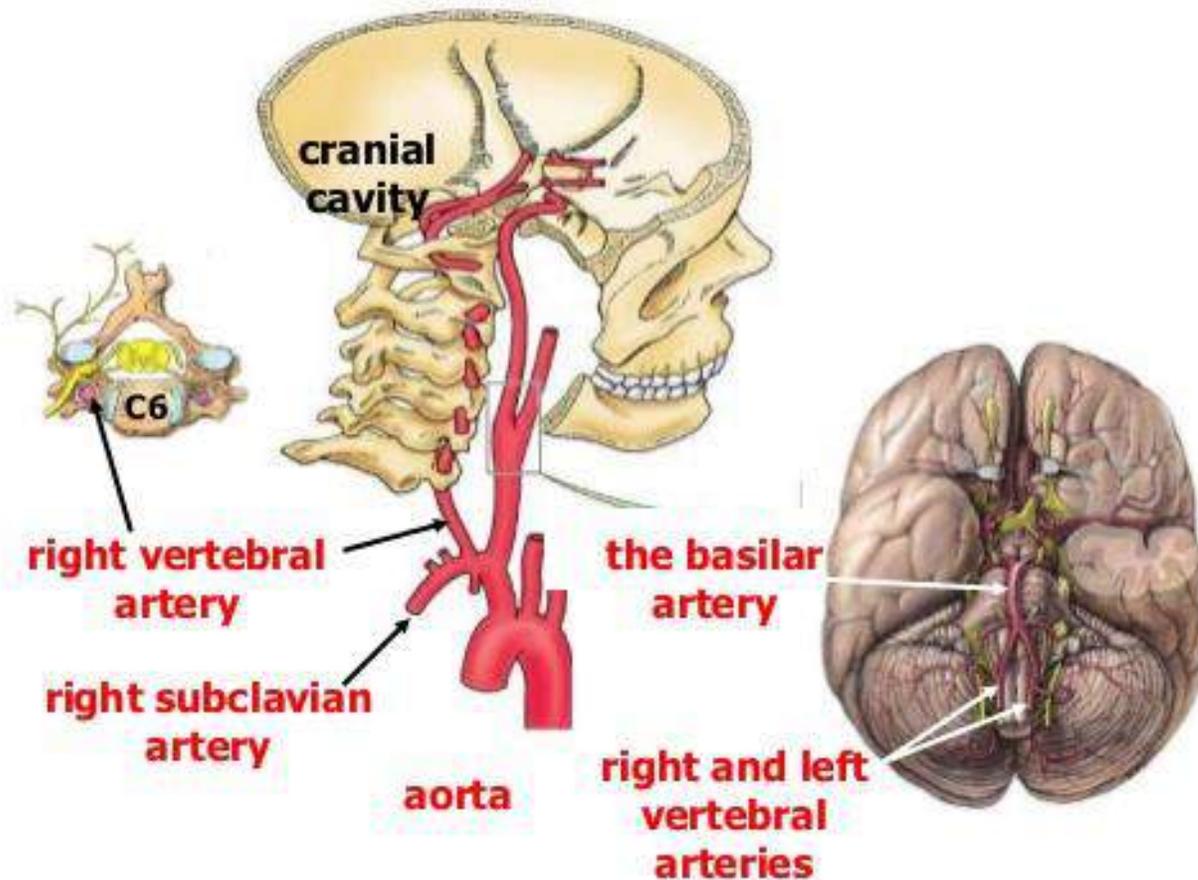
3. 3rd part: lies in the suboccipital triangle:

- ✓ It leaves **foramen transversarium of the atlas** and curves backwards and medially.
- ✓ It deeply grooves the upper surface of the posterior arch of the atlas.



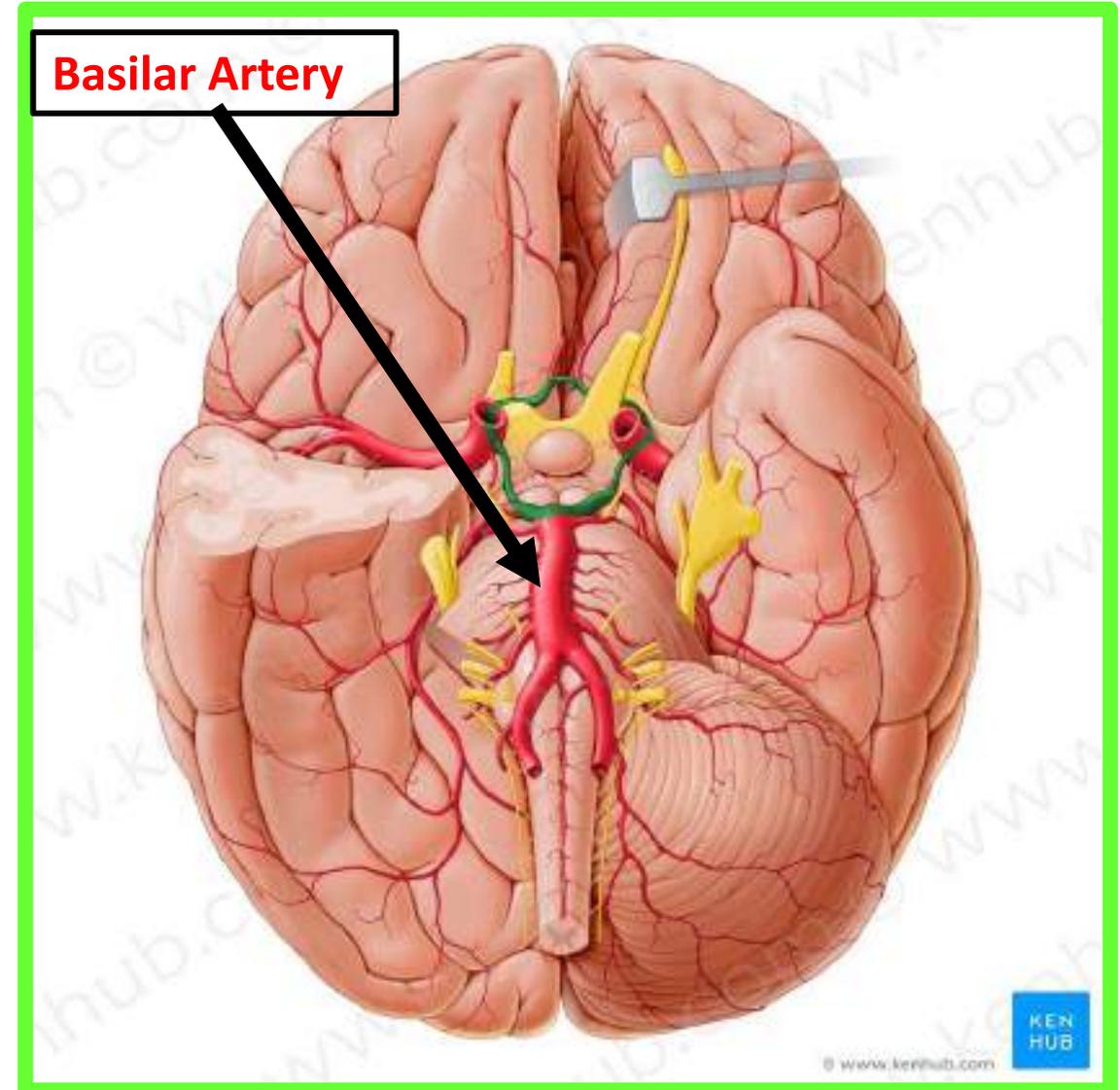
4. 4th part: It pierces the **dura and arachnoid matter** and ascends upward through **foramen magnum** to enter the cranial cavity.

❖ It inclines medially and ascends in **front of the medulla oblongata**.



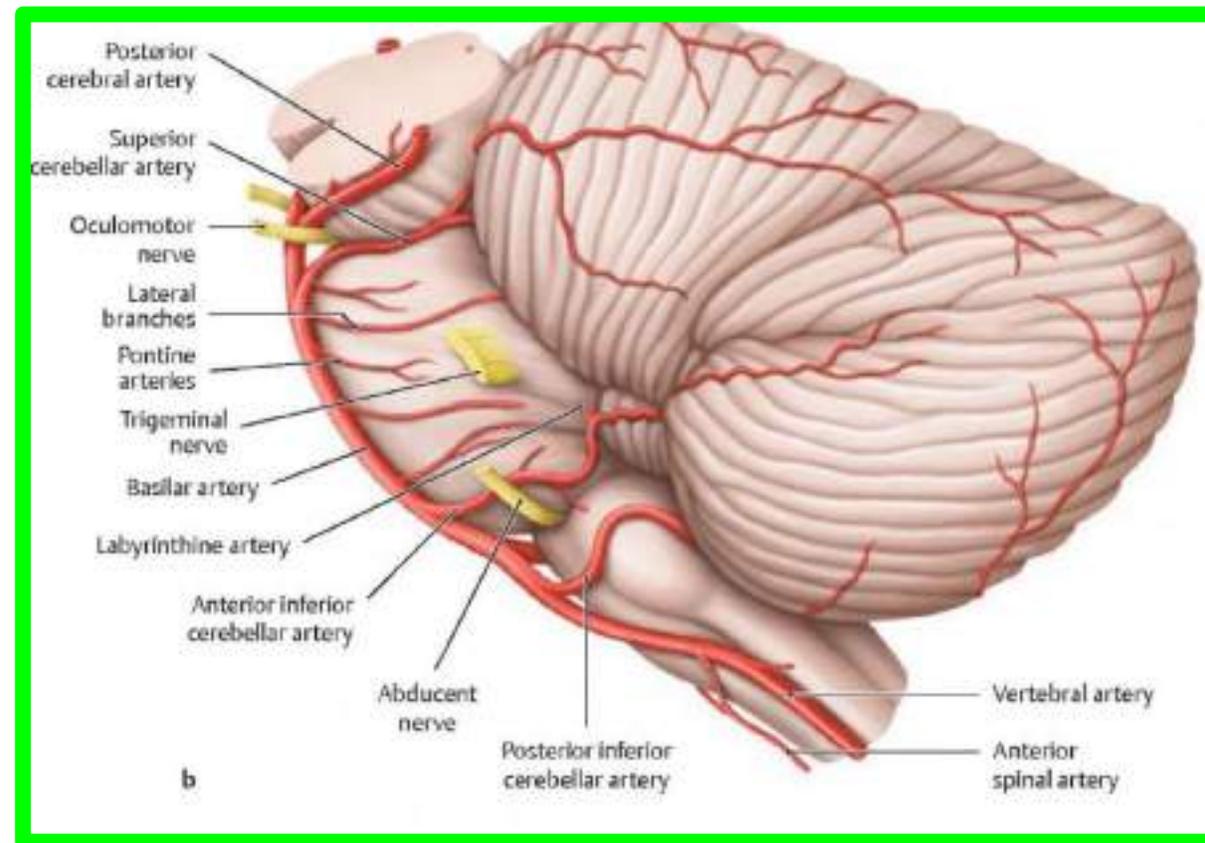
VERTEBRAL ARTERY

- Ends: at the lower border of pons by joining the opposite artery to form basilar artery.



VERTEBRAL ARTERY

- Branches of vertebral artery:
- Branches in the neck (2nd part):
 - Spinal branches to the spinal cord.
 - Muscular branches: to the deep muscles of the neck.
- Branches in the cranial cavity (4th part):
 - Anterior spinal artery.
 - Posterior spinal artery.
 - Medullary branches to medulla oblongata.
 - Posterior inferior cerebellar artery to the cerebellum.

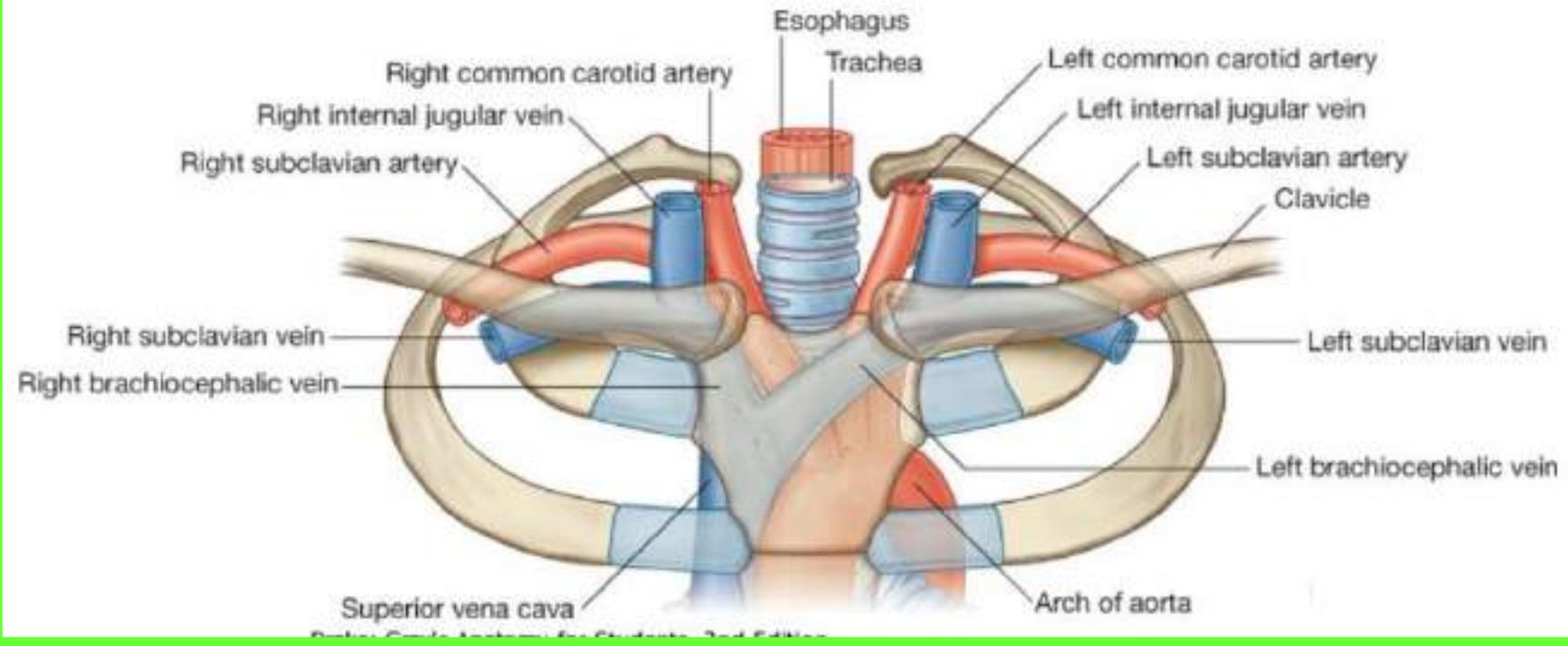
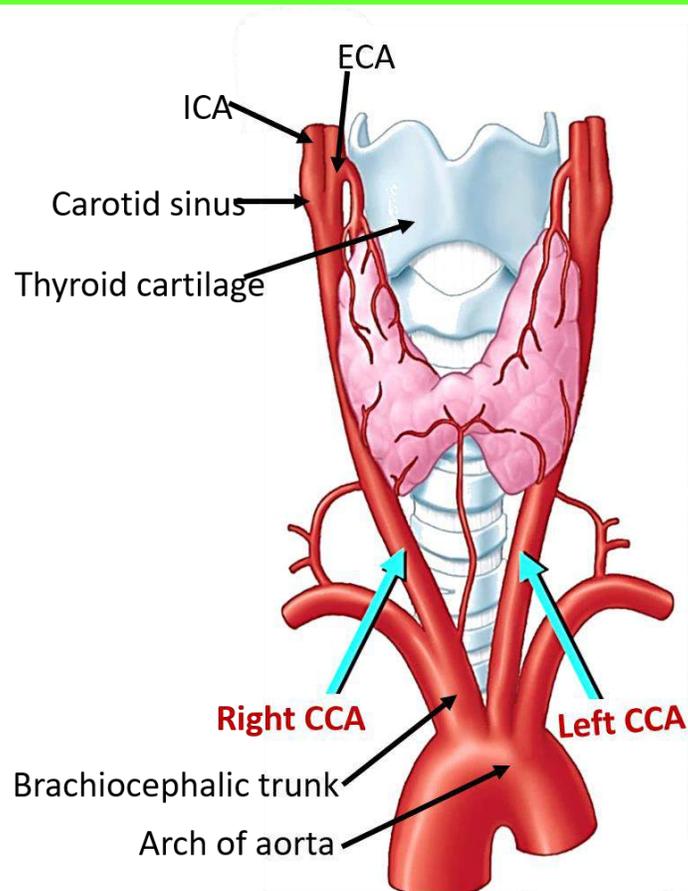


Common Carotid Artery

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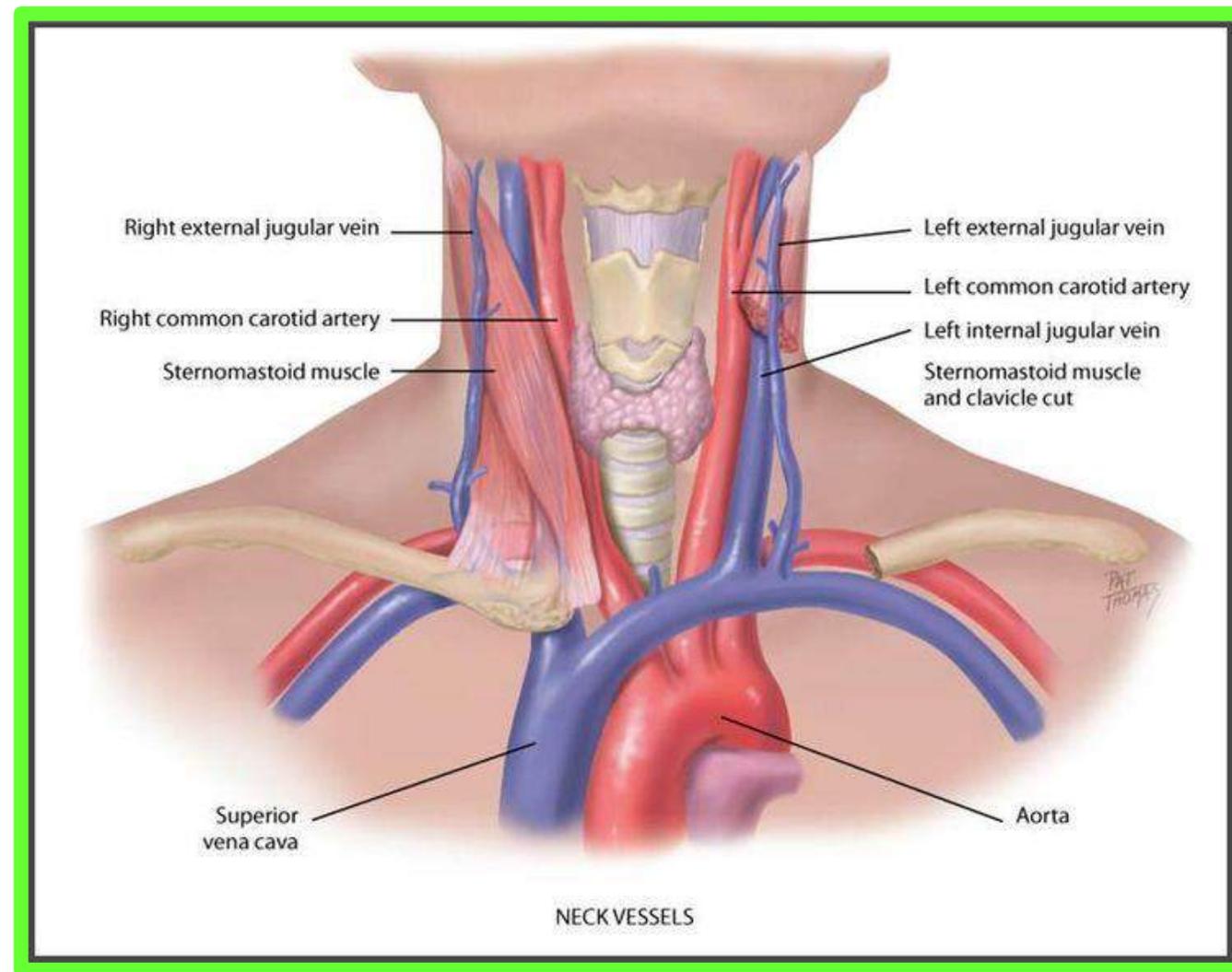
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- ❖ The right common carotid artery arises from the brachiocephalic artery behind the right sternoclavicular joint.
- ❖ The left artery arises from the arch of the aorta in the superior mediastinum.



Common Carotid Artery

❖ runs upward through the neck under cover of the anterior border of the **sternocleidomastoid muscle**, from the sternoclavicular joint to the upper border of the thyroid cartilage.



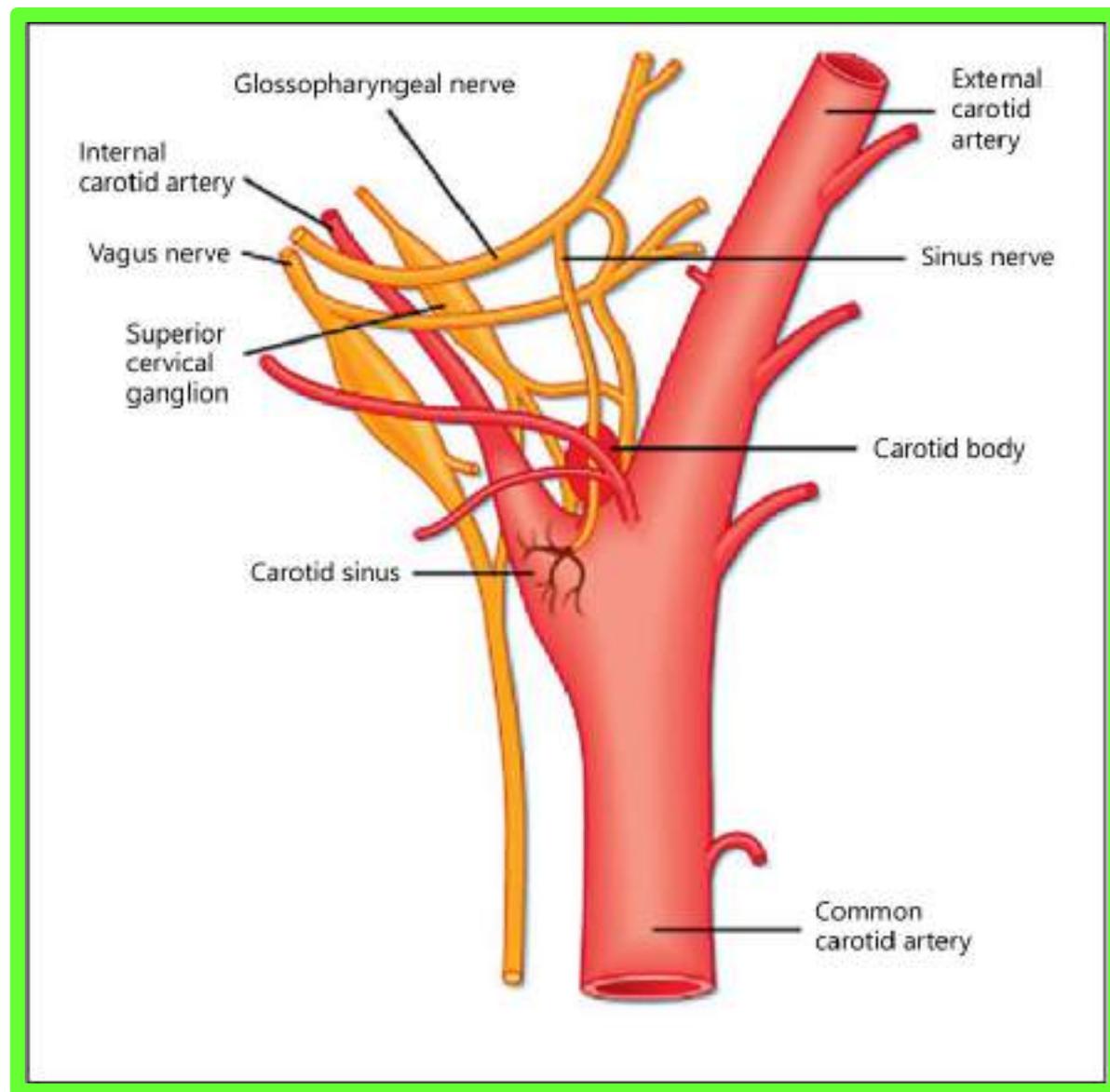
❖ Here, it divides into **the external and internal carotid arteries**

Carotid Sinus

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❖ At its point of division, the terminal part of **the common carotid artery** or the beginning of **the internal carotid artery** shows a localized dilatation, called **the carotid sinus**.

❖ **The tunica adventitia** is relatively thick and contains numerous nerve endings derived from **the glossopharyngeal nerve**.



❖ Serves as a reflex pressoreceptor mechanism: A rise in blood pressure causes a slowing of the heart rate and vasodilatation of the arterioles.

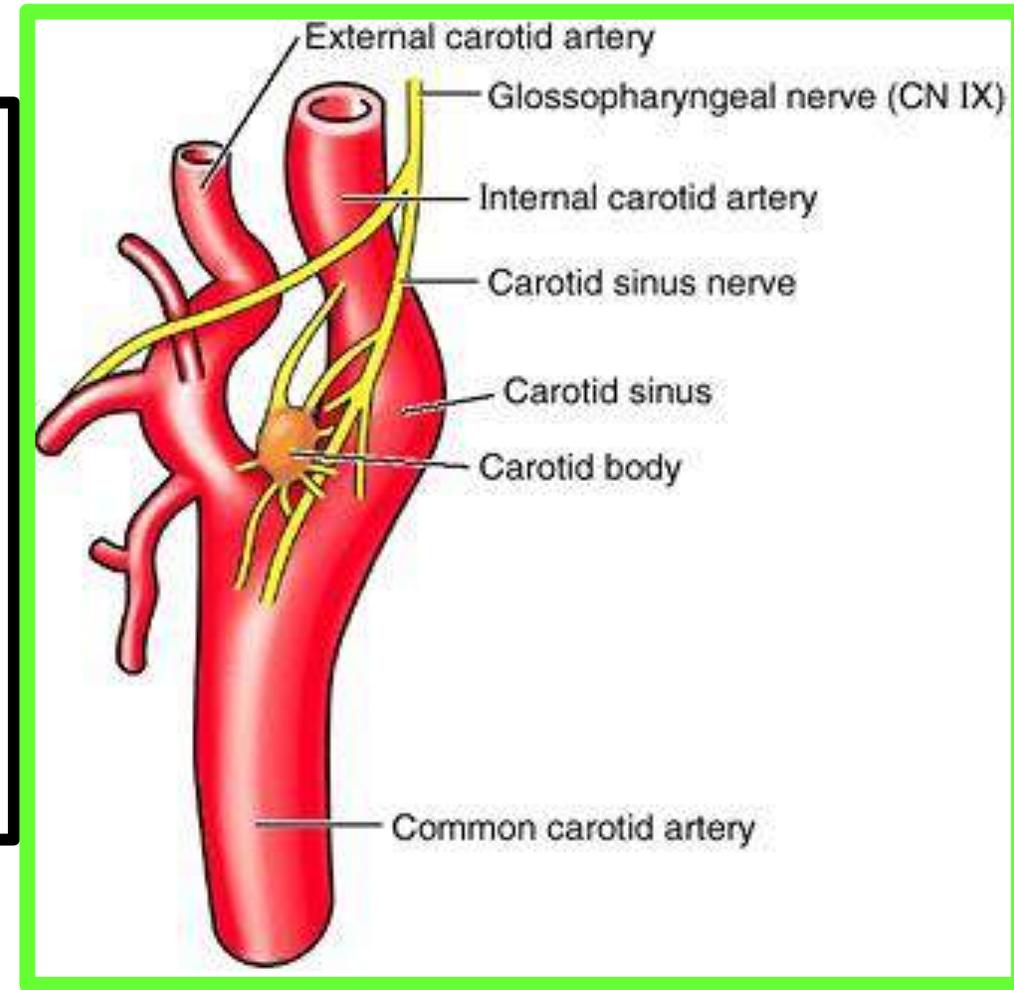
Carotid Body

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- ❖ It is a **small structure** that lies posterior to the point of bifurcation of the common carotid artery.
- ❖ It is innervated by **the glossopharyngeal nerve**.
- ❖ It is a chemoreceptor, being sensitive to excess carbon dioxide and reduced oxygen tension in the blood.

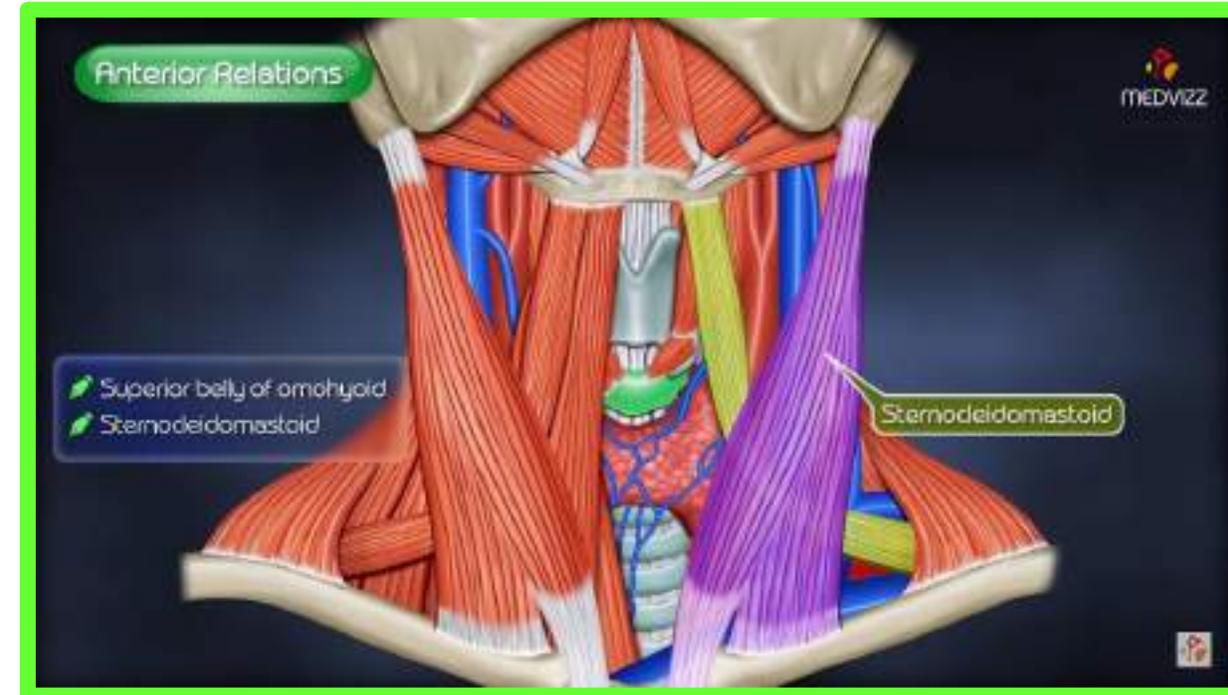
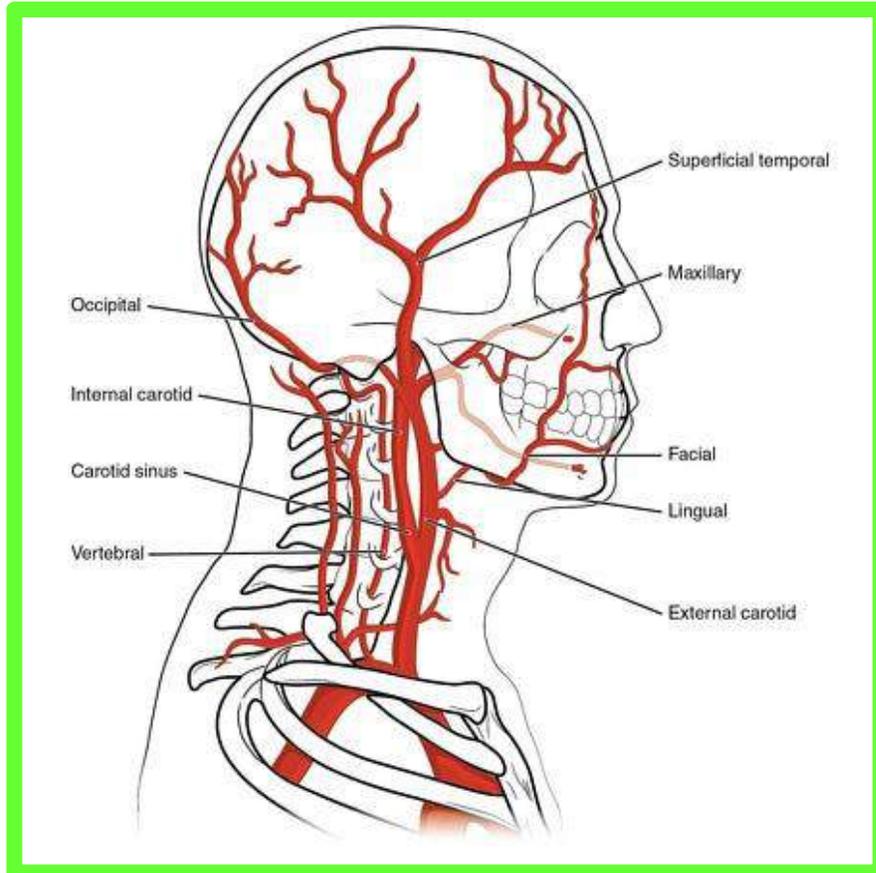


- ❖ **The common carotid artery** is embedded in a connective tissue sheath, called **the carotid sheath**, throughout its course and is closely related to the **internal jugular vein** and **vagus nerve**

Relations of the Common Carotid Artery

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■■ Anterolaterally: The skin, the fascia, the **sternocleidomastoid**, the **sternohyoid**, the **sternothyroid**, and the **superior belly of the omohyoid**



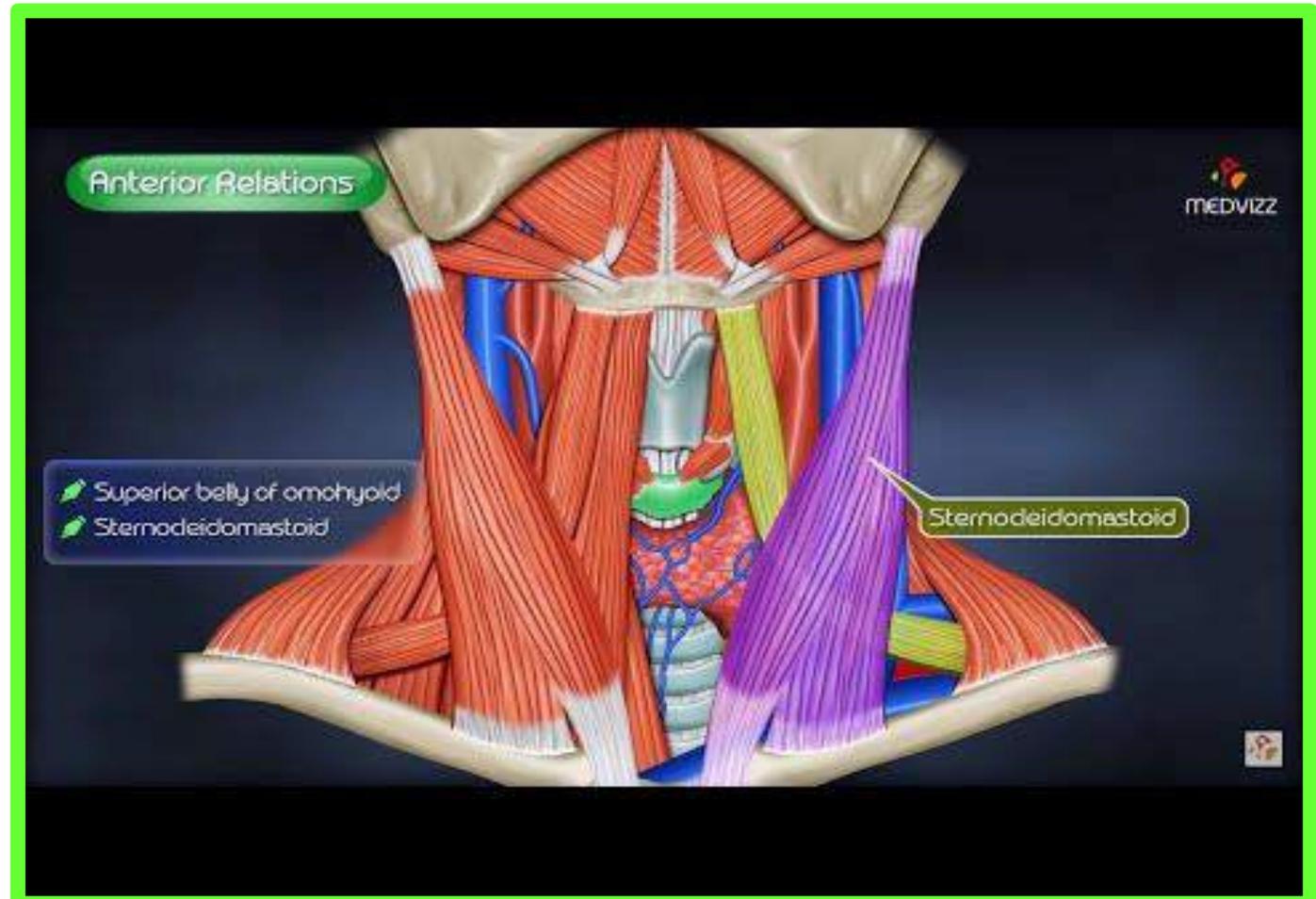
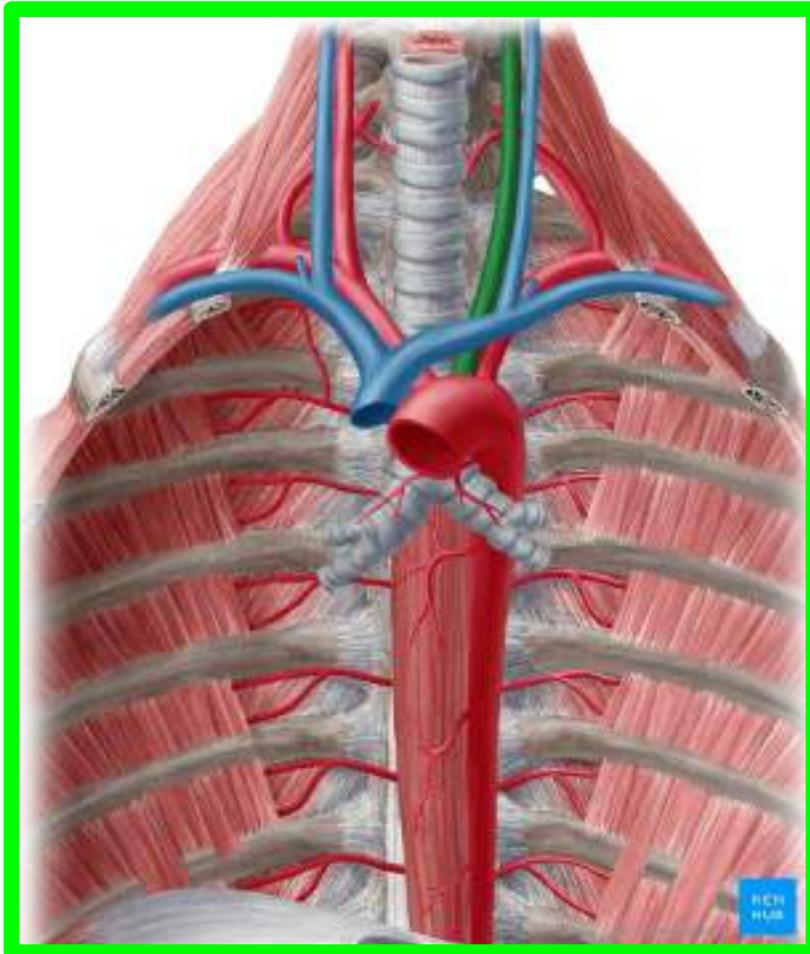
■■ Posteriorly:

- ✓ The transverse processes of the lower 4 cervical vertebrae,
- ✓ prevertebral muscles
- ✓ sympathetic trunk
- ✓ In lower neck are **the vertebral vessels.**

Relations of the Common Carotid Artery

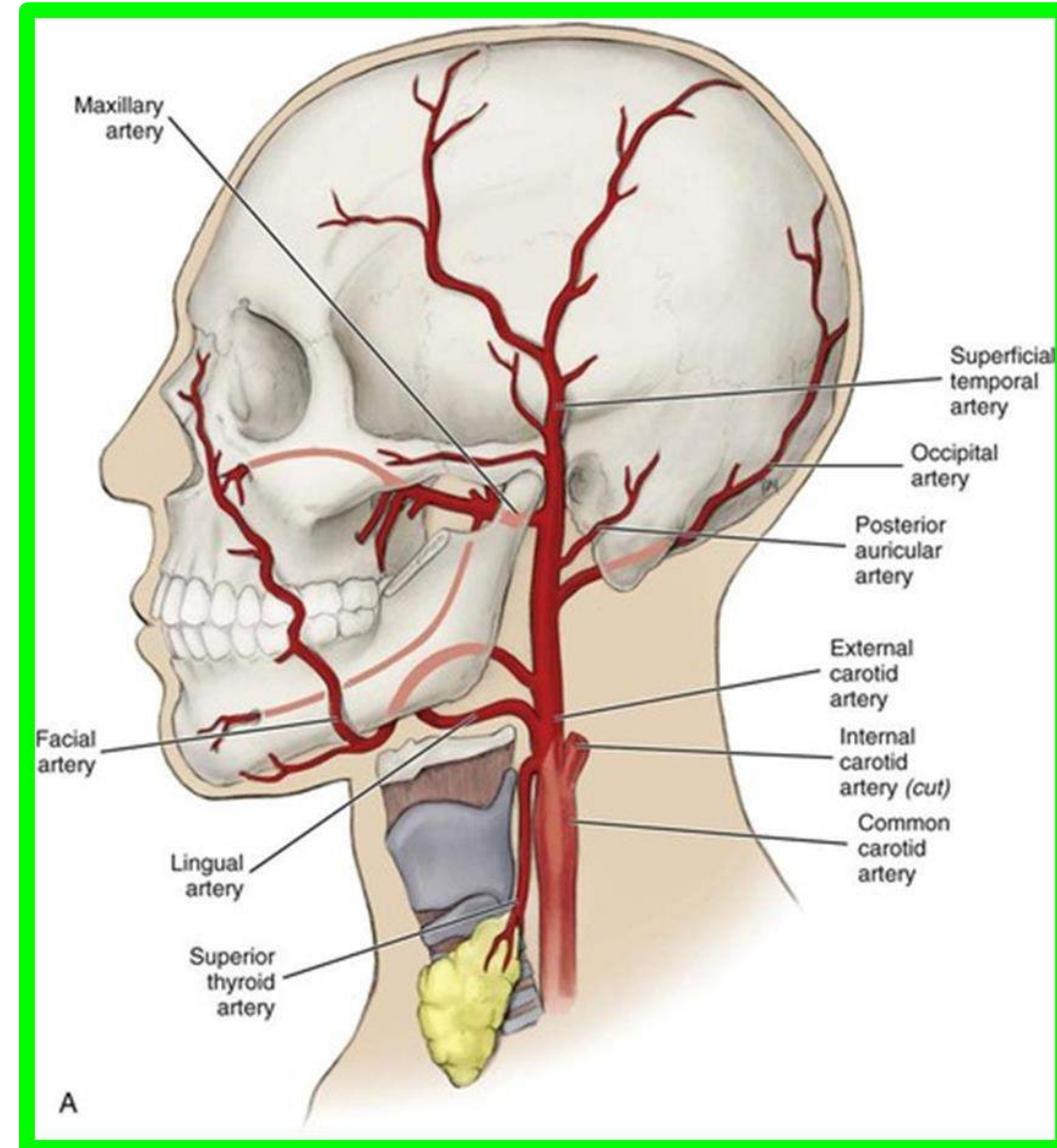
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- Medially: The larynx and pharynx and, below these, the trachea and esophagus. The lobe of the thyroid gland also lies medially.
- Laterally: The internal jugular vein and, posterolaterally, the vagus nerve



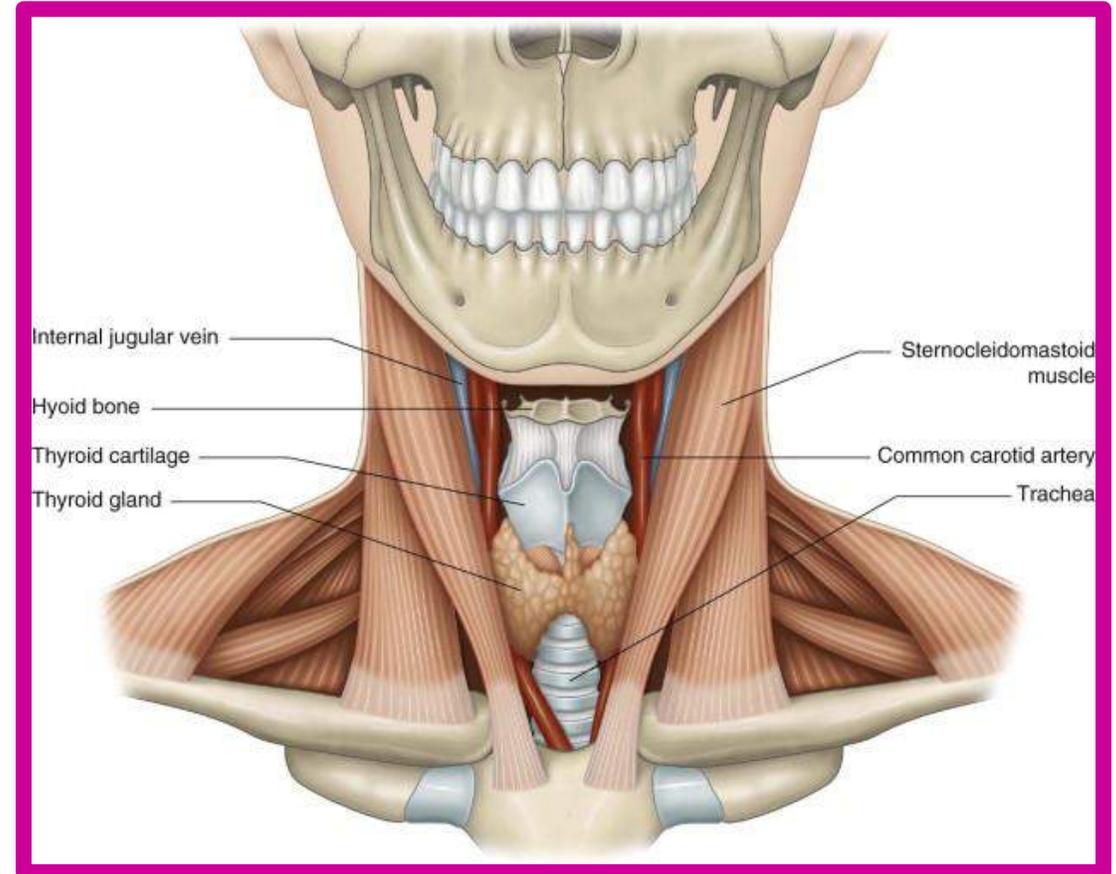
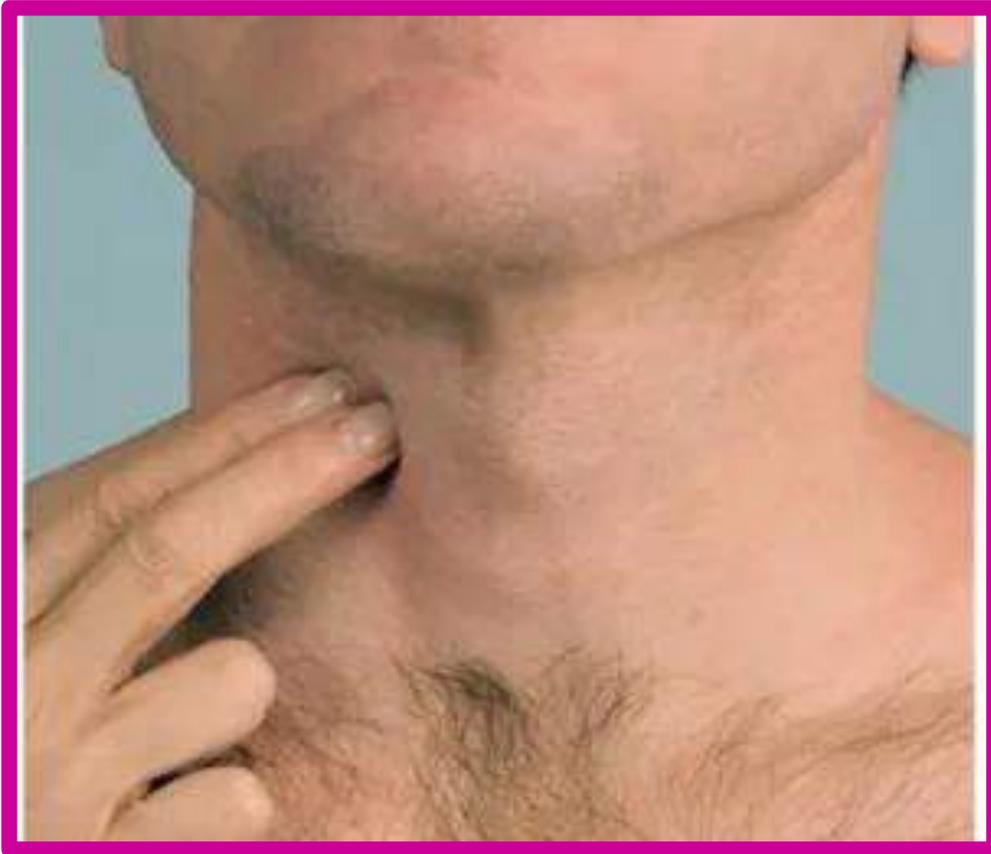
External Carotid Artery

- ❖ is one of the terminal branches of **the common carotid artery**.
- ❖ It supplies structures in the neck, face, and scalp; it also supplies the **tongue** and the **maxilla**.
- ❖ **Begins:** at the level of the upper border of the thyroid cartilage
- ❖ **Terminates:** in the substance of **the parotid gland** behind the neck of the mandible by dividing into **the superficial temporal and maxillary arteries**.



External Carotid Artery

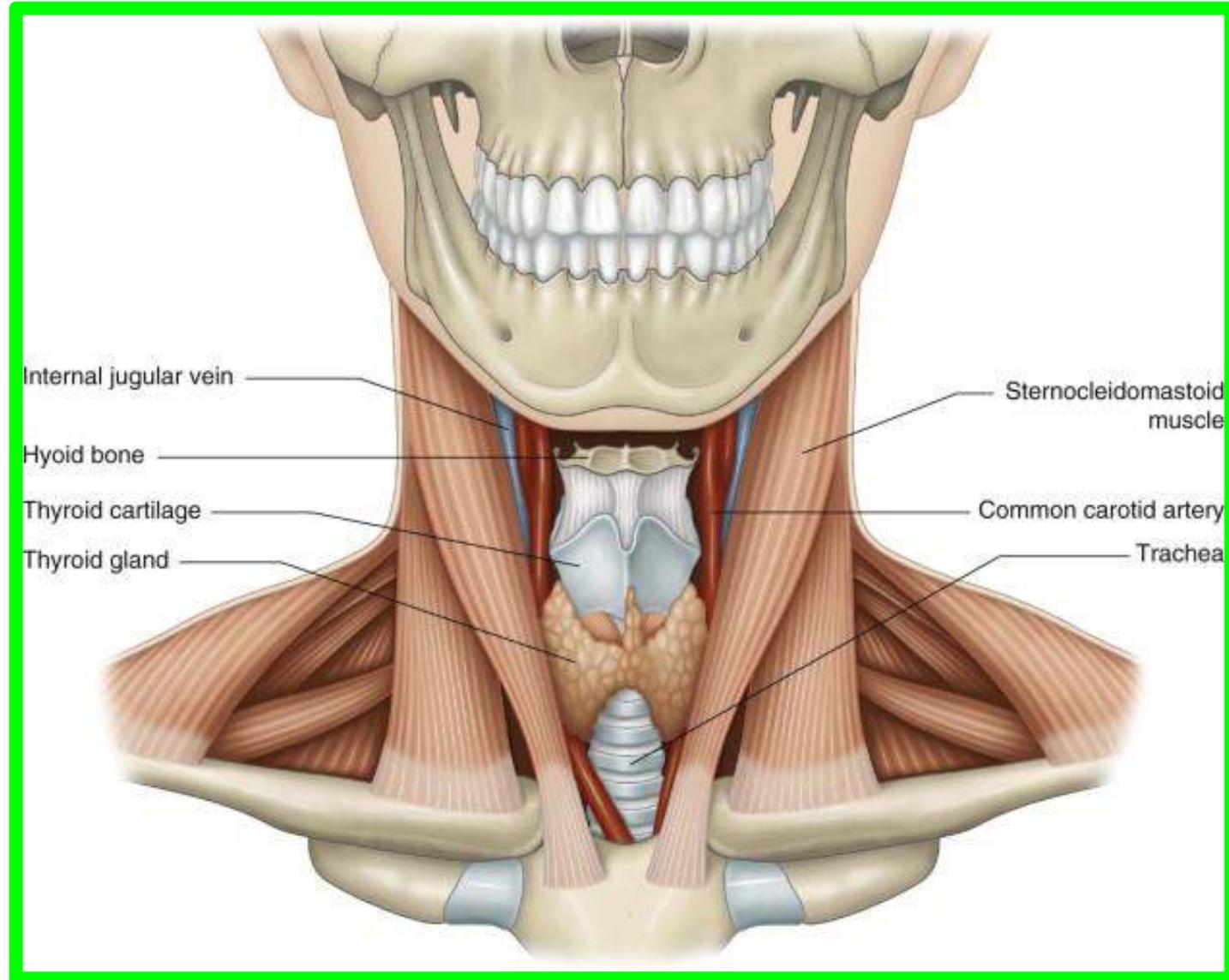
- ❑ Close to its origin, the artery emerges from under cover of **the sternocleidomastoid muscle**, where its pulsations can be felt.
- ❑ At first, it lies medial to **the internal carotid artery**, but as it ascends in the neck, it passes backward and lateral to it.



Relations of the External Carotid Artery

■ ■ Anterolaterally:

- ✓ The artery is overlapped at its beginning by the **anterior border of the sternocleidomastoid**.
- ✓ Above this level, the artery is comparatively superficial, being **covered by skin and fascia**.

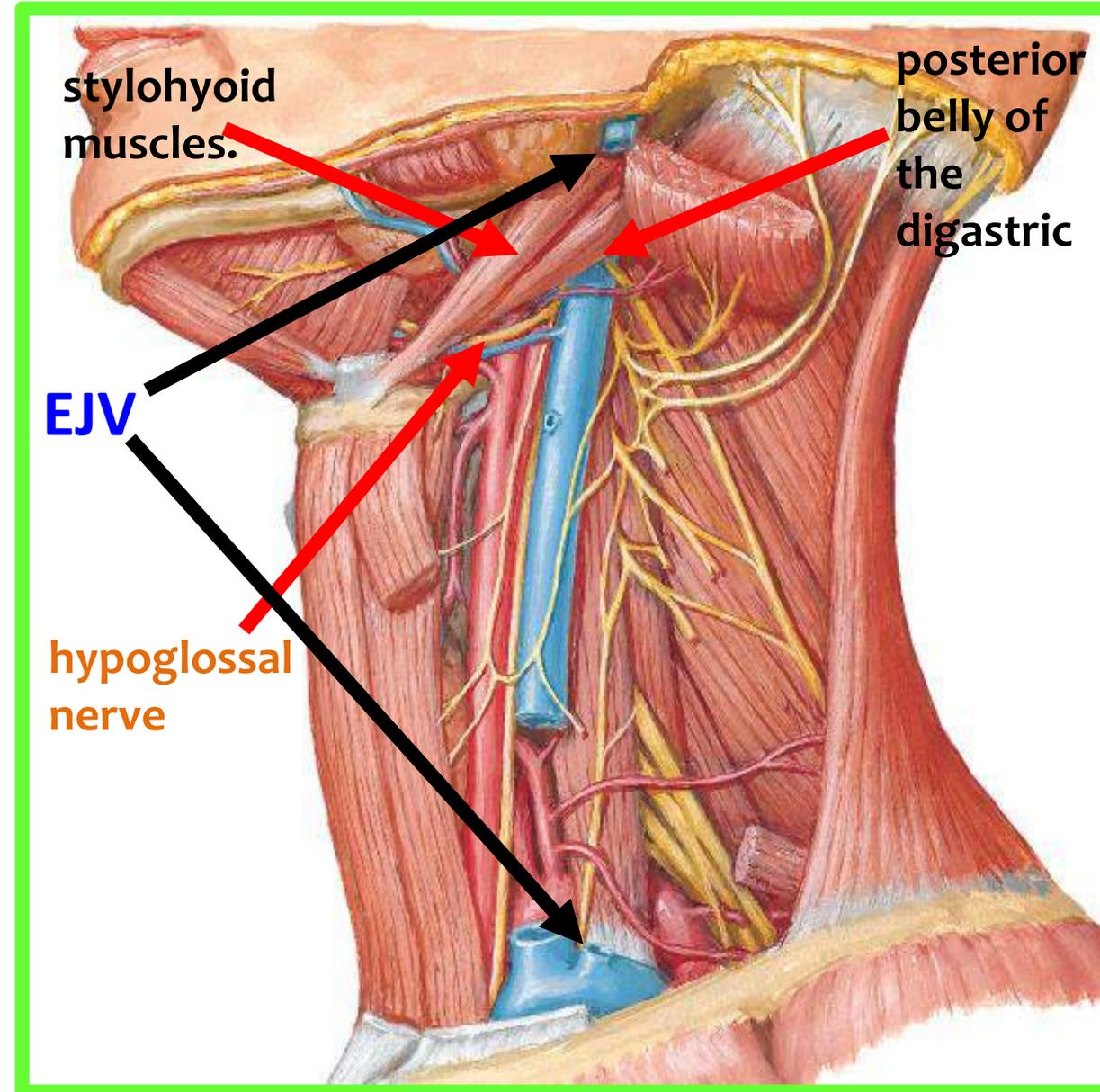
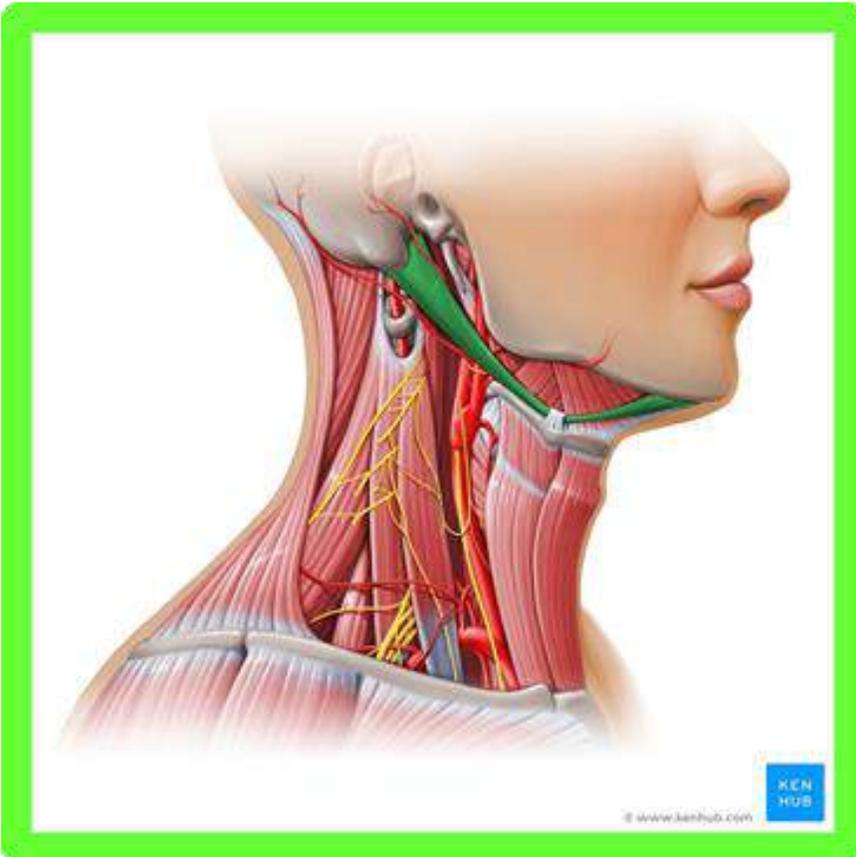


Relations of the External Carotid Artery

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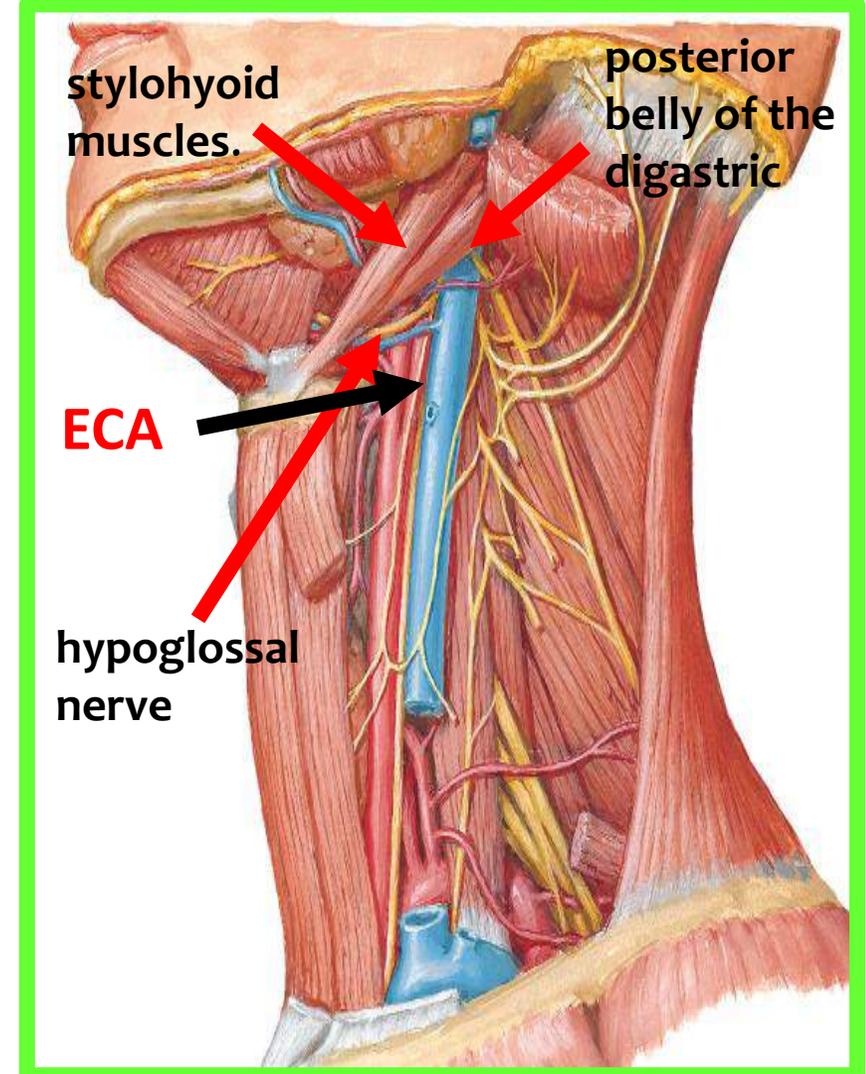
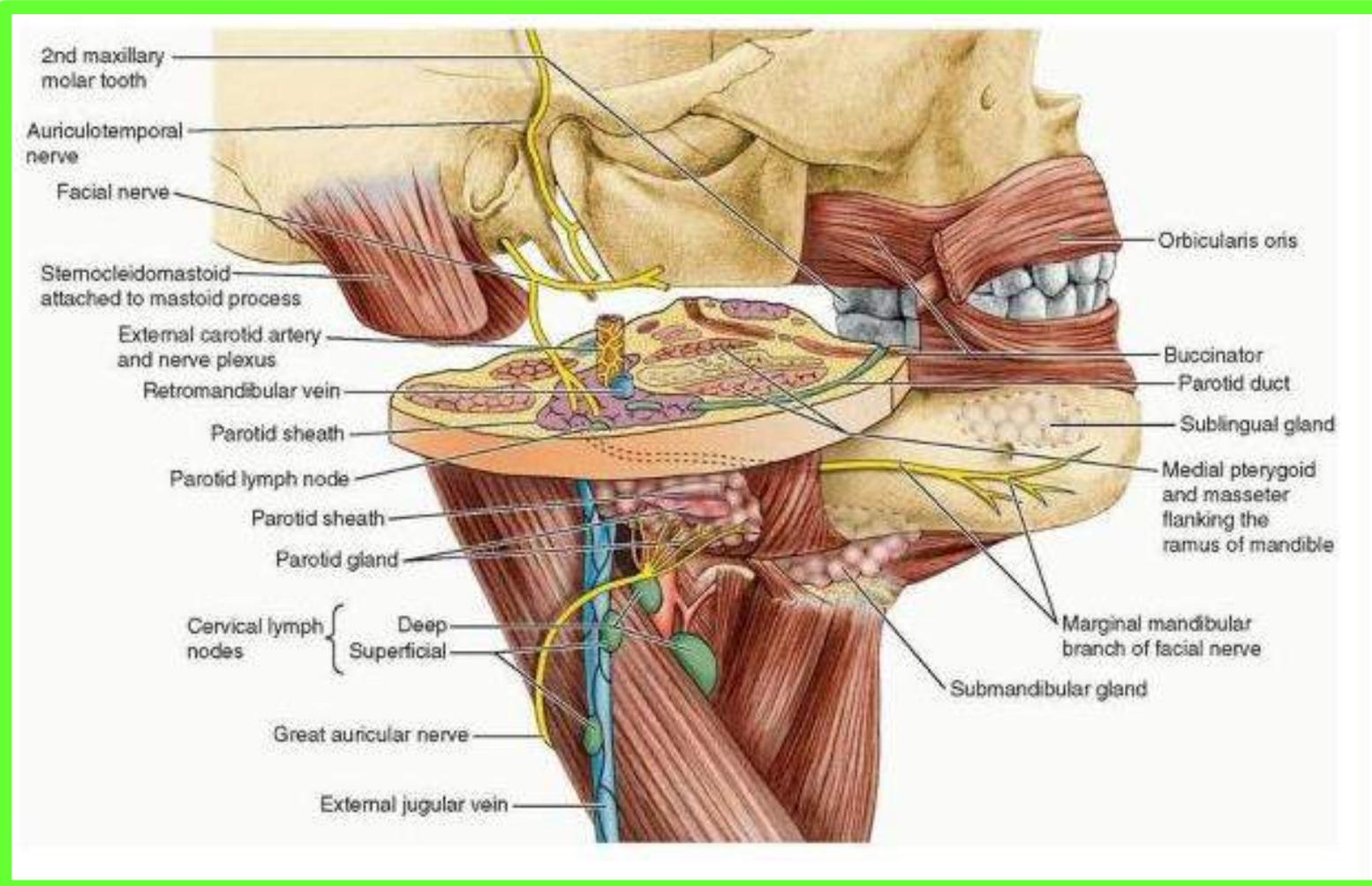
❖ It is crossed by:

- ✓ The hypoglossal nerve
- ✓ The posterior belly of the digastric m
- ✓ The stylohyoid muscle.



Relations of the External Carotid Artery

- ✓ Within the parotid gland, it is crossed by **the facial nerve**
- ✓ **The internal jugular vein** first lies lateral to the artery and then posterior to it.



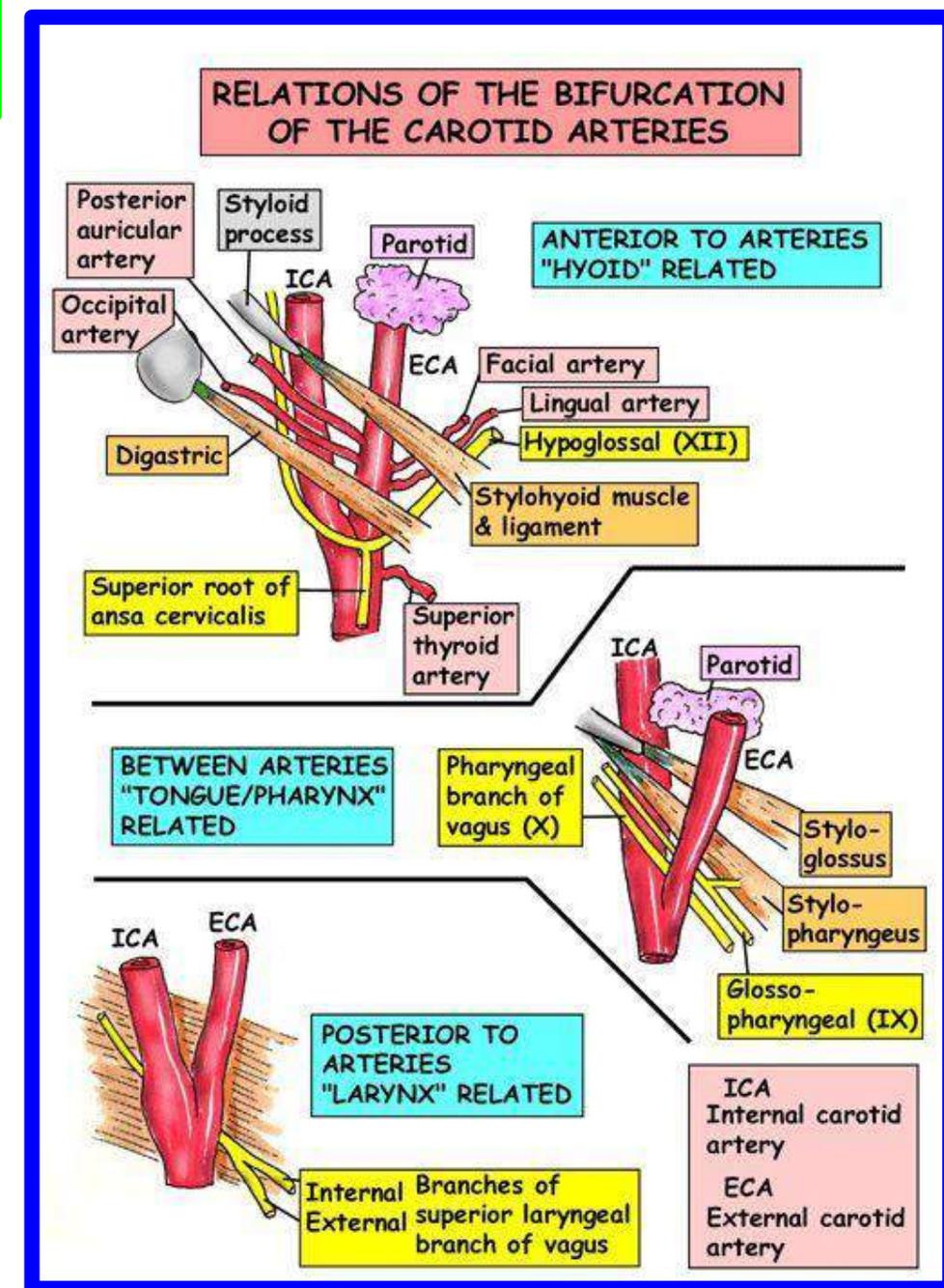
Relations of the External Carotid Artery

■ Medially: The wall of the pharynx and the internal carotid artery.

- The stylopharyngeus muscle,
- The styloglossus muscle
- the glossopharyngeal nerve, and
- the pharyngeal branch of the vagus pass between the external and internal carotid arteries

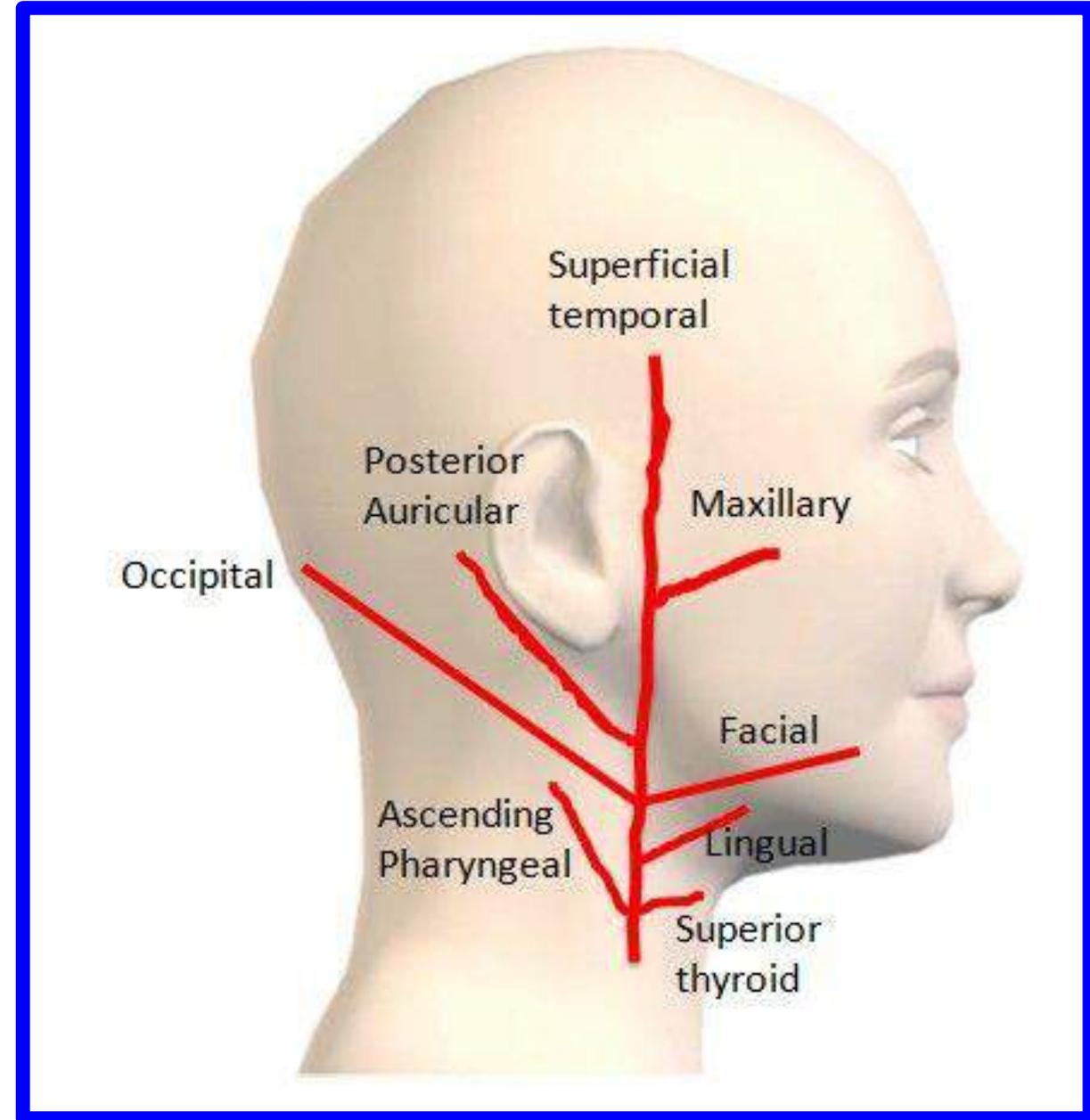
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Branches of the External Carotid Artery

- Superior thyroid artery
- Ascending pharyngeal artery
- Lingual artery
- Facial artery
- Occipital artery
- Posterior auricular artery
- Superficial temporal artery
- Maxillary artery



Branches of the External Carotid Artery

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❑ Superior Thyroid Artery

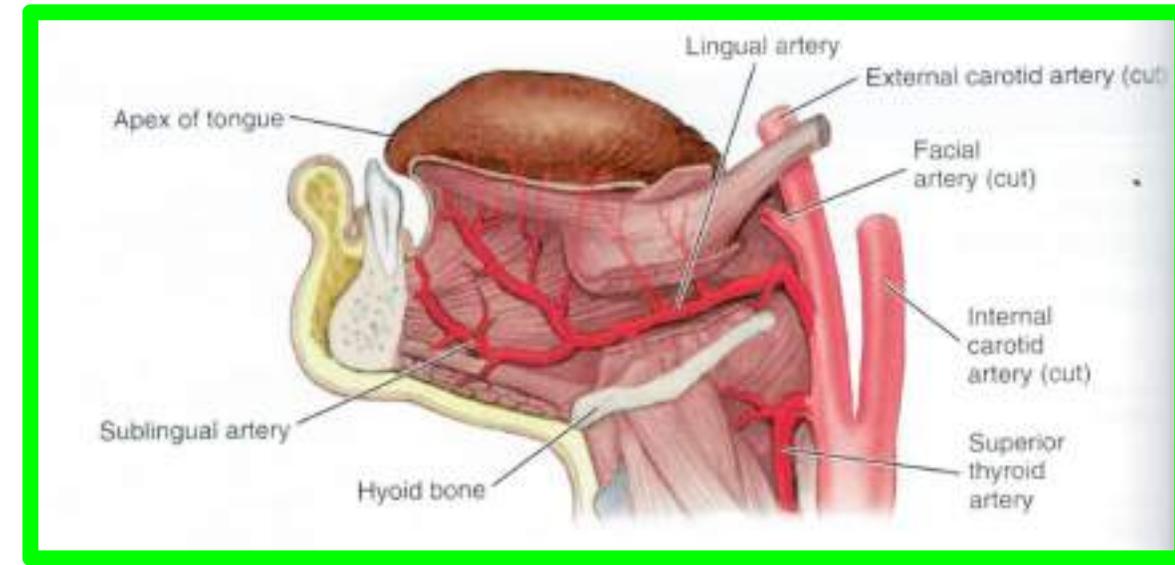
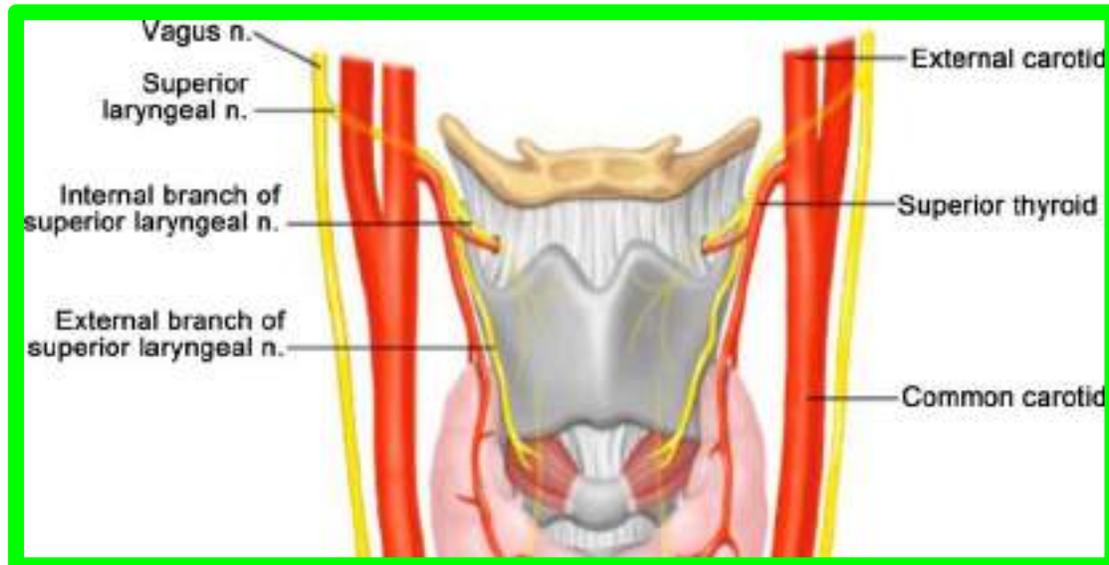
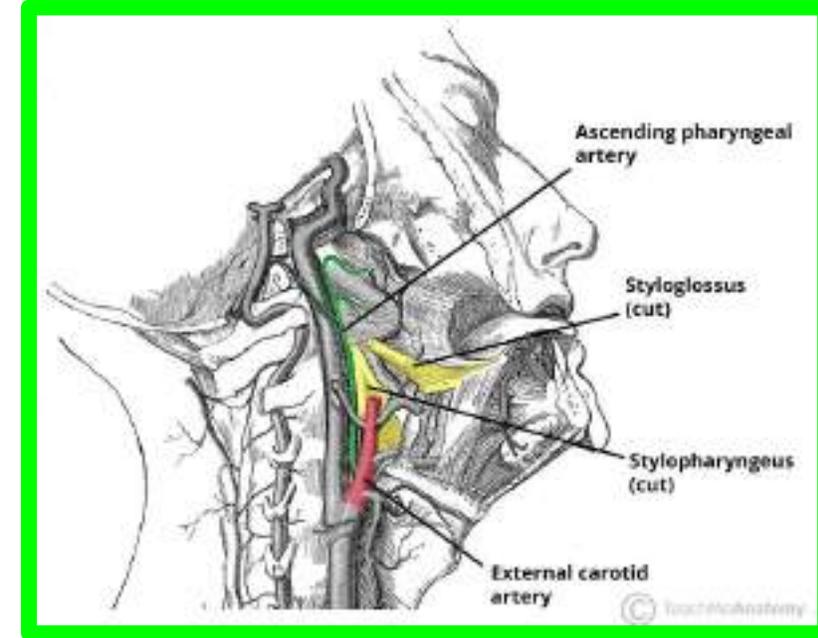
to the upper pole of the thyroid gland.

❑ Ascending Pharyngeal Artery

Ascends along and supplies the pharyngeal wall.

❑ Lingual Artery

Loops upward and forward and supplies the tongue



Branches of the External Carotid Artery

❑ Occipital Artery

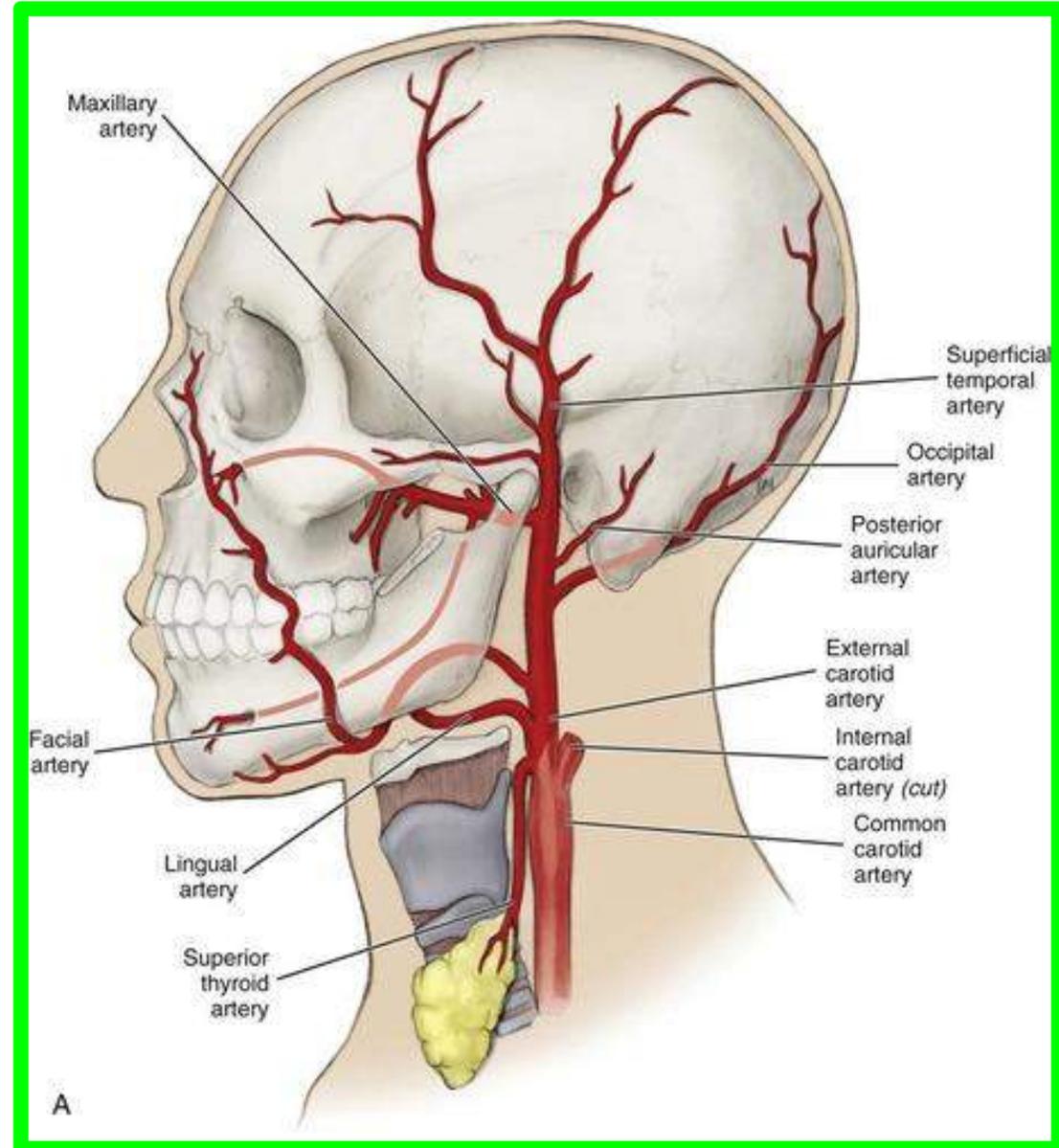
supplies the back of the scalp

❑ Posterior Auricular Artery

Supplies the auricle and the scalp

❑ Superficial Temporal Artery

Ascends over the zygomatic arch, where it may be palpated just in front of the auricle supplies the scalp.



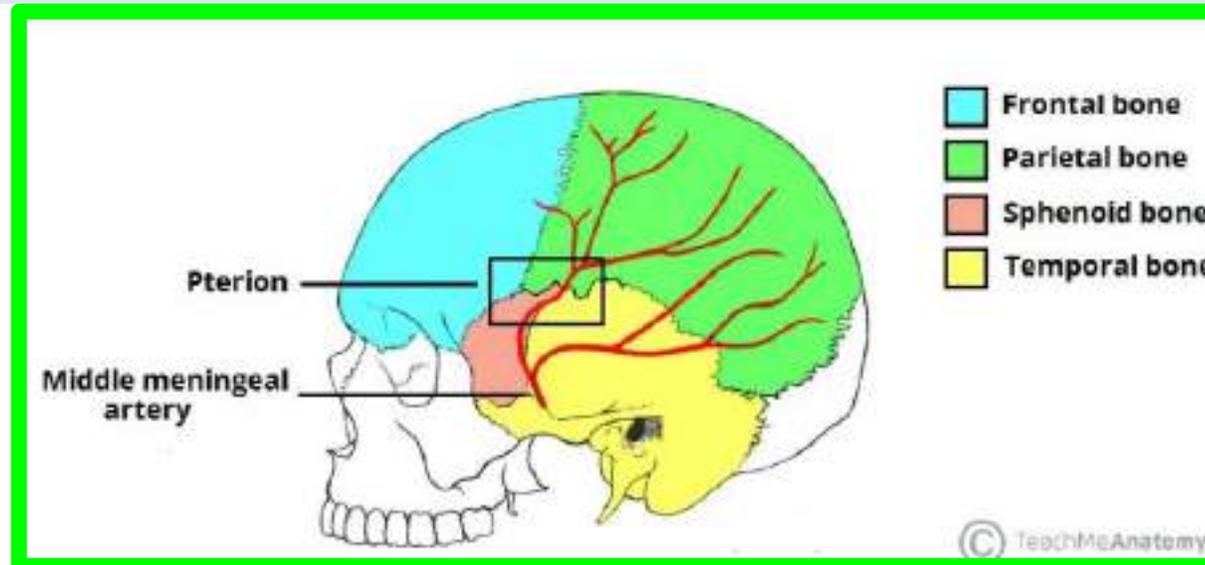
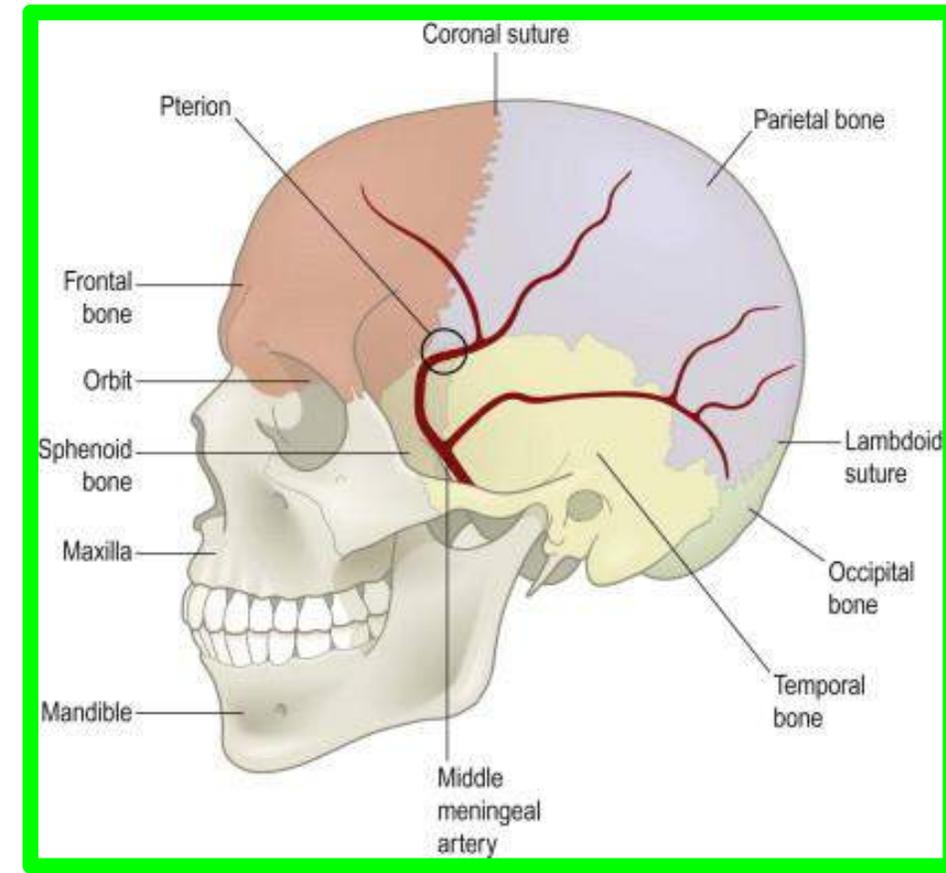
❑ Middle Meningeal Artery (Maxillary Artery)

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- ✓ arises from the first part of the maxillary artery
- ✓ Enters the skull through **the foramen spinosum**
- ✓ divides into **anterior** and **posterior branches**
- ✓ **the largest of the three arteries that supply the meninges**
- ✓ **The anterior branch** is important because it lies close to the motor area of the cerebral cortex of the brain.

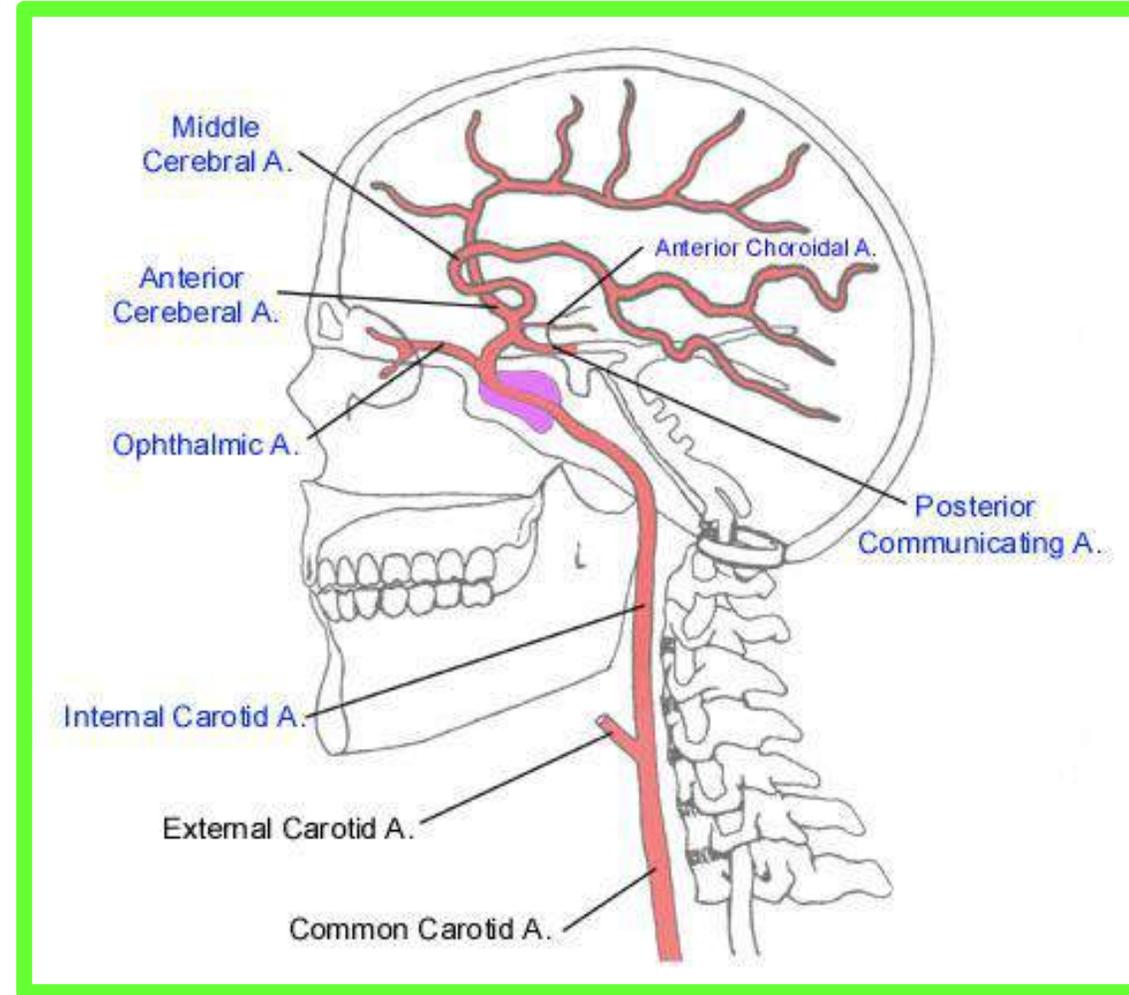
A rupture of the MMA, especially **at the pterion** can lead to a collection of blood called an **epidural hematoma**. (a life-threatening condition)



Internal Carotid Artery

****begins:** at the bifurcation of the common carotid artery at the level of the upper border of the thyroid cartilage.

- ❖ It supplies the **brain**, the **eye**, the **forehead**, and part of the **nose**.
- ❖ The artery ascends in the neck embedded in **the carotid sheath** with the **internal jugular vein** and **vagus nerve**.
- ❖ At first it lies superficially; it then passes deep to the parotid salivary gland



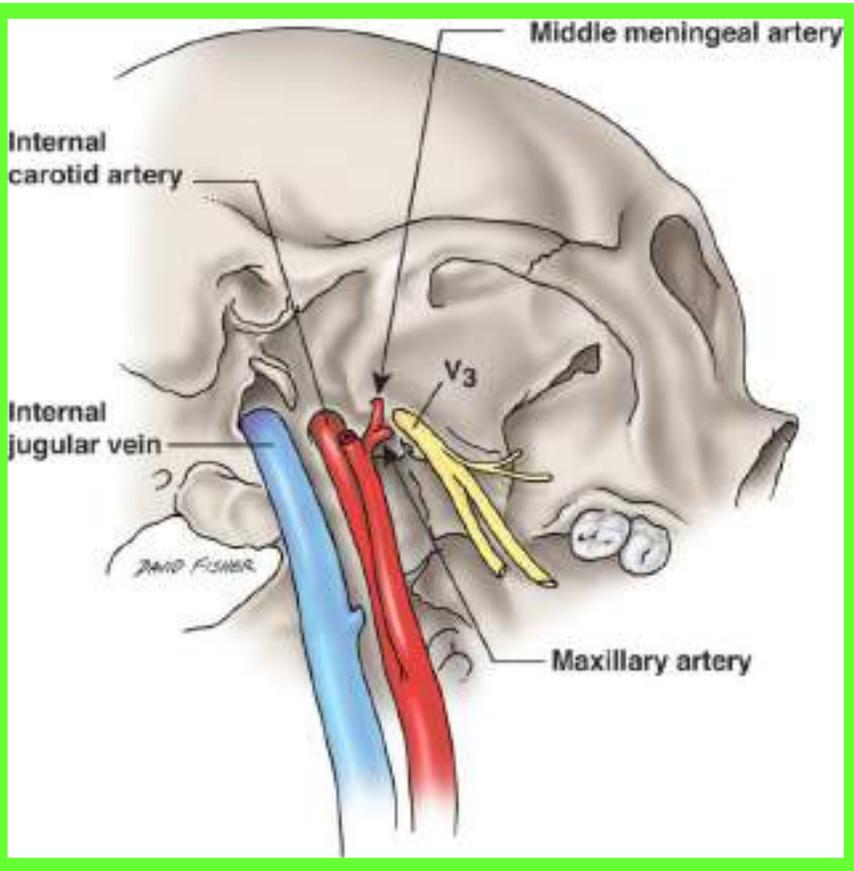
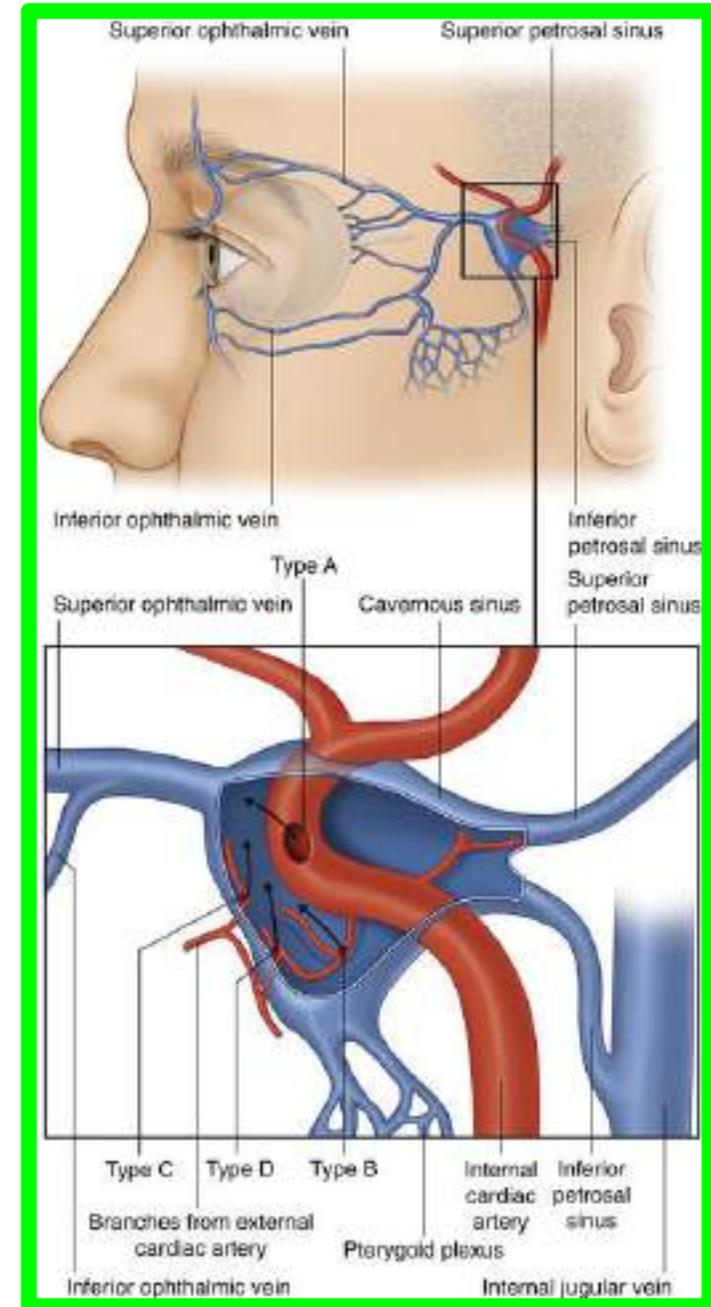
Internal Carotid Artery

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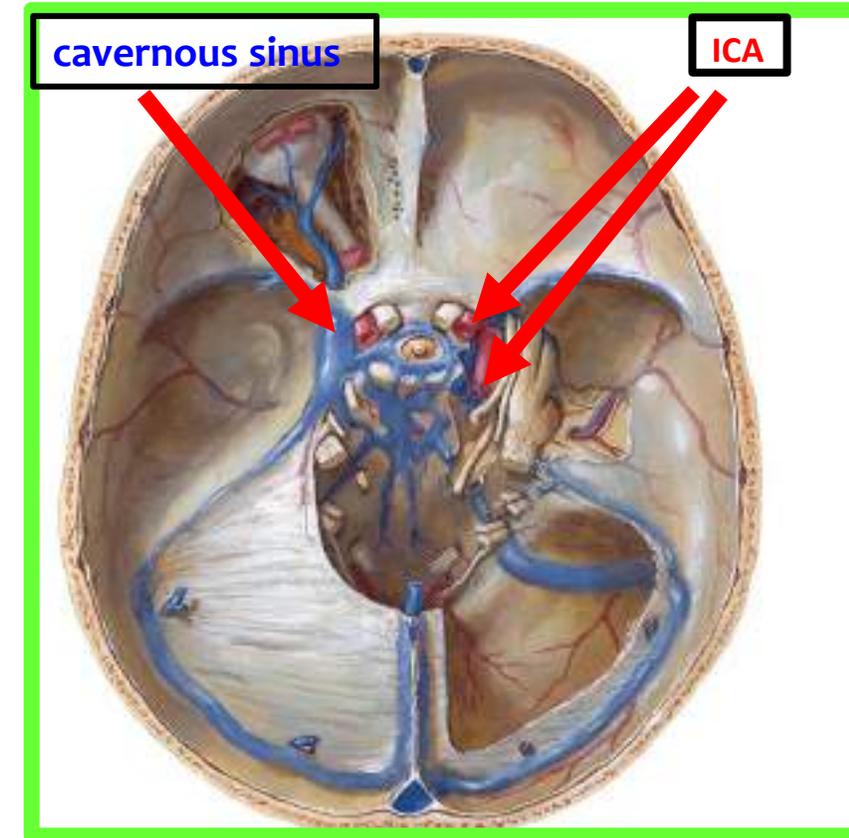
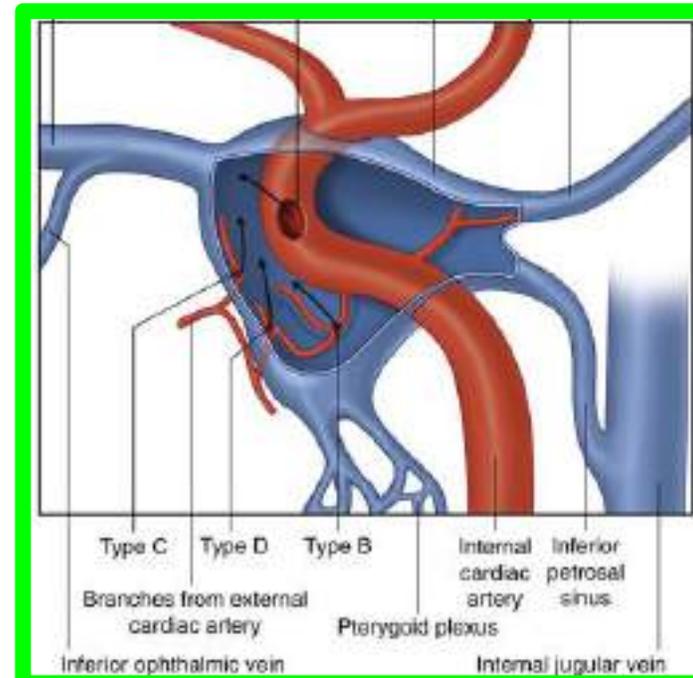
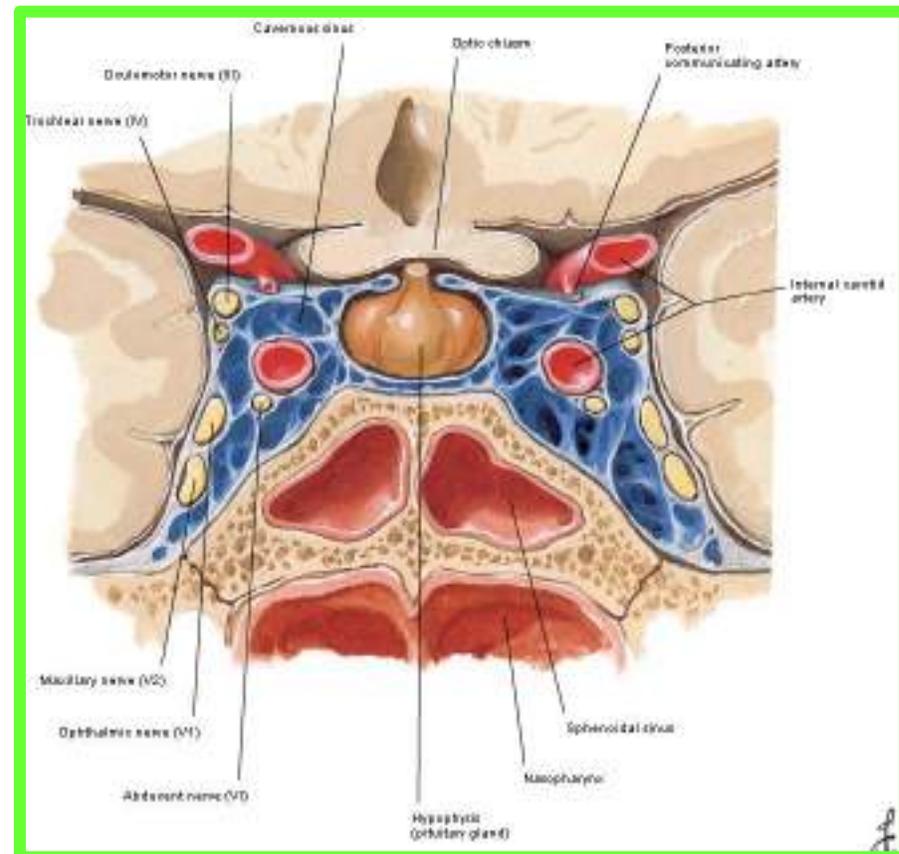
❖ leaves the neck by passing into the cranial cavity through the carotid canal in the petrous part of the temporal bone.

❖ It then passes upward and forward in the cavernous venous sinus (without communicating with it).



Internal Carotid Artery

- ✓ The artery then leaves **the sinus** and passes upward
- ✓ then inclines backward, lateral to the optic chiasma
- ✓ terminates by dividing into **the anterior** and **the middle cerebral arteries**



Branches of the Internal Carotid Artery

❖ There are no branches in the neck.

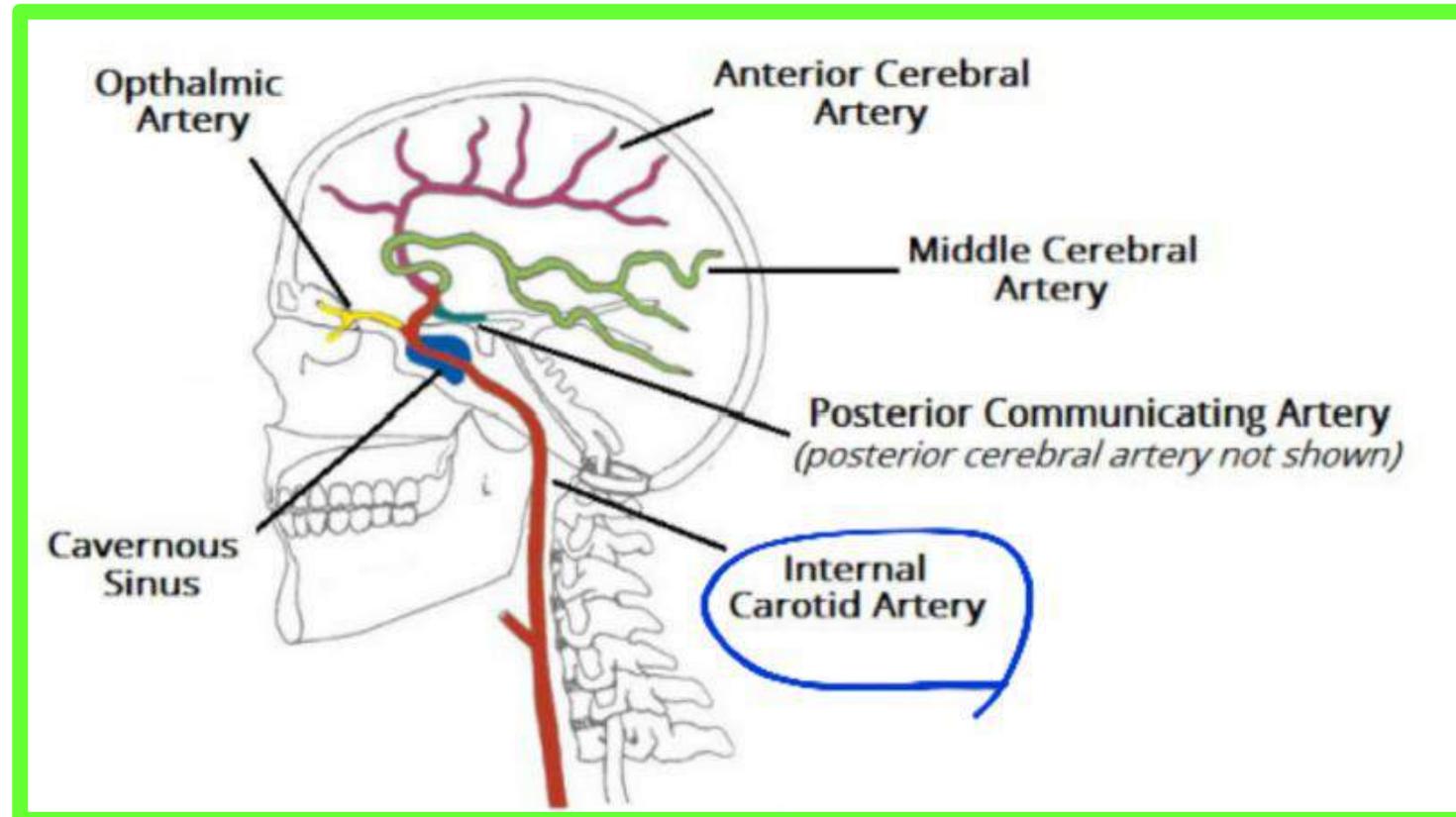
Ophthalmic Artery

Posterior Communicating Artery

Anterior Cerebral Artery

Middle Cerebral Artery

Circle of Willis

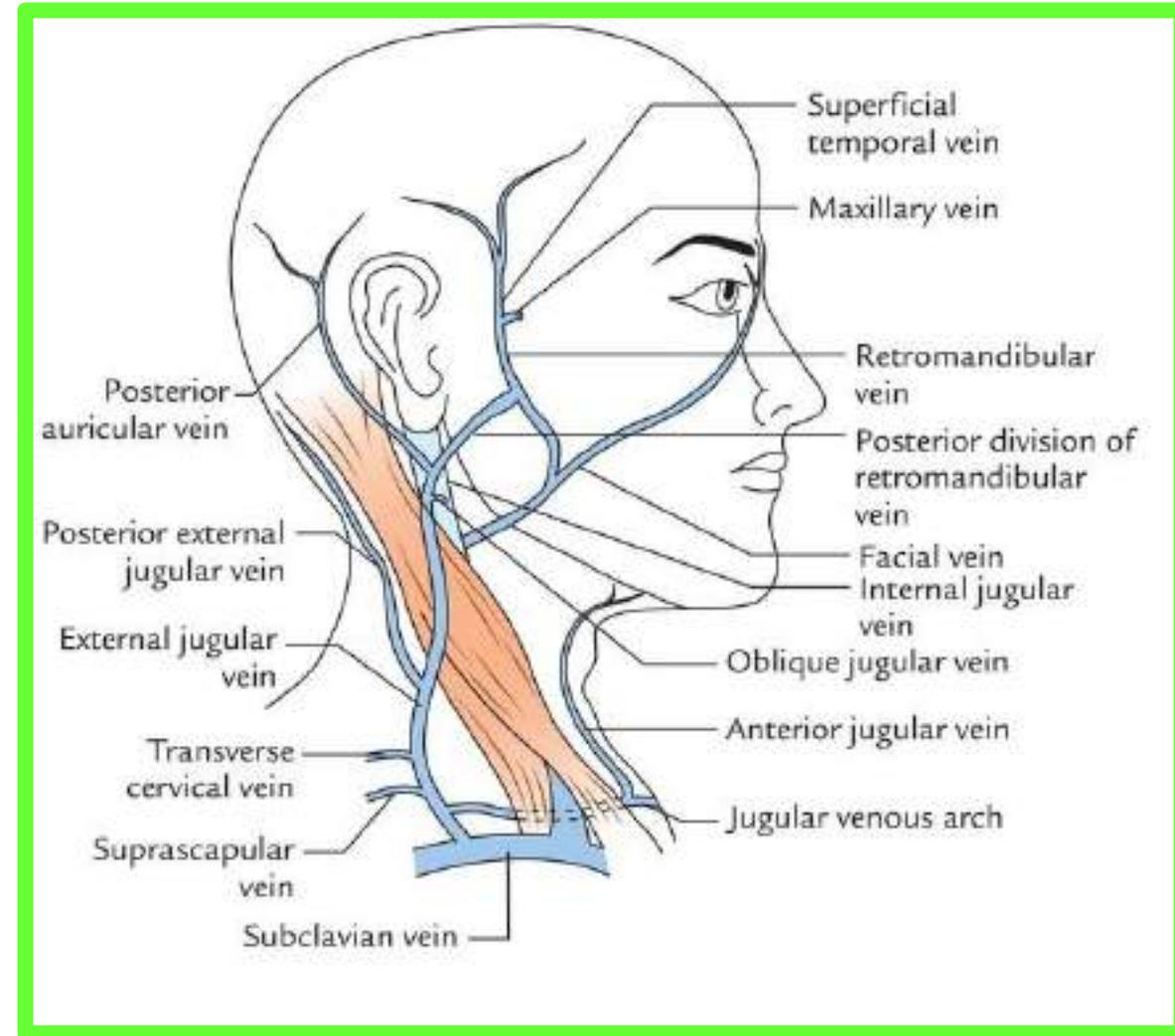


Veins of the Face and the Neck

External Jugular Vein

Is formed behind the angle of the jaw by the union of **the posterior auricular vein** with the **posterior division of the retromandibular vein**

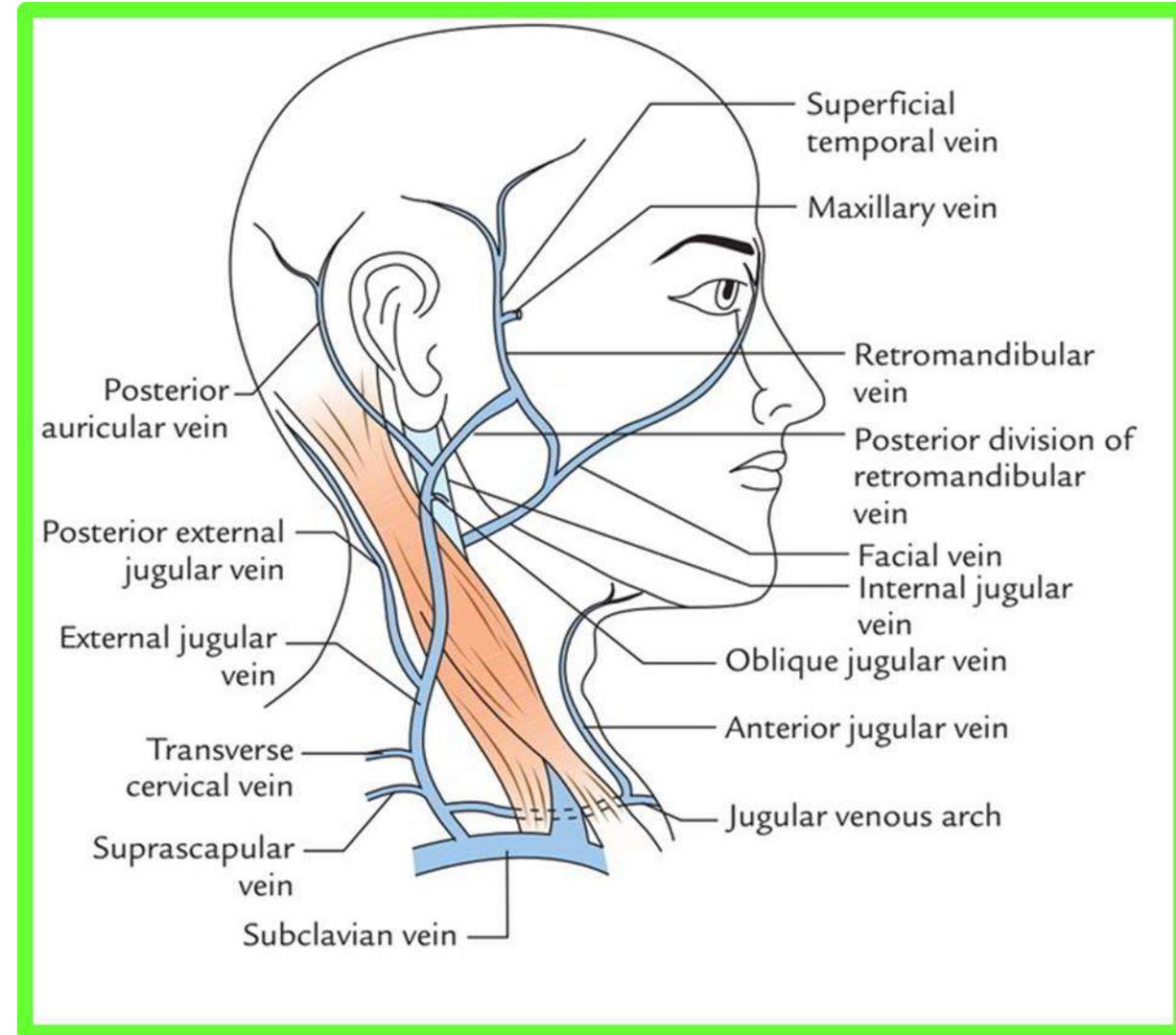
It descends across **the sternocleidomastoid muscle** and beneath **the platysma muscle**, and it drains into **the subclavian vein** behind the middle of the clavicle.



External Jugular Vein

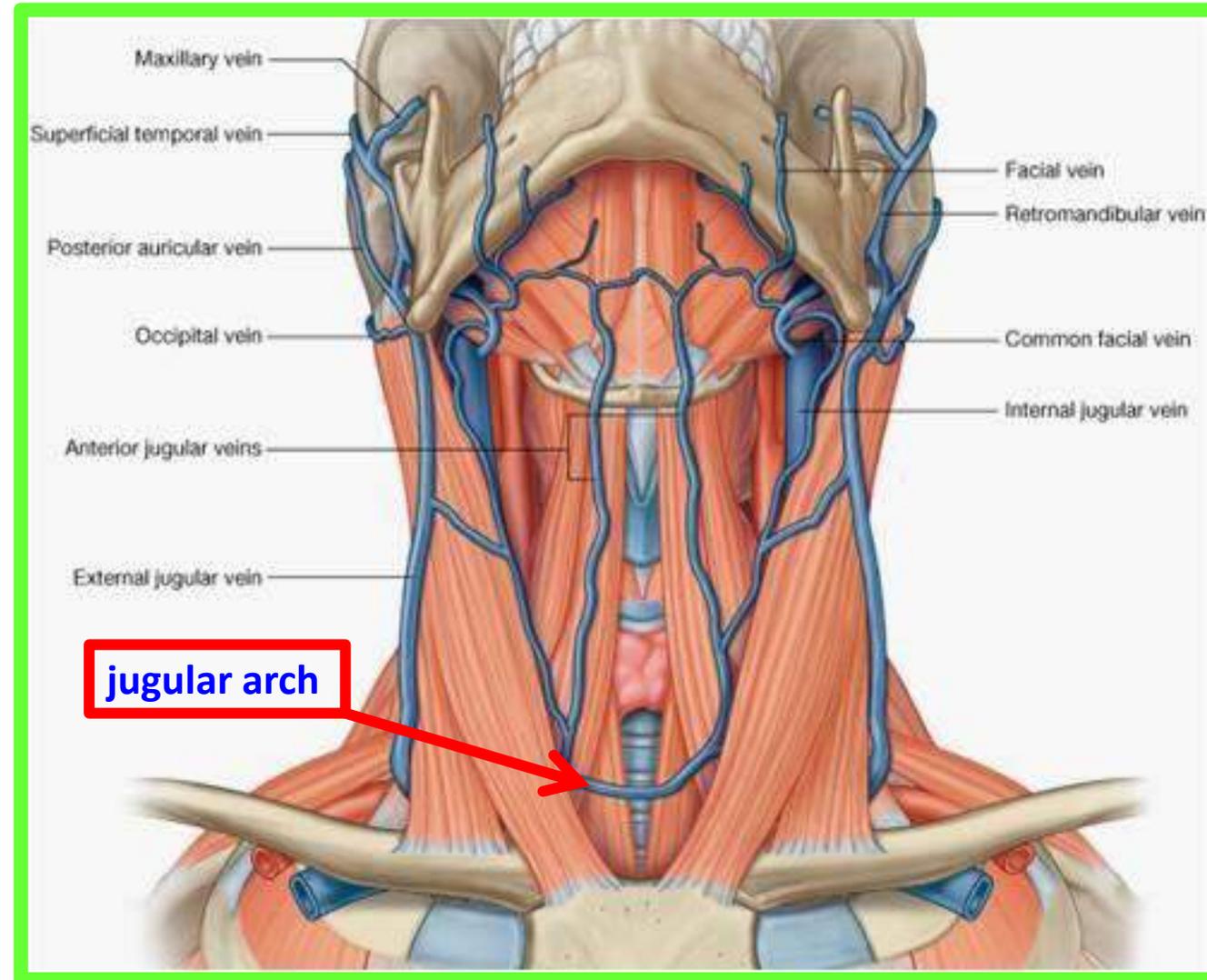
Tributaries

- ✓ **Posterior external jugular vein** from the back of the scalp
- ✓ **Transverse cervical vein** from the skin and the fascia over the posterior triangle
- ✓ **Suprascapular vein** from the back of the scapula
- ✓ **Anterior jugular vein**



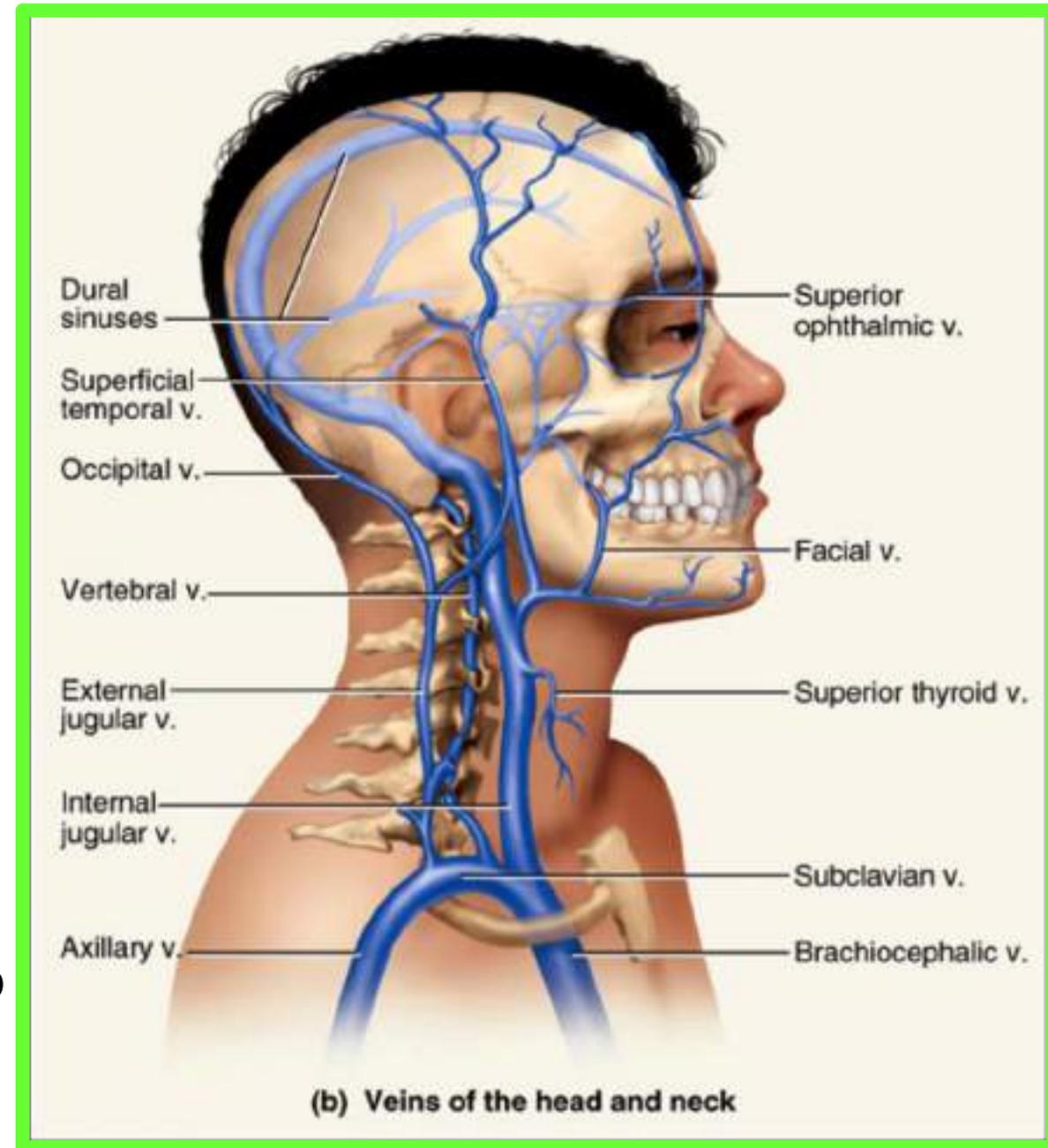
Anterior Jugular Vein

- ✓ descends in the front of the neck close to the midline
- ✓ Just above the sternum, it is joined to the opposite vein **by the jugular arch**.
- ✓ The **anterior jugular vein** joins the **external jugular vein** deep to **the sternocleidomastoid muscle**.

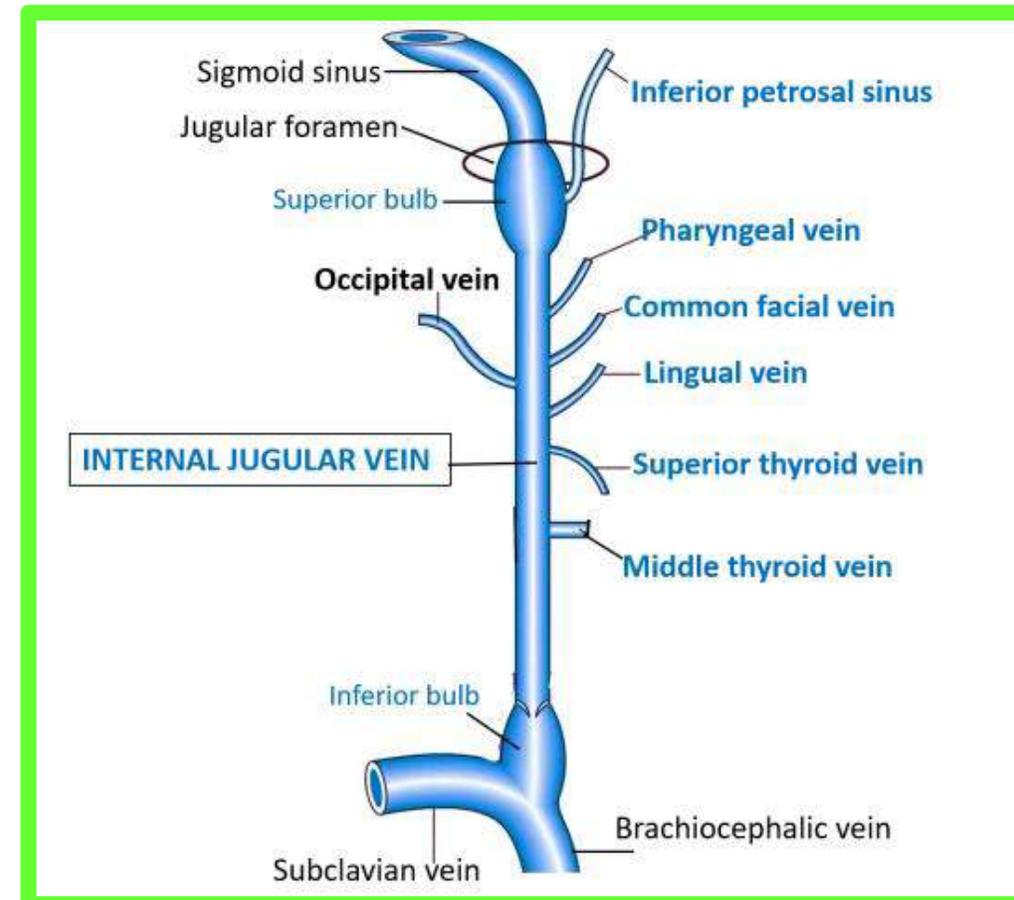
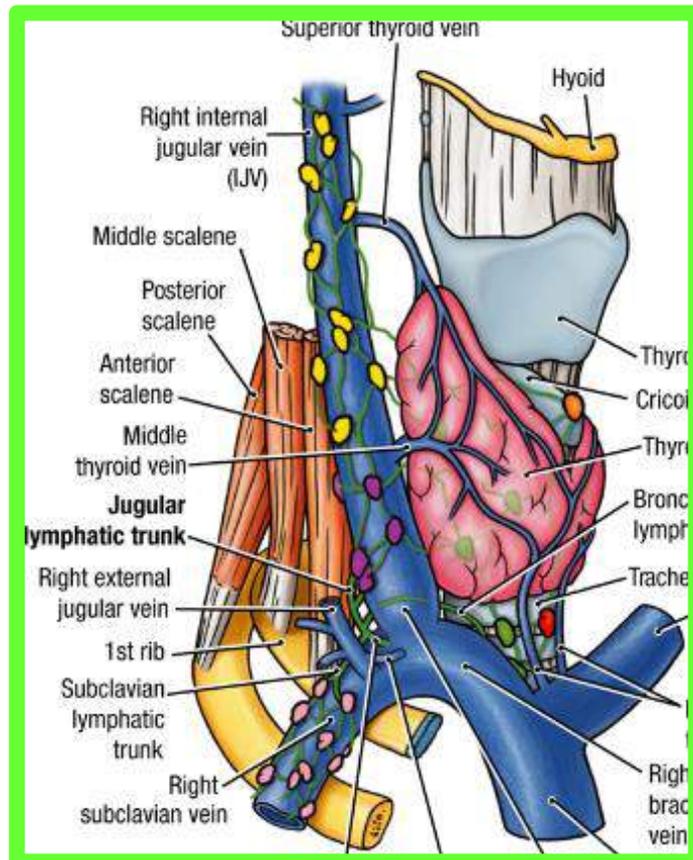


Internal Jugular Vein

- ❖ Is a large vein that receives blood from the **brain, face, and neck**
- ❖ It starts as a continuation of **the sigmoid sinus** and leaves the skull through **the jugular foramen**.
- ❖ It then descends through the neck in **the carotid sheath** lateral to **the vagus nerve** and the **internal and common carotid arteries**.
- ❖ It ends by joining **the subclavian vein** behind the medial end of the clavicle to form **the brachiocephalic vein**

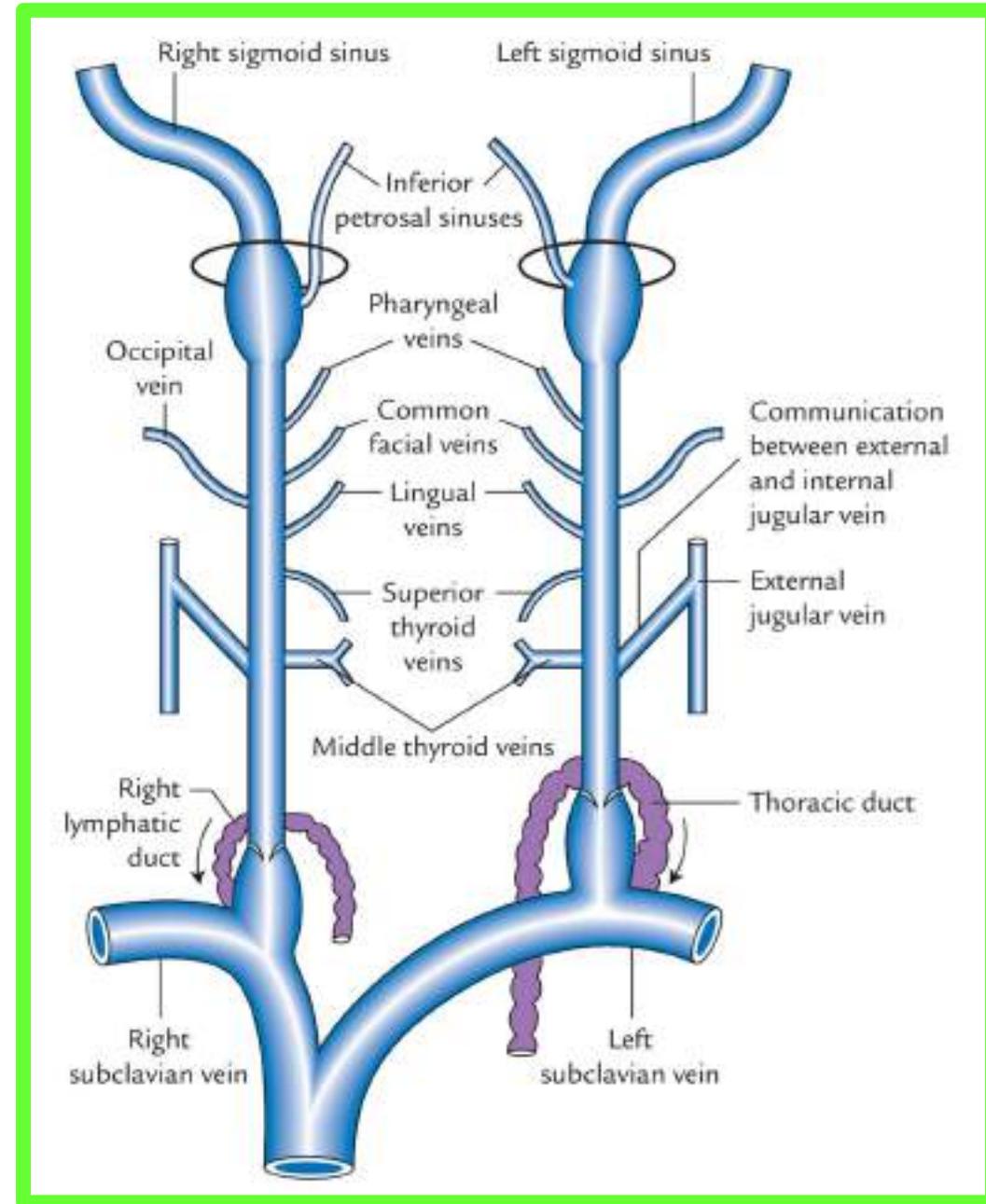
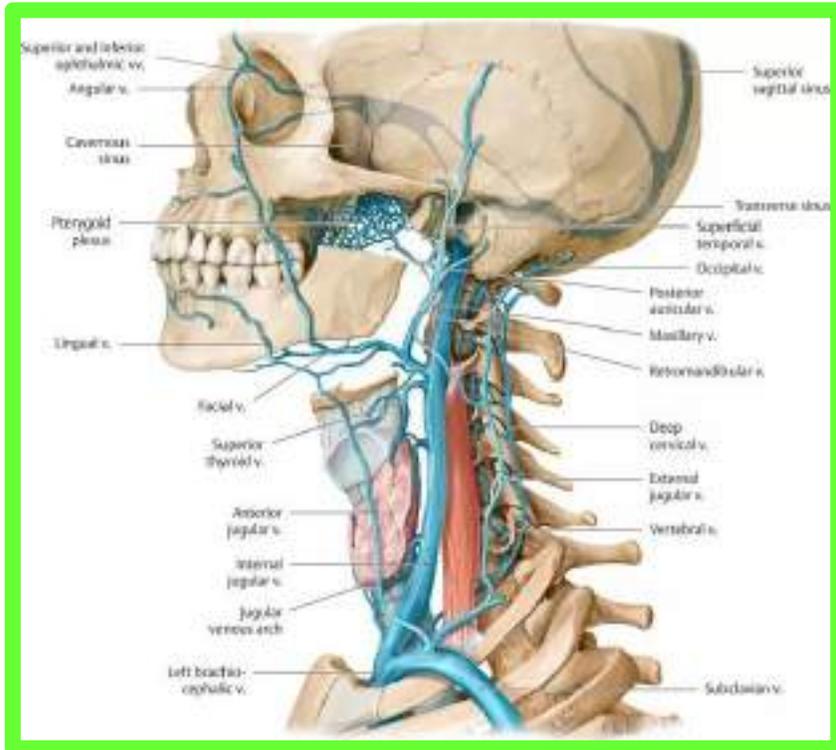


- ❑ Throughout its course, it is closely related to **the deep cervical lymph nodes**.
- ❑ The vein has a dilatation at its upper end called **the superior bulb** and another near its termination called **the inferior bulb**.
- ❑ Directly above **the inferior bulb** is a bicuspid valve.



Tributaries of the Internal Jugular Vein

- Inferior petrosal sinus
- Facial vein
- Pharyngeal veins
- Lingual vein
- Superior thyroid vein
- Middle thyroid vein



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