



CVS....

Lecture (7)

Blood vessels I – Arterial system

Anatomy of the Arteries in the Head & Neck regions.

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ILOs

1. To describe the course, relations and branches of arch of aorta.
2. To describe the common, external and internal carotid arteries concerning with their course, relations and branches.
3. To describe branches of the subclavian artery in the head and neck regions.

Arch of aorta

Beginning:

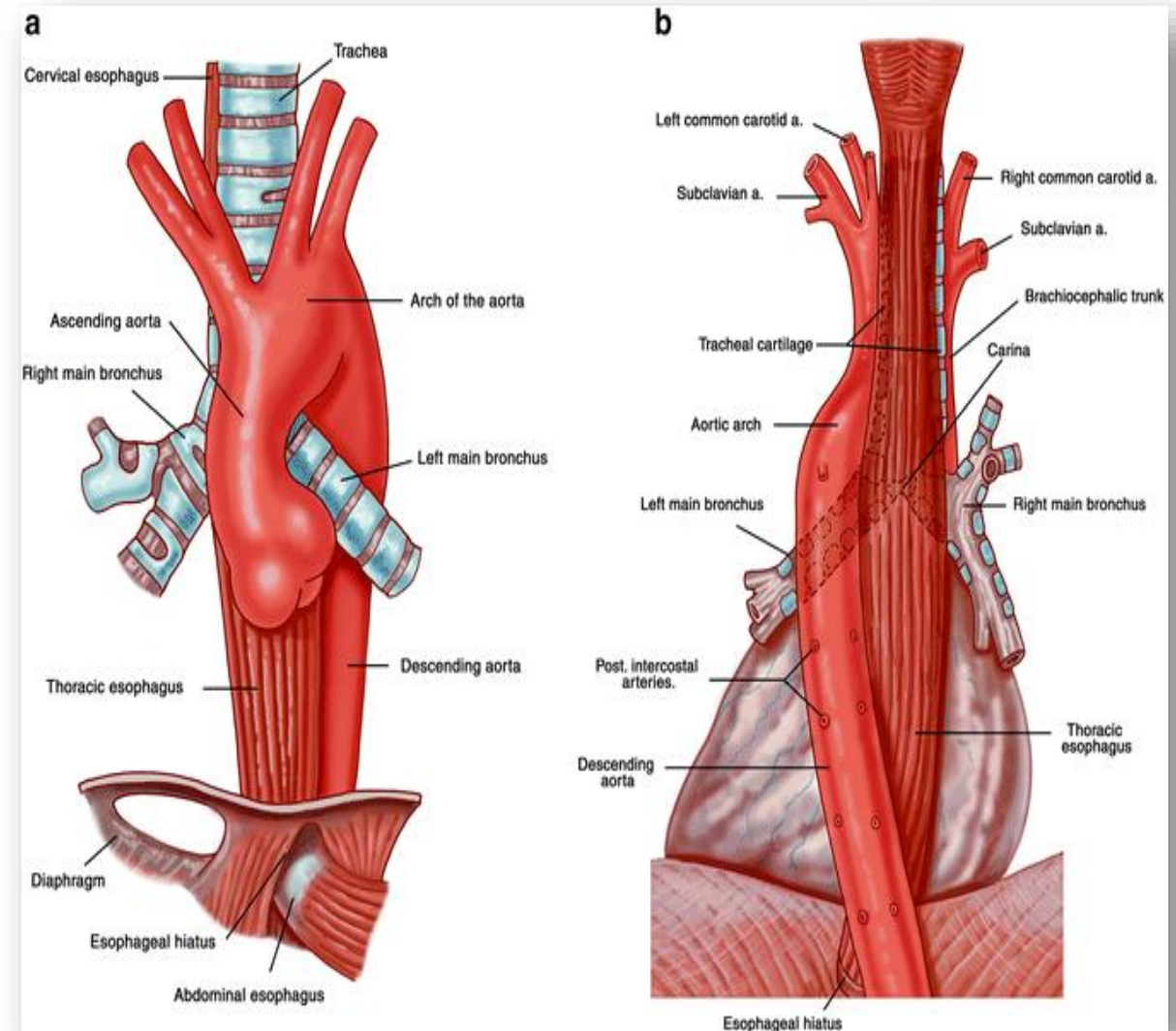
- Begins at sternal end of **right 2nd costal cartilage** as a **continuation of the ascending aorta**.

Course:

- It **arches upward, backward and to the left** in front of the trachea.
- Then **arches backward & downward** across left side of the trachea.

End:

- It ends at the left side of T4 vertebra, to be continuous with the descending thoracic aorta.



Relations of the arch of the aorta:

Above it:

- Its 3 large branches & Left brachiocephalic vein.

Below it:

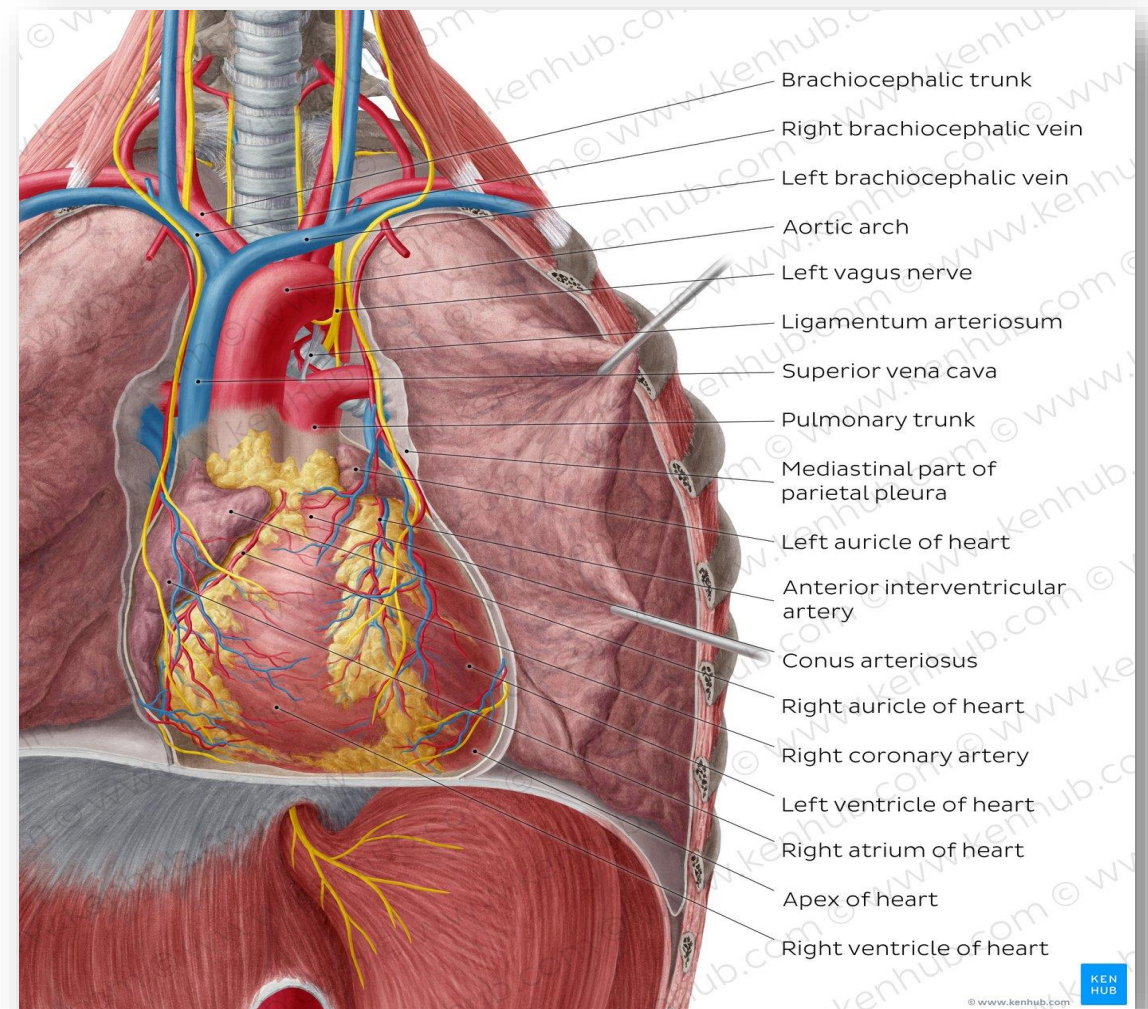
- Pulmonary bifurcation.
- Left principal bronchus.

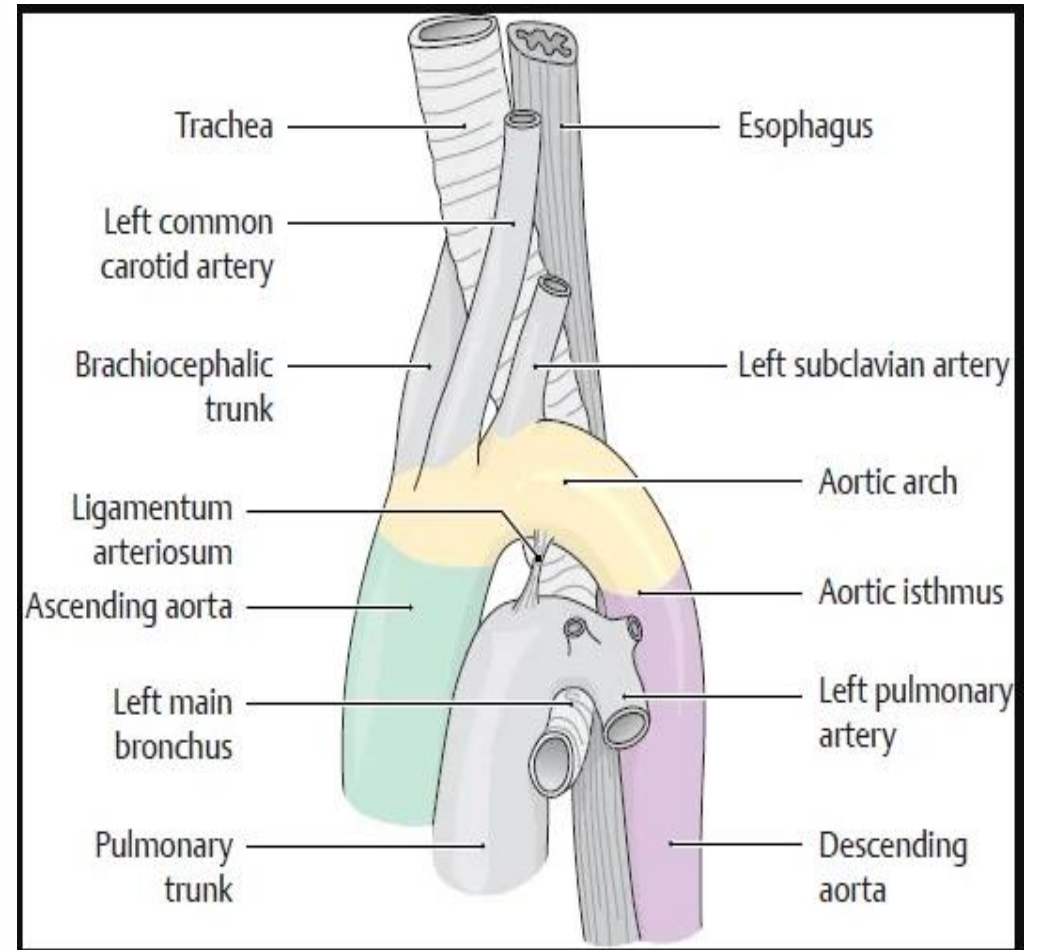
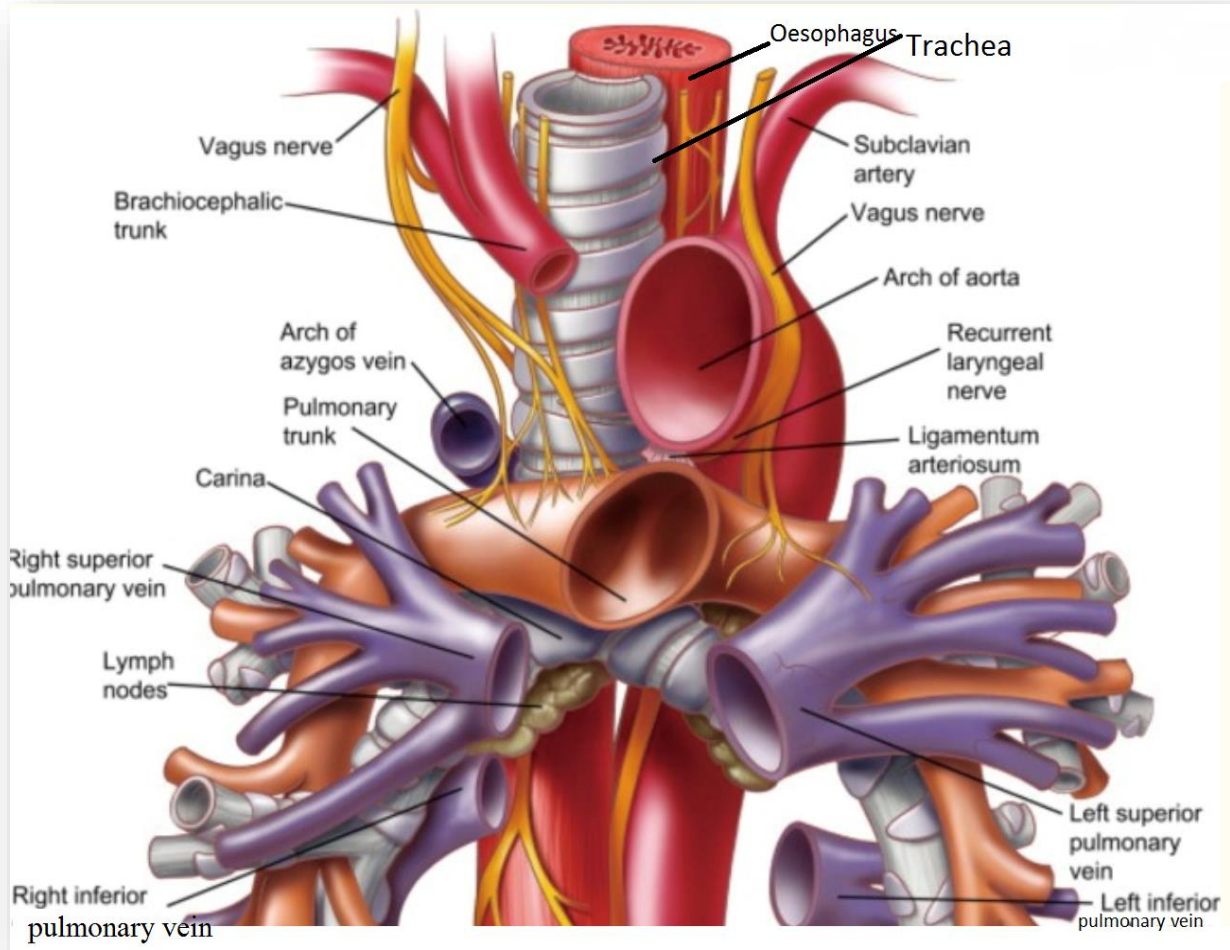
Anterior & to the left:

- Lt vagus.
- Lt lung & pleura.- Manubrium of the sternum.

Posterior & to the right:

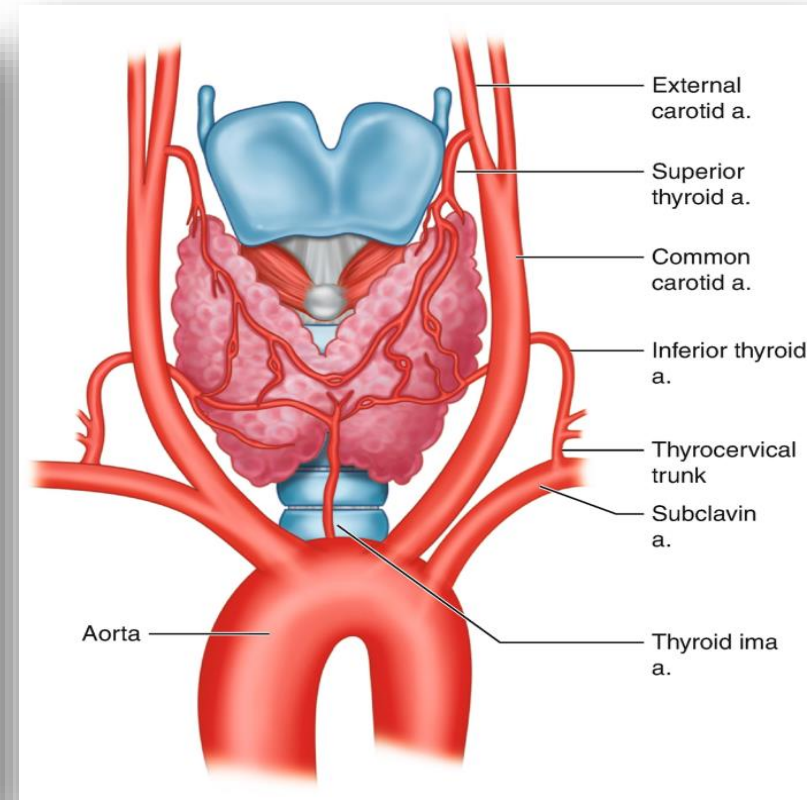
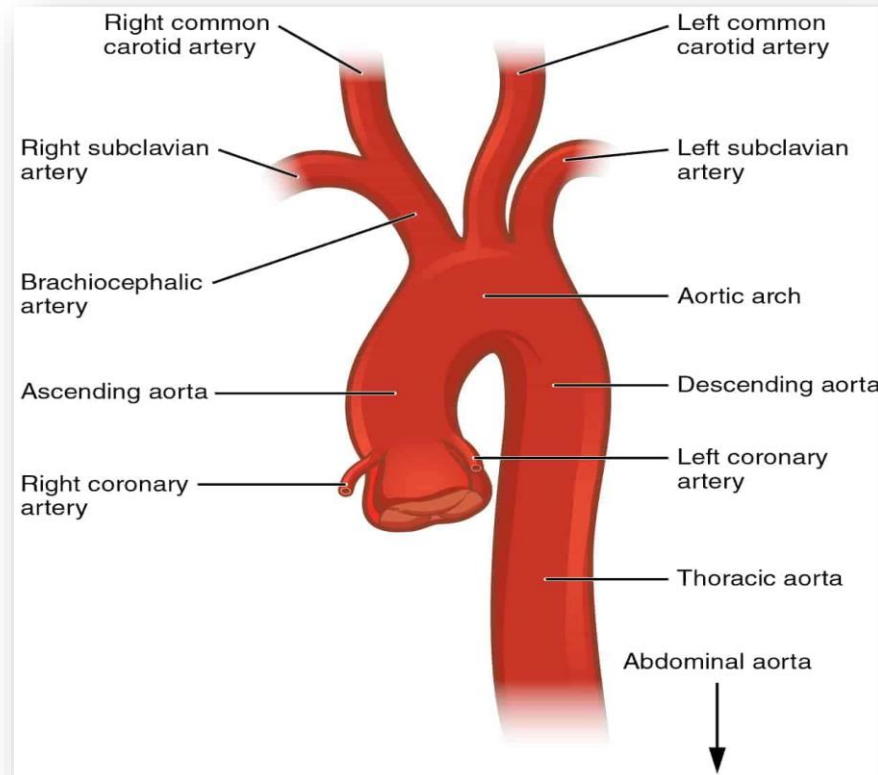
- Trachea- Oesophagus.
- Vertebral column.





Branches of the arch of the aorta:

- 1) Brachiocephalic artery.
- 2) Left common carotid artery.
- 3) Left subclavian artery.
- 4) Thyroida ima artery.



Brachiocephalic (innominate) artery:

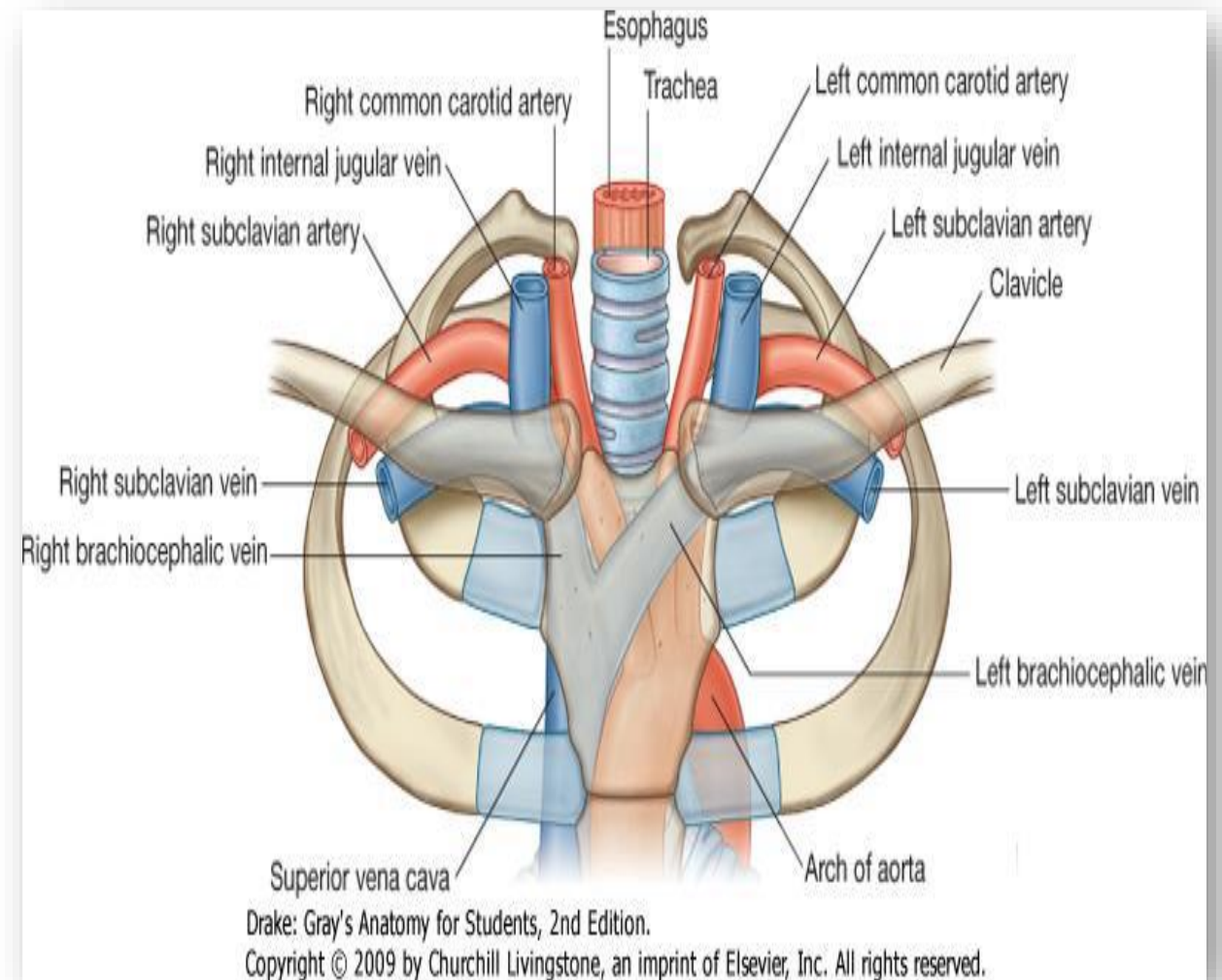
- Largest branch of the aortic arch.

Course:

- It ascends upward & to the right.

End:

- It **ends behind** the right sternoclavicular joint **as it divides** into the **right common carotid** and **right subclavian** arteries.



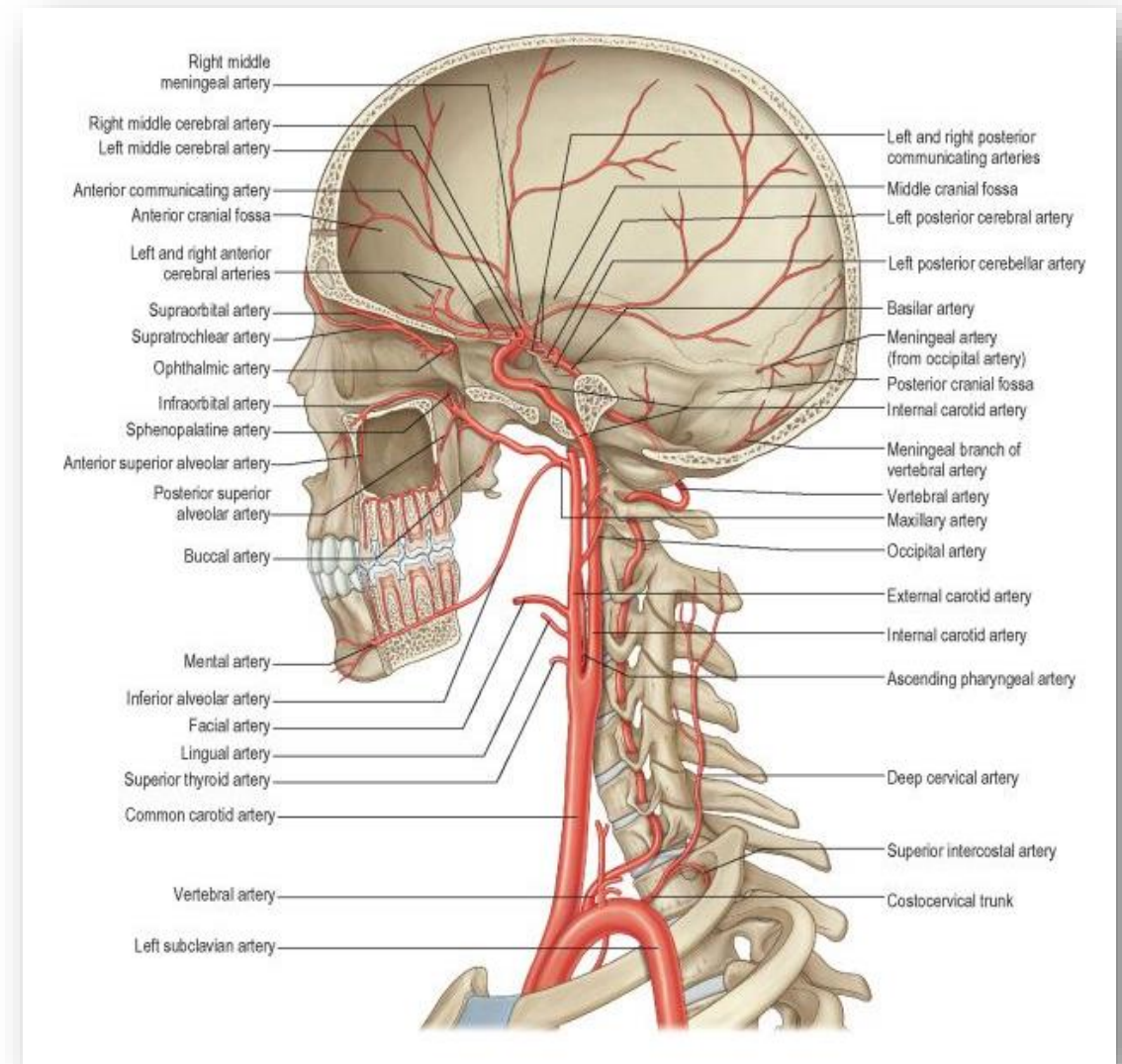
Arterial supply of head & neck

Major source of blood to the head & neck:

Carotid arteries.

Additional arteries:

From branches of the subclavian artery.



Common Carotid Artery (CCA)

Origin:

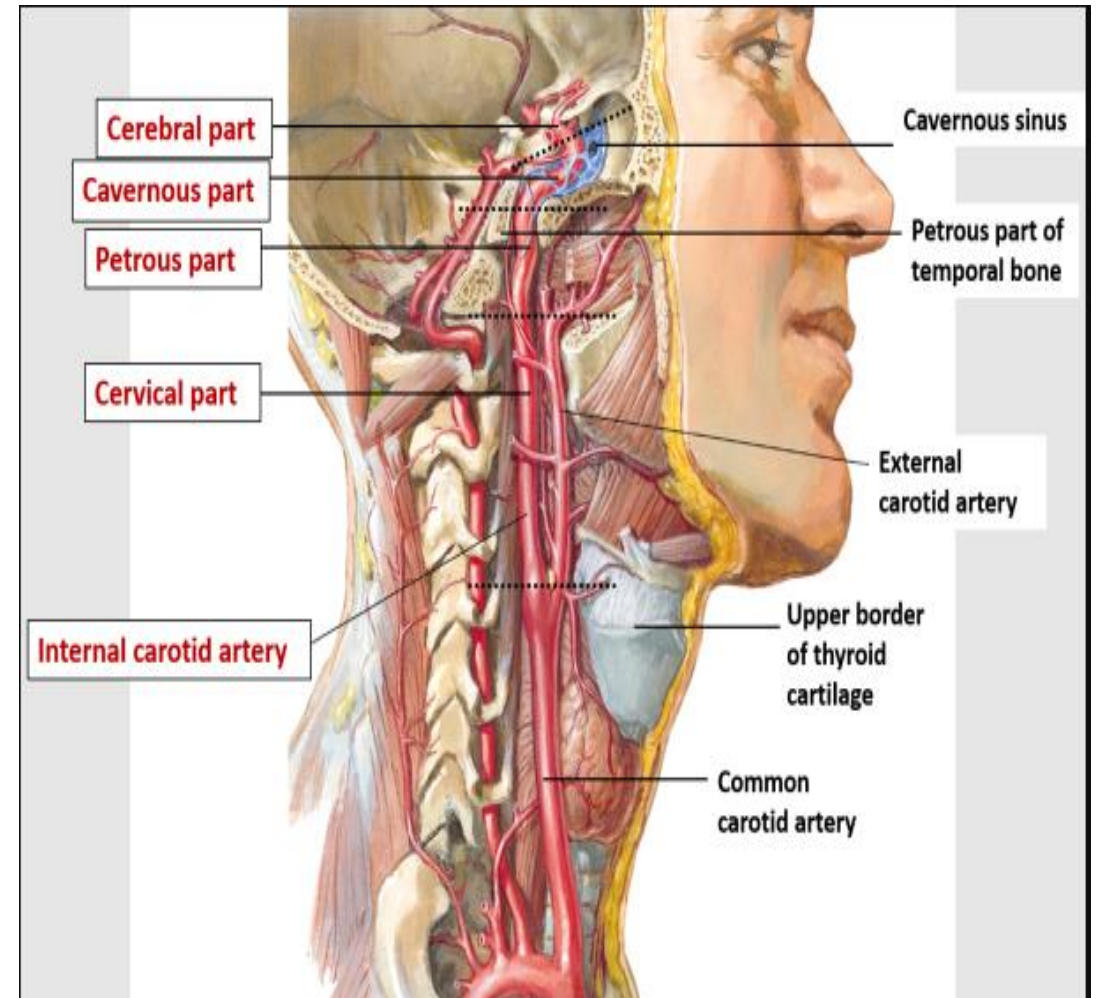
- On the right side; Brachiocephalic artery.
- On the left side; Arch of the aorta.

Course:

- They ascend upward through the neck (at corresponding side).
- Left common carotid artery has also thoracic part.

End:

- It ends **at the level of the upper border of the thyroid cartilage of the larynx, where it divides into external and internal carotid arteries.**



Relations of CCA:

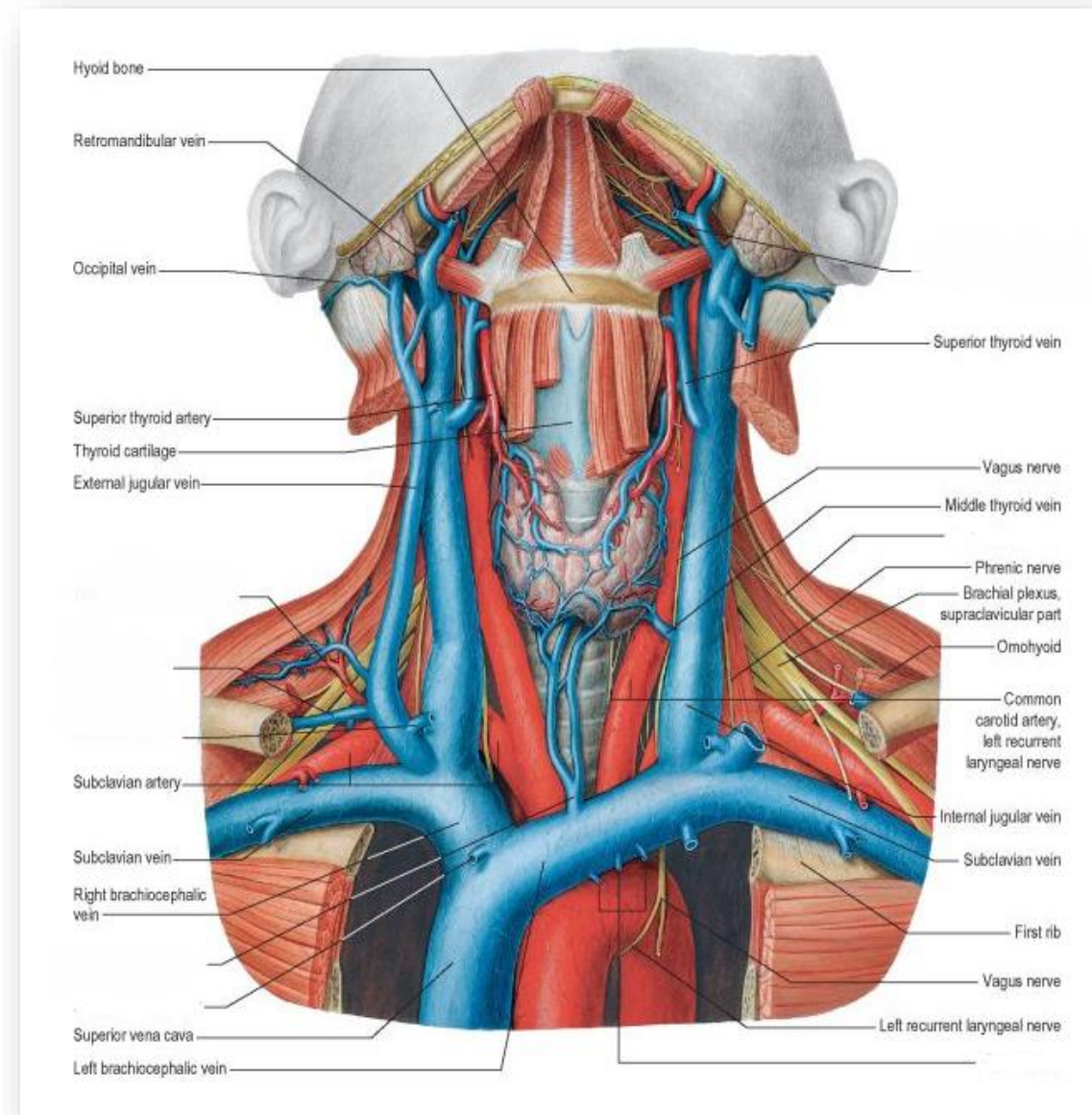
- Each artery lies within the carotid sheath with the internal jugular vein and the vagus nerve.

Anterolaterally:

- Its lower part**, is sited **deeply** covered by sternocleidomastoid & infrahyoid muscles.
- Its upper part**, it is more **superficial** (covered only by skin and fascia).

Posteriorly:

- Transverse processes of the fourth to sixth cervical vertebrae and the related muscles.



Medially:

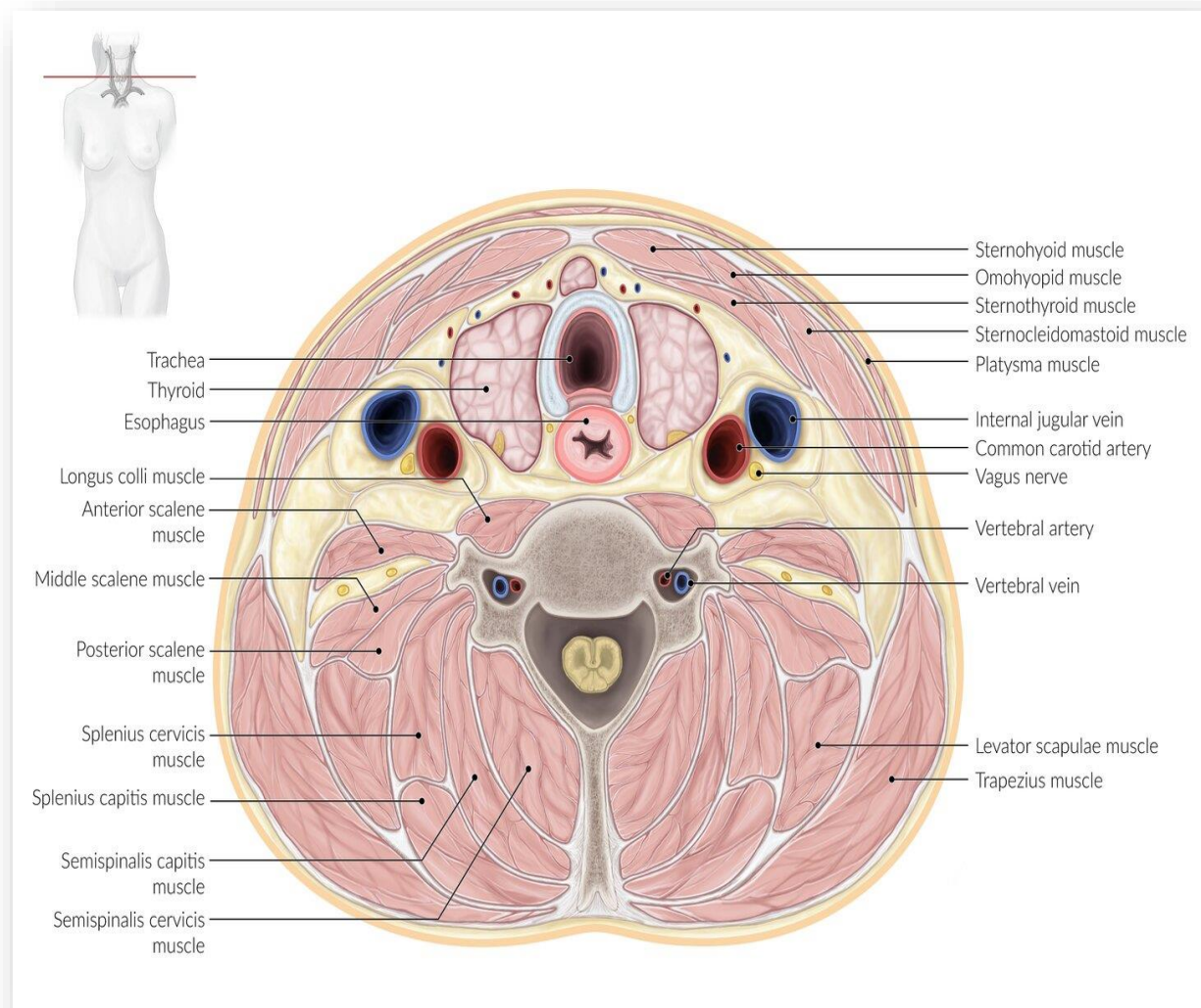
- Larynx & pharynx above.
- Trachea & esophagus below.
- Lobe of the thyroid gland.

Laterally:

- Internal jugular vein.

Posterolaterally:

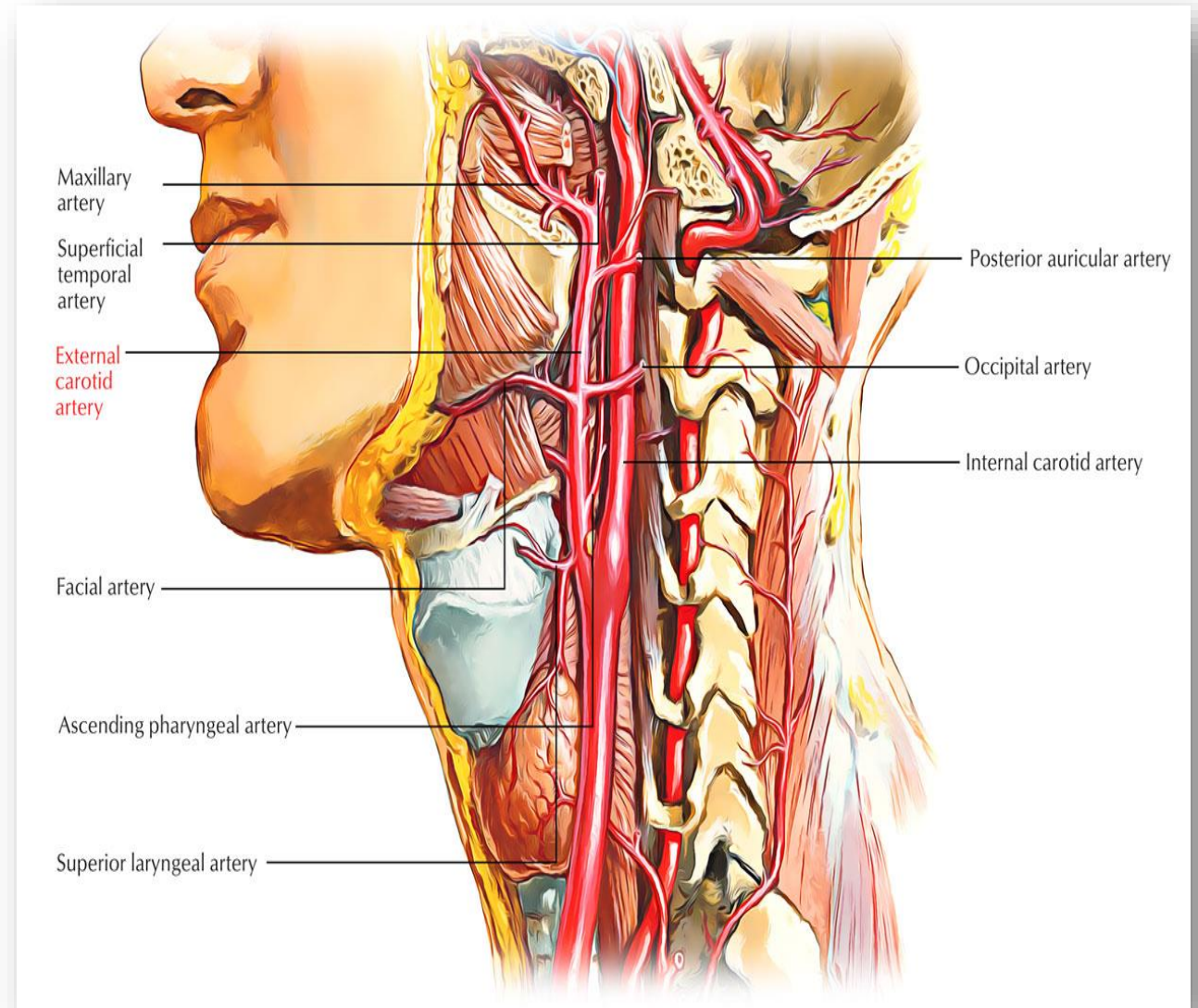
- Vagus nerve.



Branches of CCA:

It gives only its two terminal branches:

- **External carotid artery.**
- **Internal carotid artery.**



External Carotid Artery (ECA)

Begins:

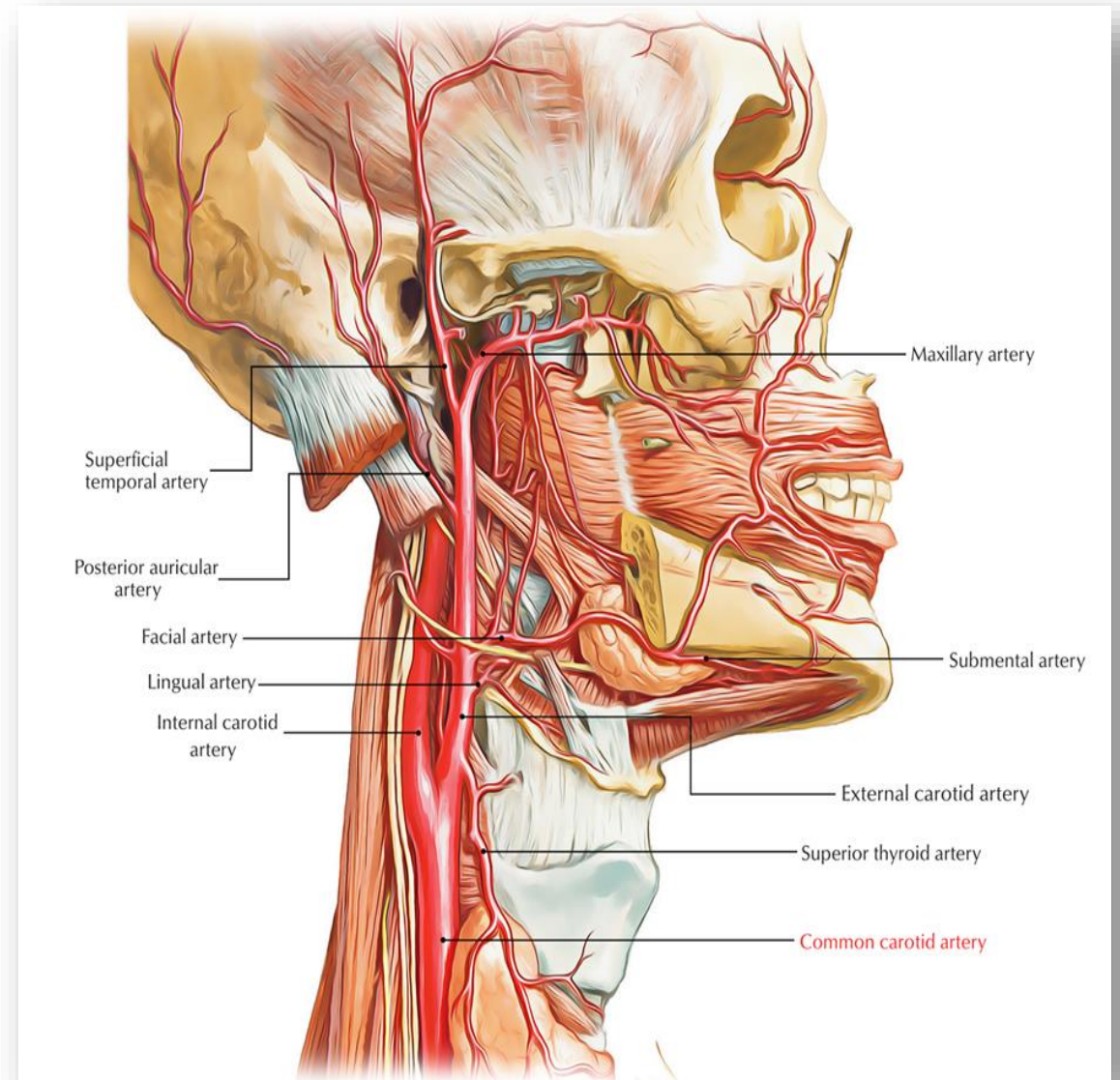
- At the level of the upper border of the thyroid cartilage from CCA.

Course:

- It **ascends upward** through the **carotid triangle of the neck**.
- Then through the **parotid gland** (between the mastoid process & the ramus of the mandible).

Terminates:

- In the **parotid gland, behind the neck of the mandible** by **dividing into** the terminal branches **superficial temporal and maxillary arteries**.

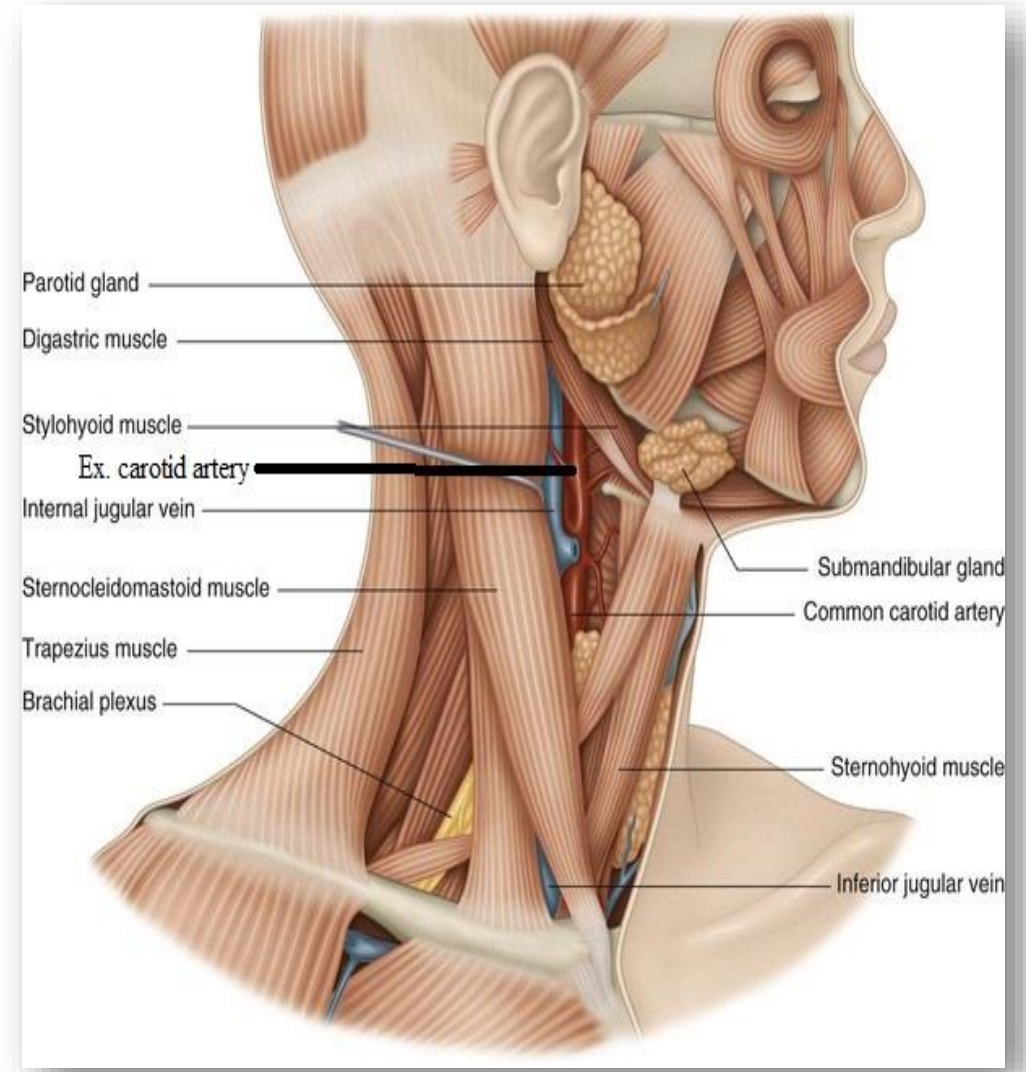


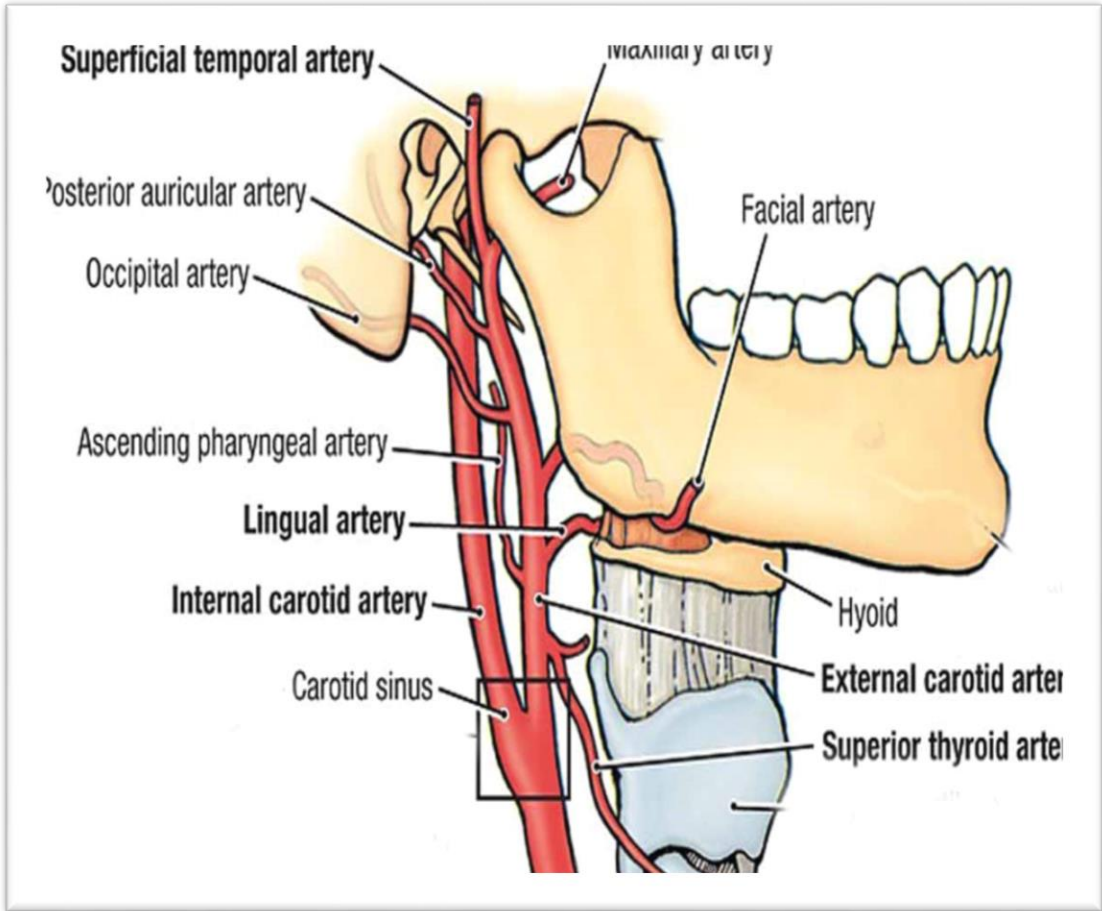
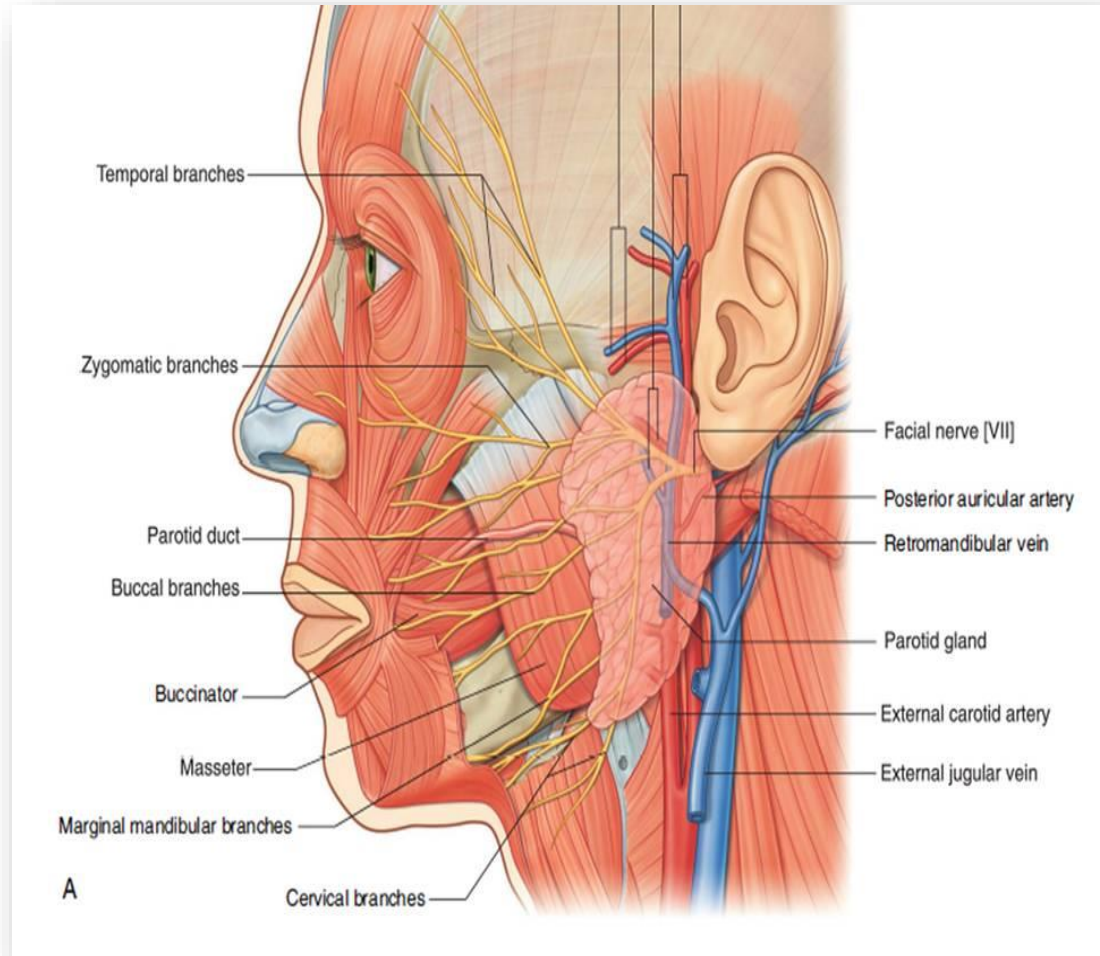
Relations of the ECA:

- Superficial to it while it is in the carotid triangle:
 - Skin and cervical fascia.
 - Anterior margin of sternocleidomastoid muscle.
- **Leaving the carotid triangle it is crossed by** the posterior belly of digastric muscle.
- Its upper part lie within the parotid gland.

Medial relations:

- Pharynx.
- ICA medial to its upper part.
- The styloid process & its attached structures intervene between the ICA is deep to it and the ECA superficial to it.





Branches of the external carotid artery:

1-Superior thyroid artery

2-Lingual artery

3-Facial artery

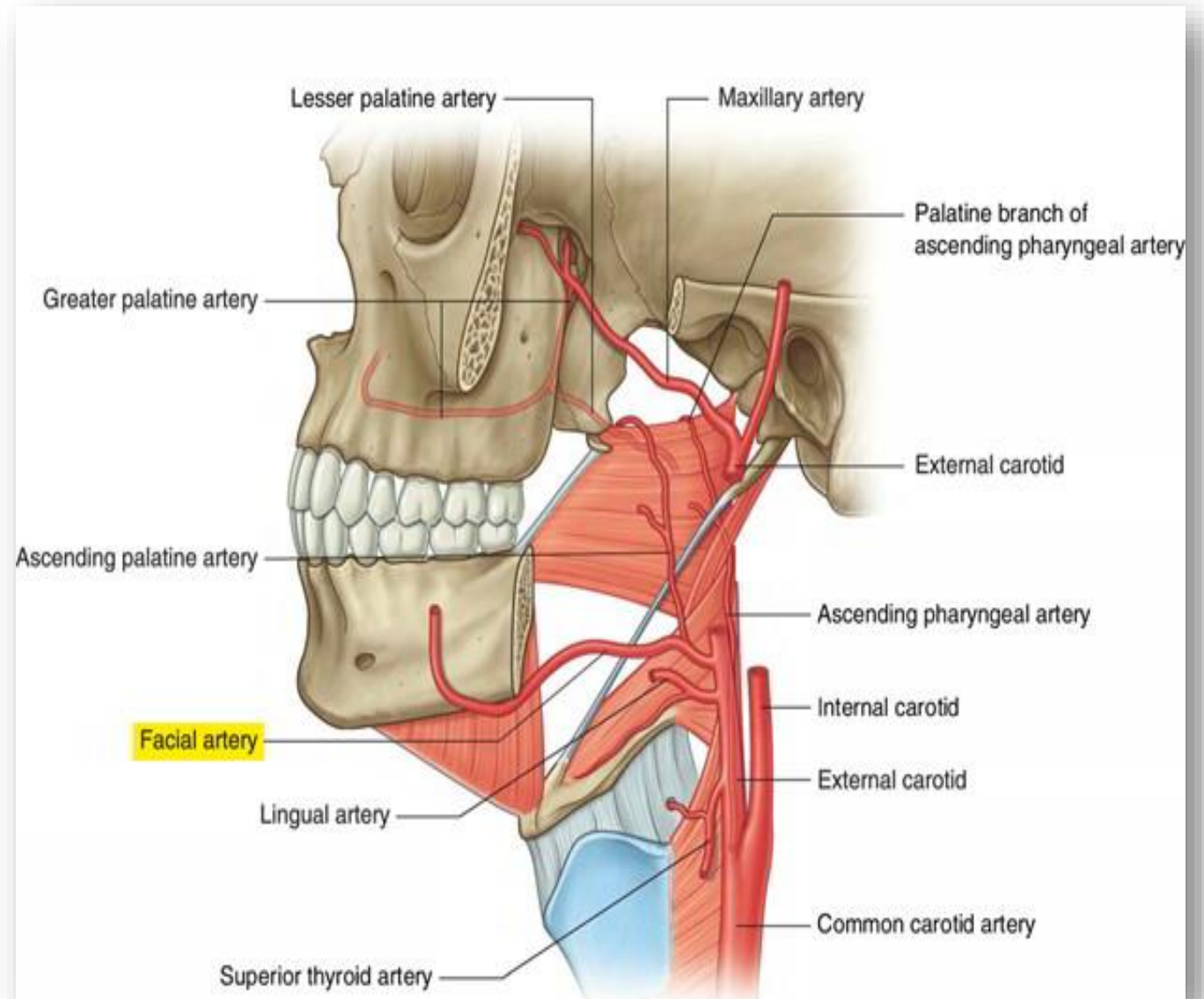
4-Posterior auricular artery

5-Occipital artery

6-Ascending pharyngeal artery

7-Superficial temporal artery

8-Maxillary artery

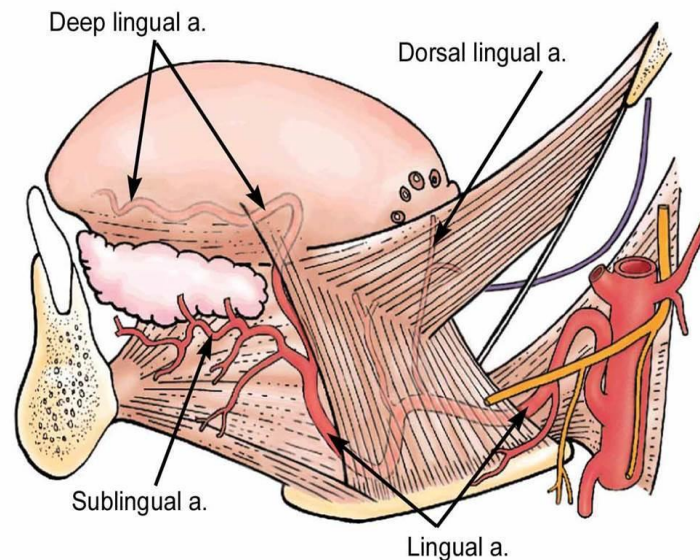
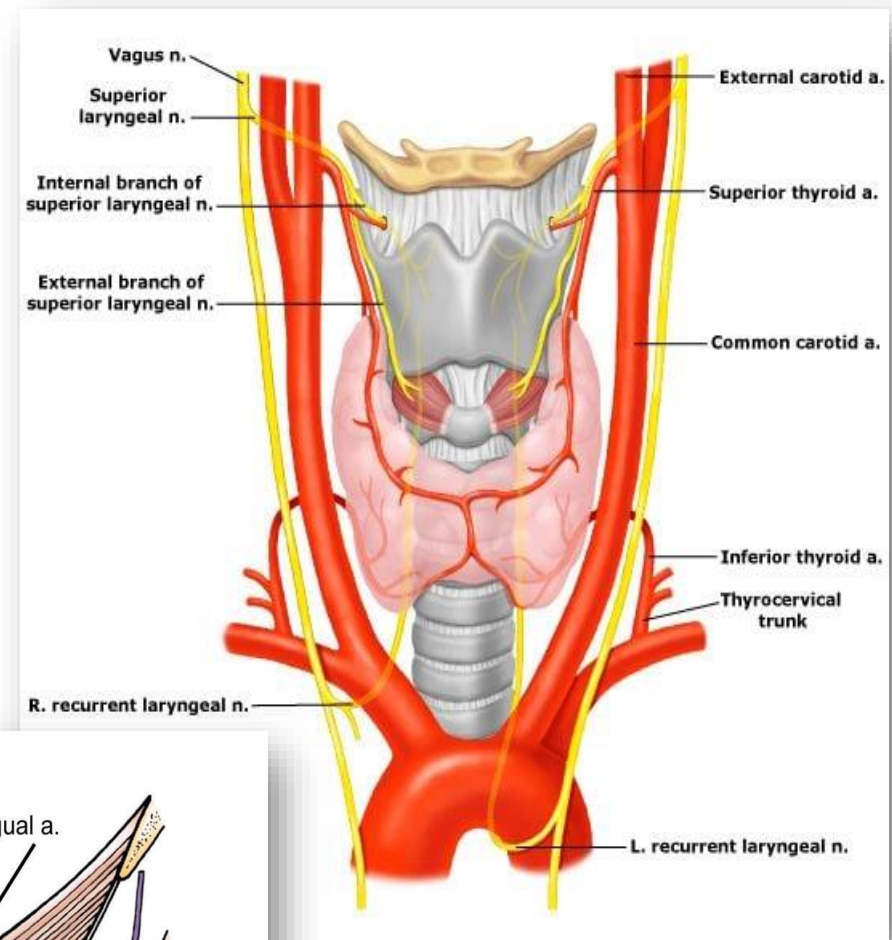


Superior thyroid artery:

- Is the first branch **arises** from the ECA just below the level of the greater cornu of the hyoid bone.
- It **descends** to reach the apex of the lobe of the thyroid gland.

Lingual artery:

- It **arises** opposite the tip of the greater cornu of the hyoid bone.
- **Provides** the chief blood supply to the tongue and the floor of the mouth.



Facial artery:

- It arises at a level immediately above the greater cornu of the hyoid bone.
- It hooks the lower border of the mandible and turns upwards at the antero-inferior angle of the masseter.
- To enter the face.
- It has tortuous course.

Its branches in the face:

- Inferior labial artery.
- Superior labial artery.
- Angular artery.

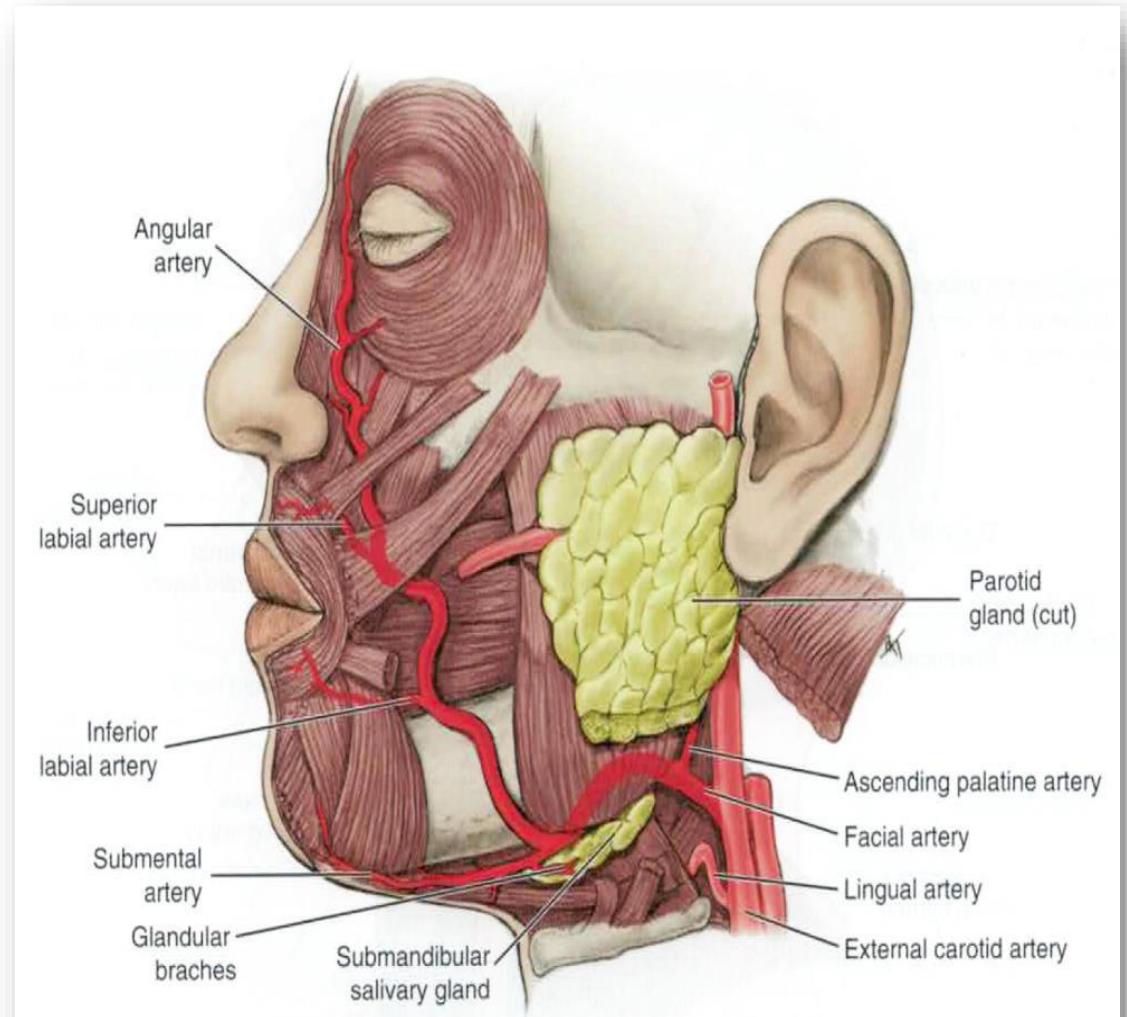


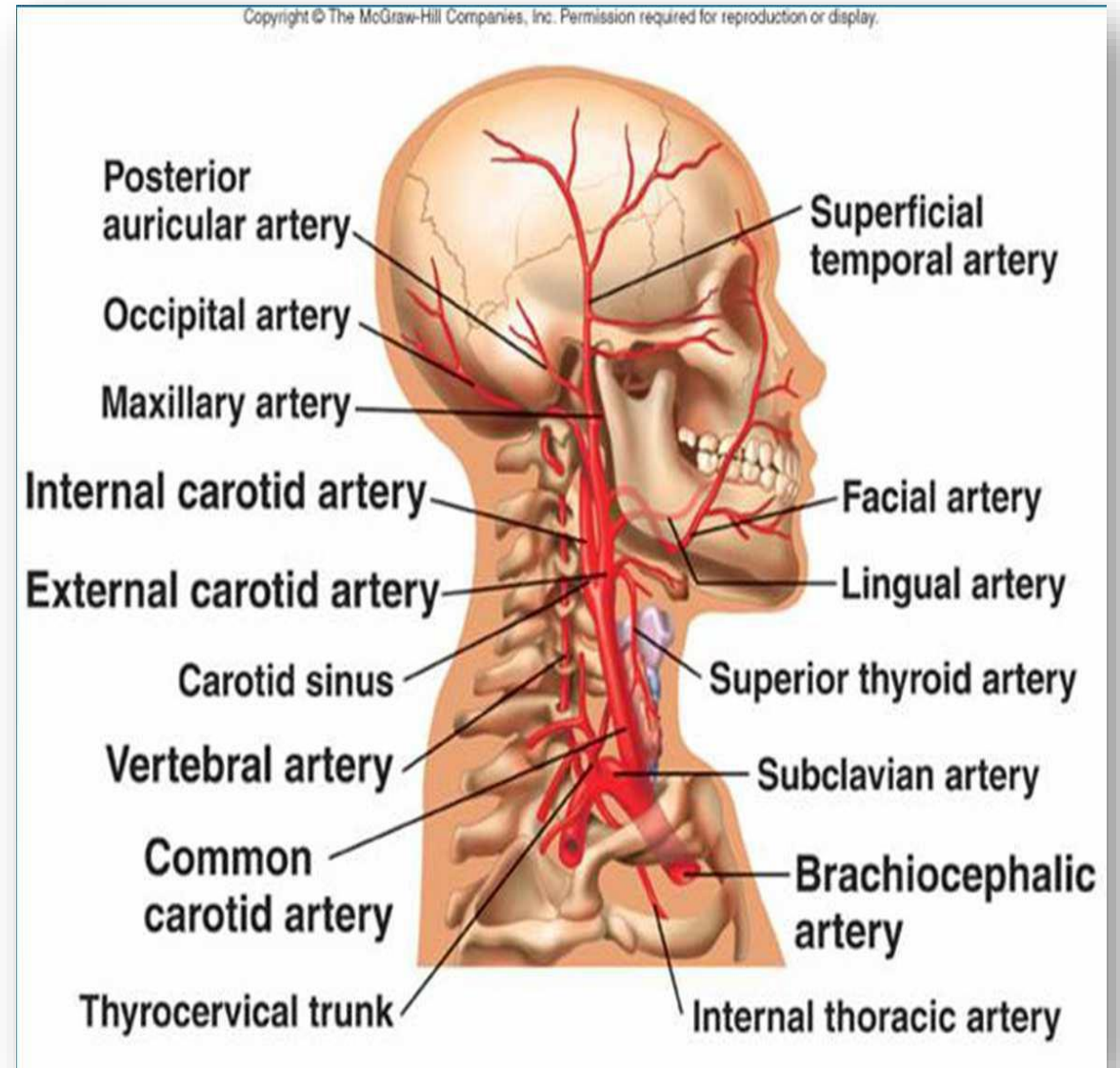
FIGURE 6-6 Pathway of the facial artery.

Occipital artery:

- It **passes** backwards, upward to supply the posterior portion of the scalp.

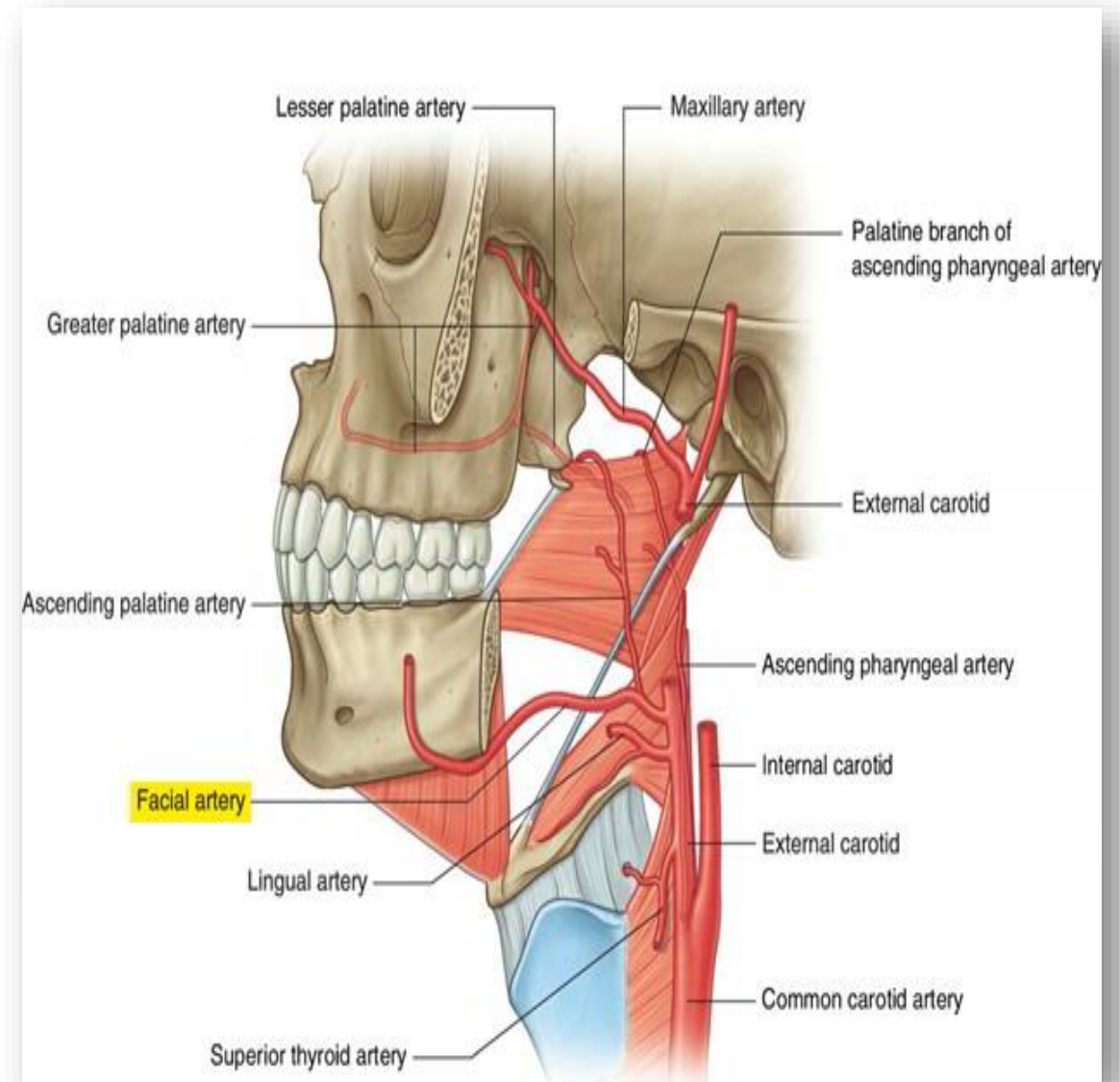
Posterior auricular:

- It **passes** backwards, upward, supplies the auricle and the scalp.



Ascending pharyngeal artery:

- Is the smallest branch of the external carotid.
- **Ascends** along the pharyngeal wall and supplies it.

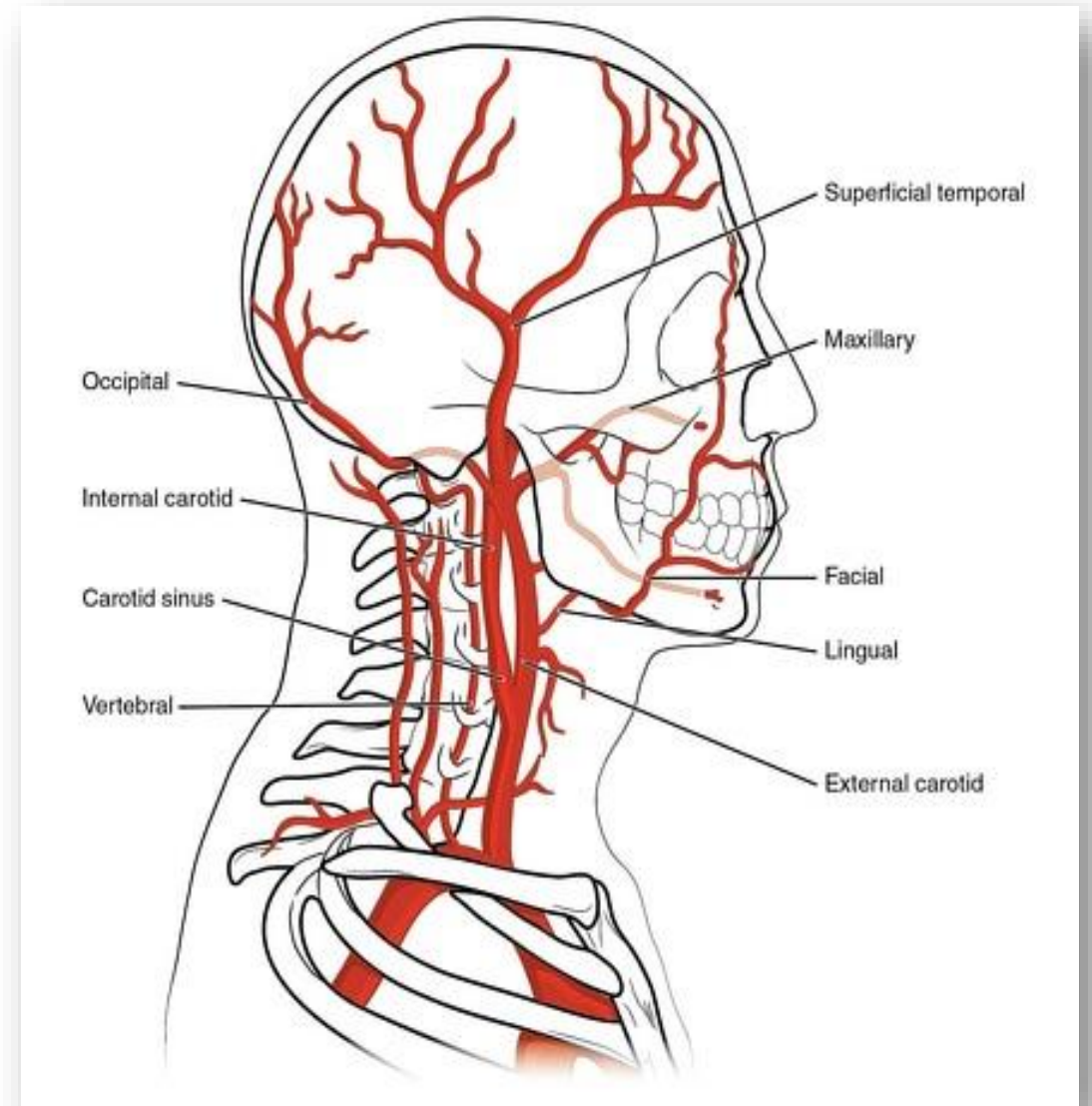


Superficial temporal artery:

- **Ascends** over the zygomatic arch, it supplies the scalp.

Maxillary artery:

- It runs forward **medial to the neck of the mandible.**
- Then passes through **the infratemporal fossa.**
- **Then enters the pterygopalatine fossa.**
- **It supply the jaws, Muscles of mastication, the nose& the palate.**



Internal Carotid Artery (ICA)

Beginning:

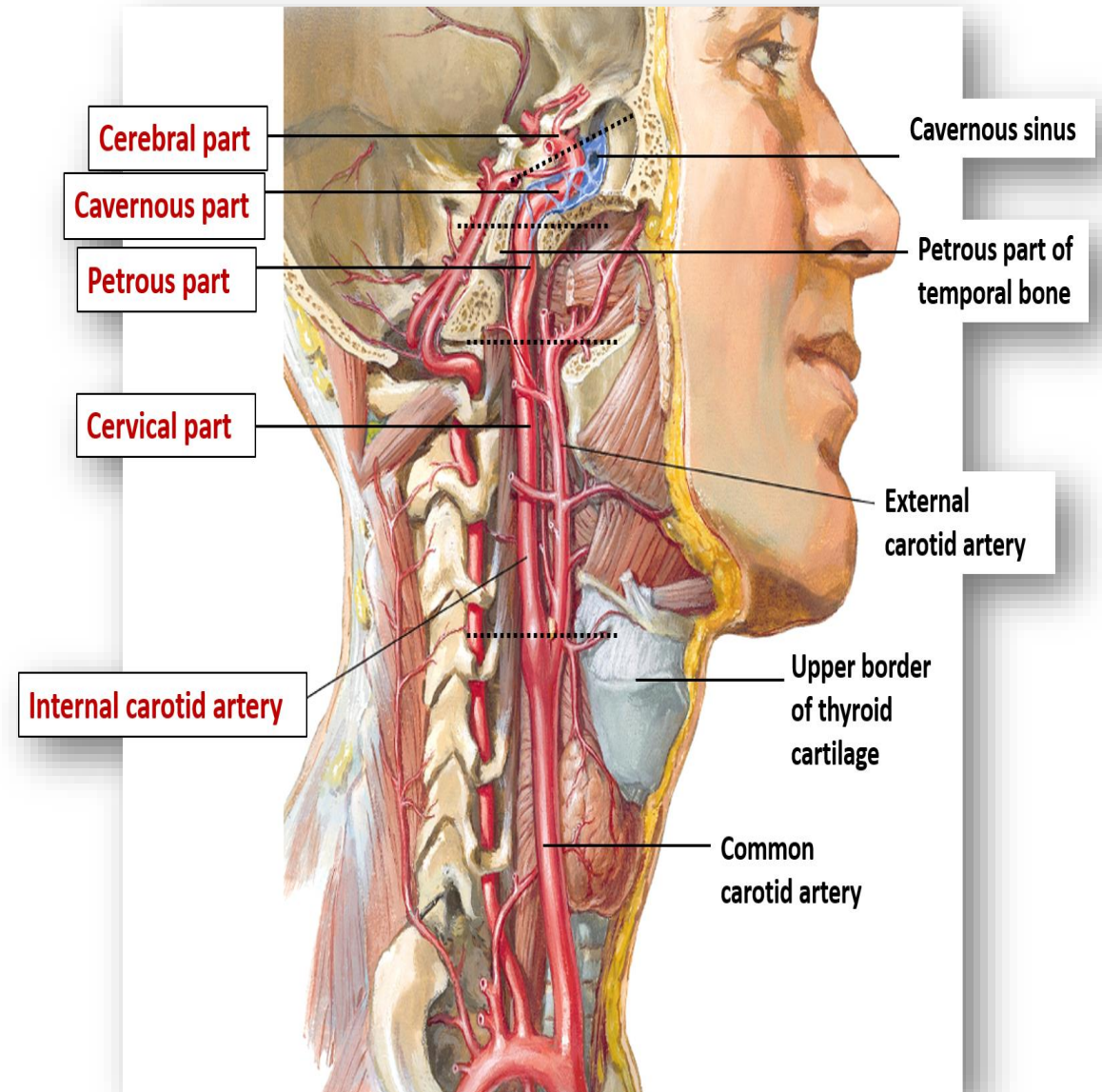
- It begins at the bifurcation of the CCA at the level of the upper border of the thyroid cartilage.

It has four parts;

- Cervical.
- Petrous.
- Cavernous through cavernous sinus.
- Cerebral parts.

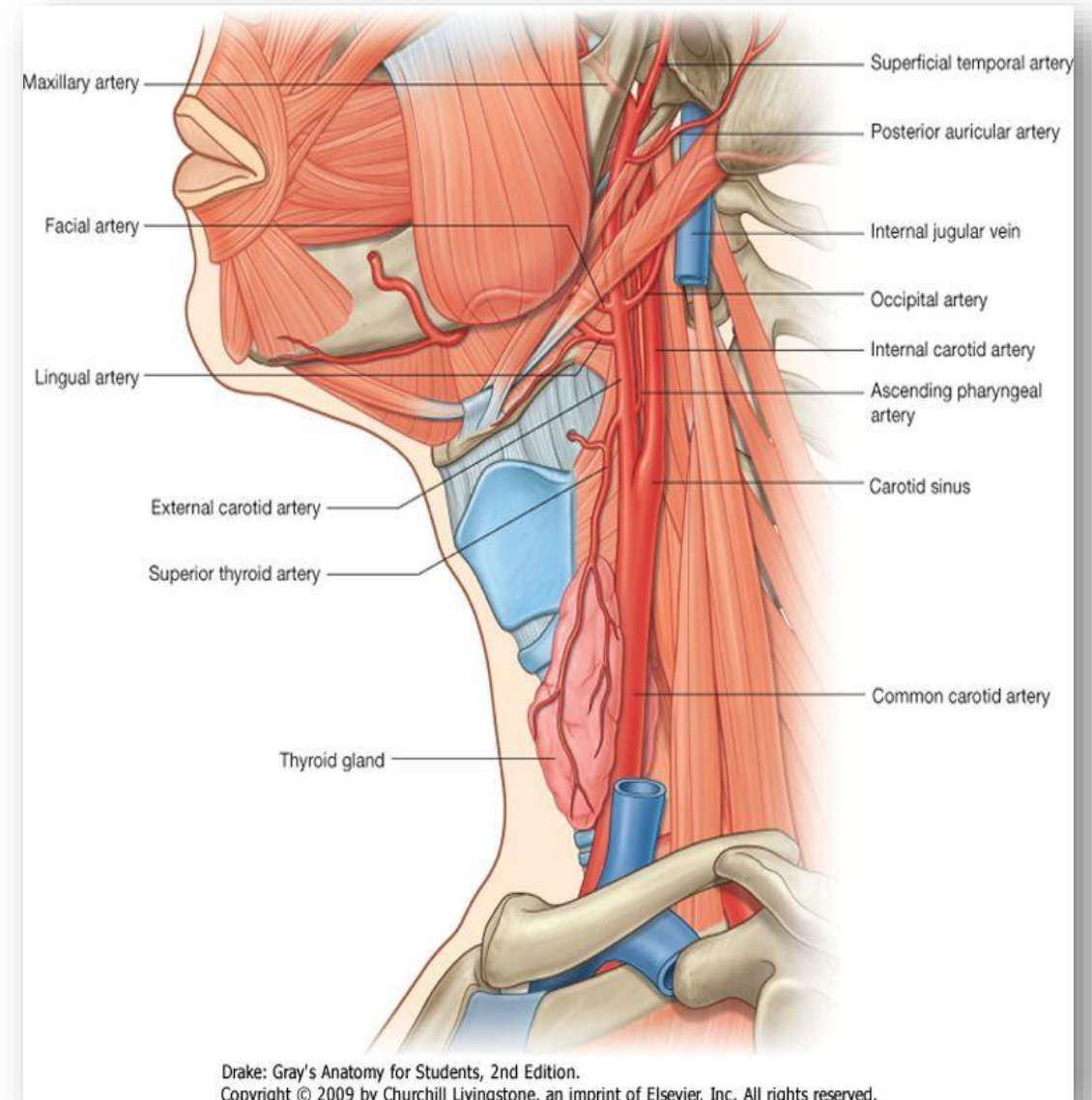
End:

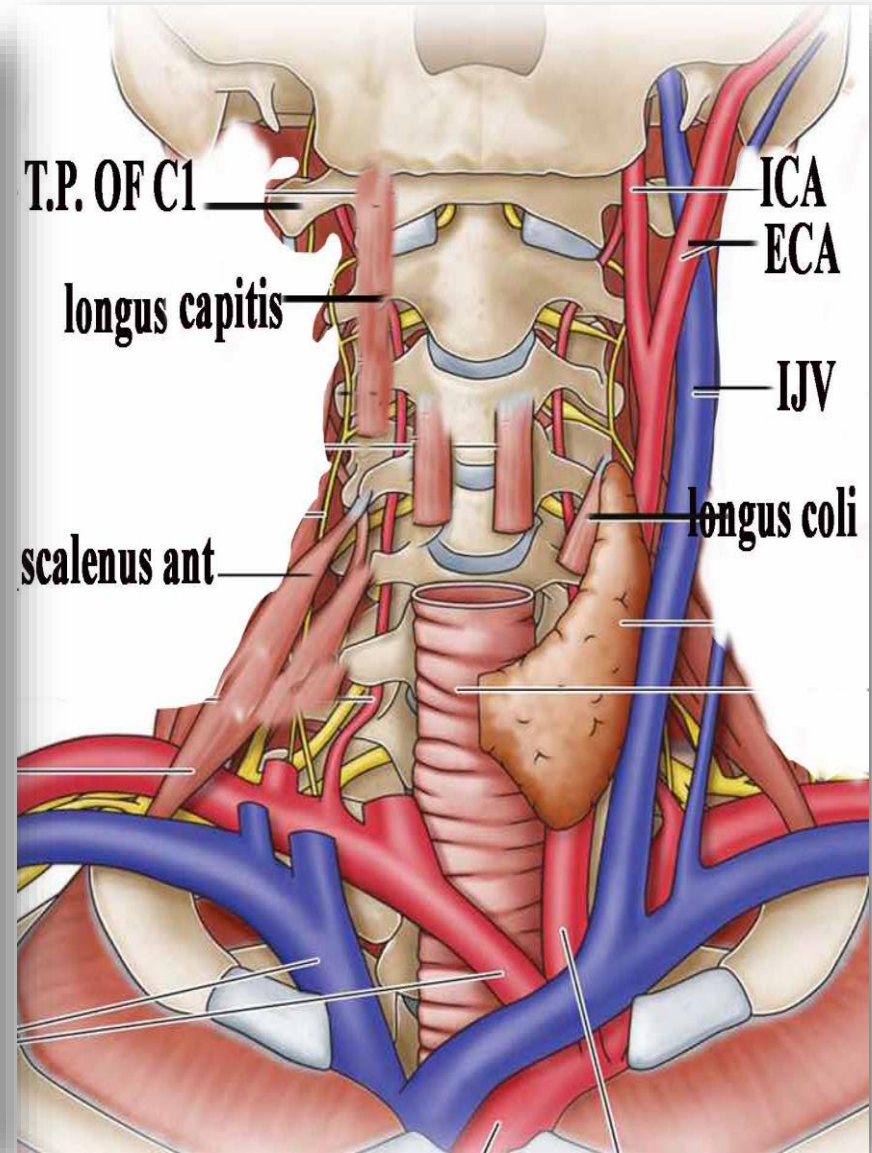
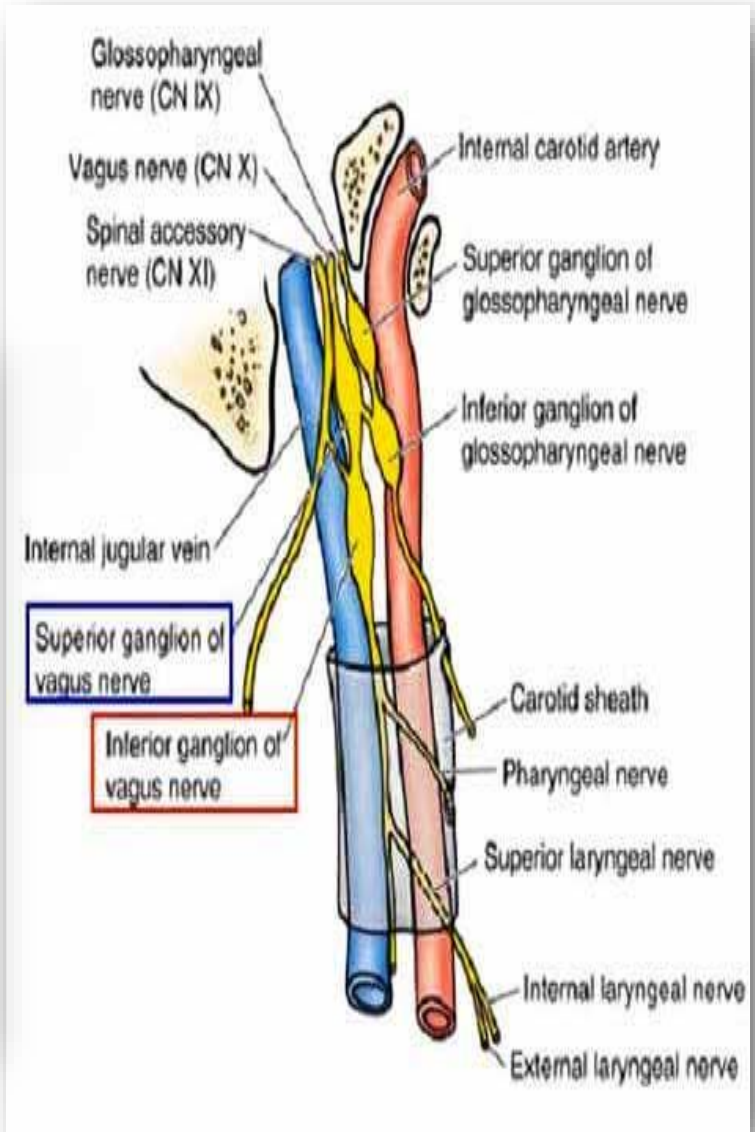
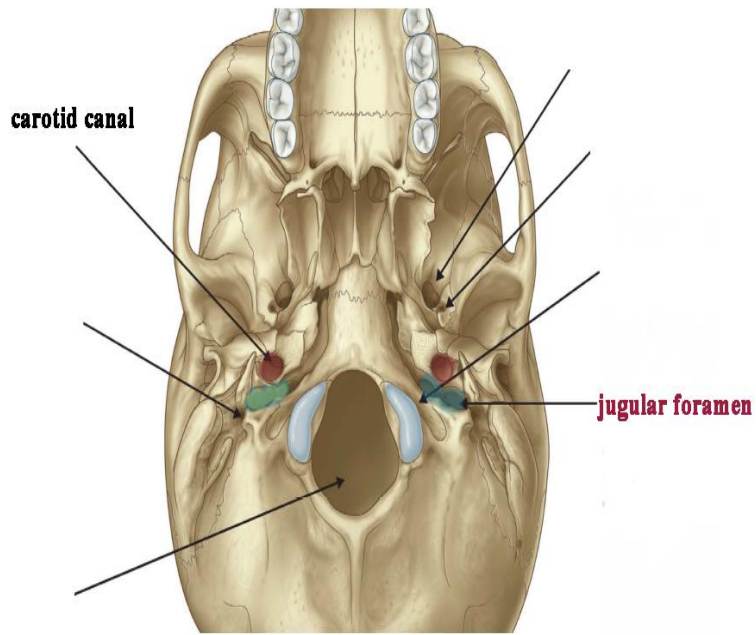
- The cerebral part terminates by dividing into the **Anterior & Middle cerebral arteries.**



Course & relations of the ICA:

- The artery **ascends in the neck** **within the carotid sheath** with the internal jugular vein and vagus nerve are lateral to it.
- **Medially:** Pharynx.
- **Posteriorly:** Transverse processes of the upper three cervical vertebrae.
- **It leaves the neck** by **passing through** the carotid canal of the skull to enters the cranial cavity.





Branches of the ICA:

Cervical part:

- Has no branches in the neck. (ECA easily distinguishable).

Petrous part:

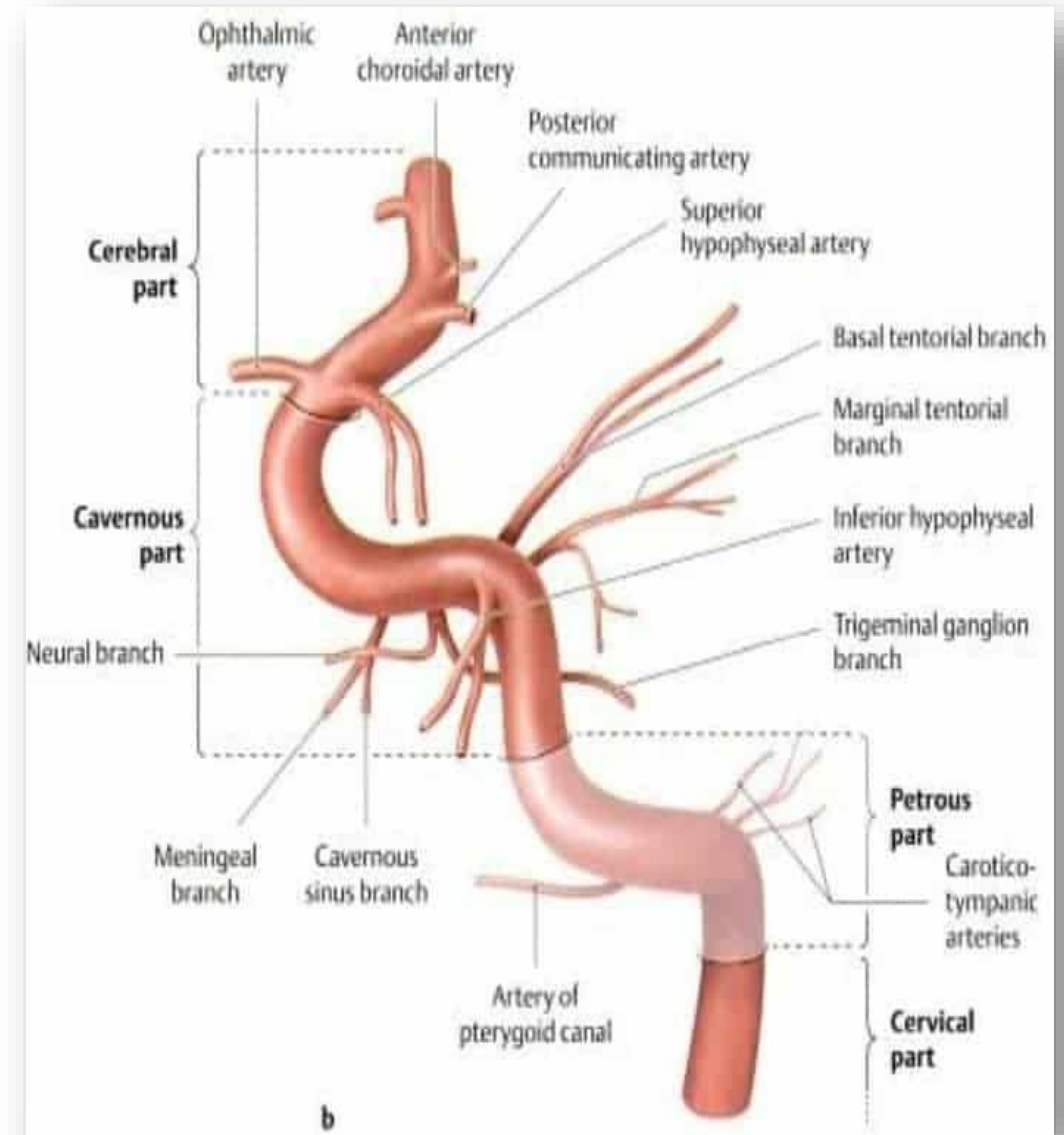
- Caroticotympanic artery.

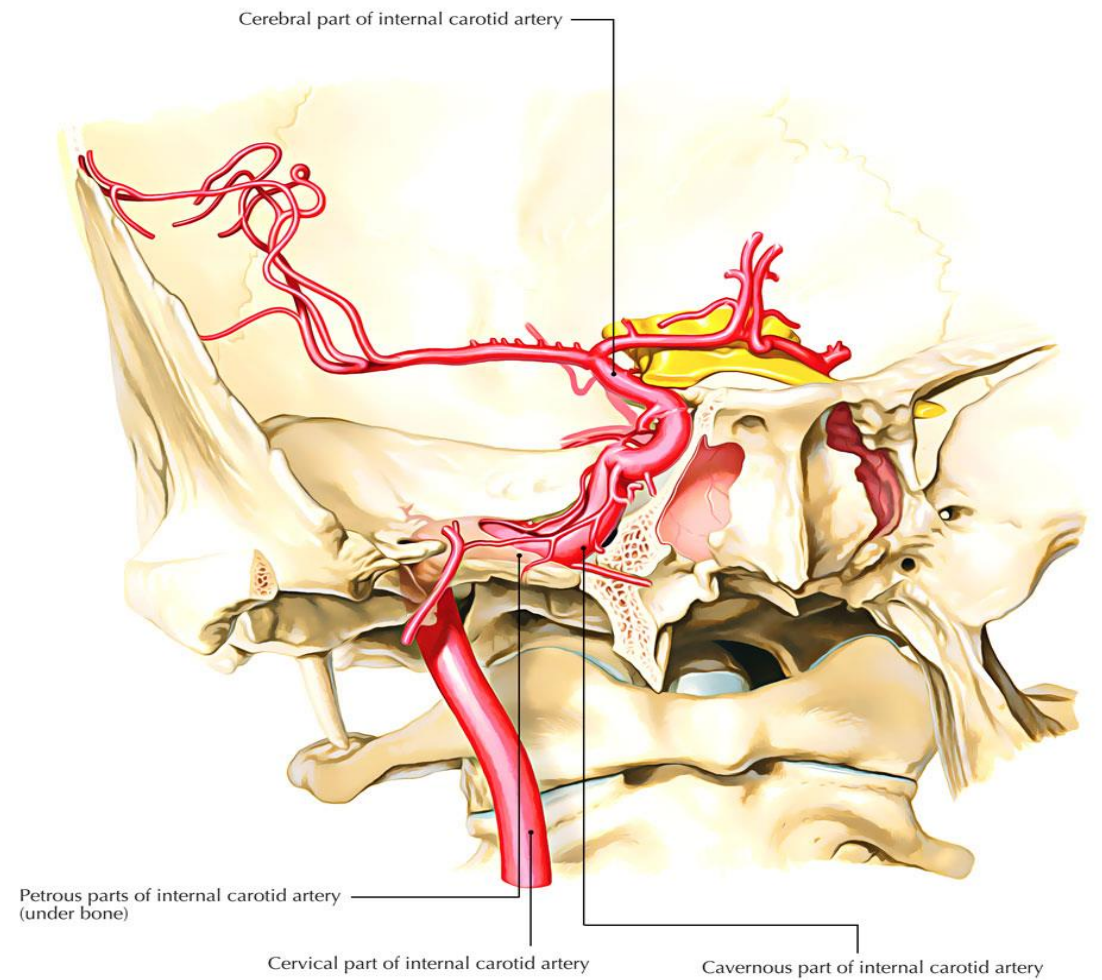
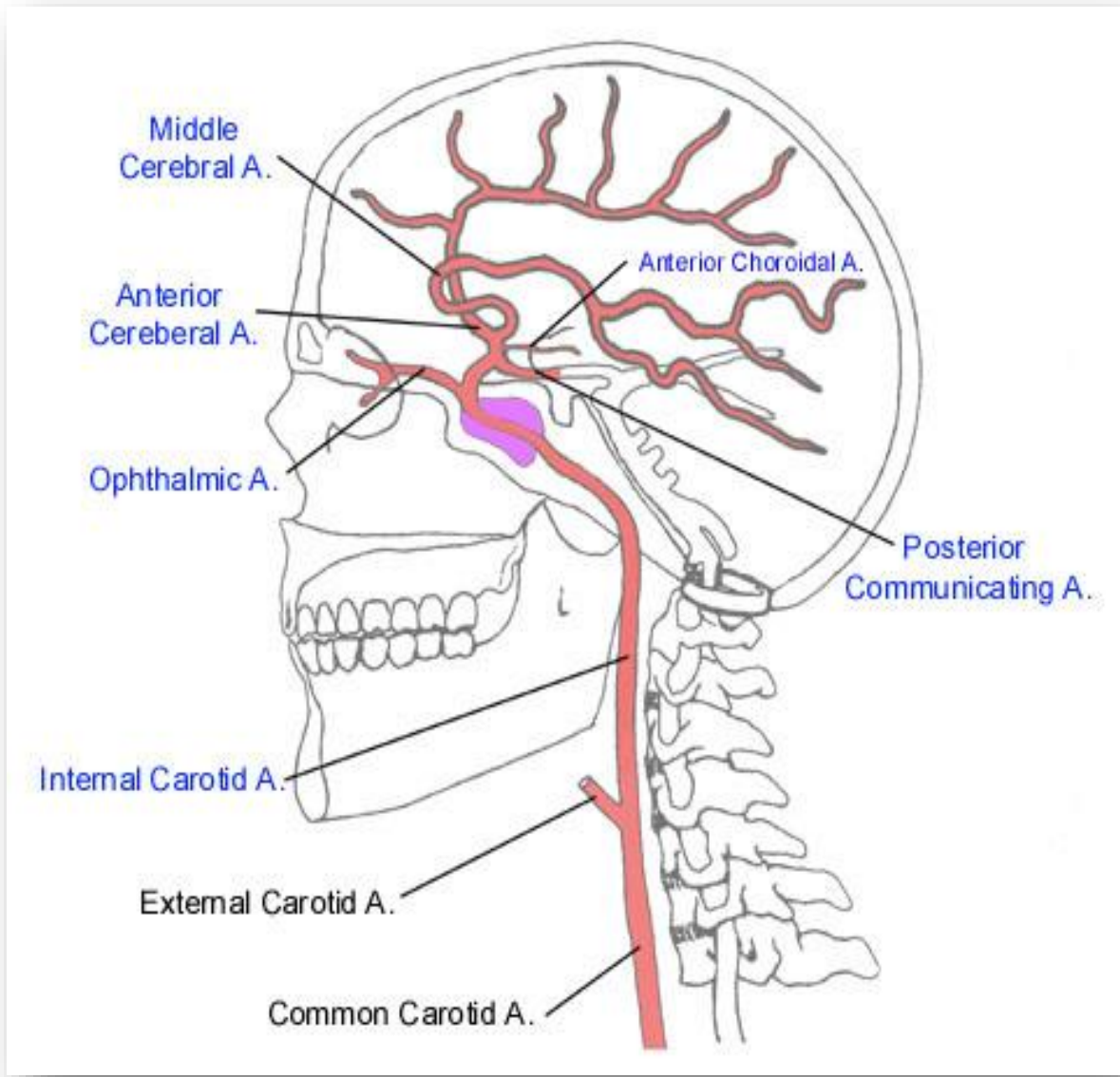
Cavernous part:

- Cavernous & hypophysial branches.

Cerebral part:

- Its terminal branches are the anterior and middle cerebral arteries.



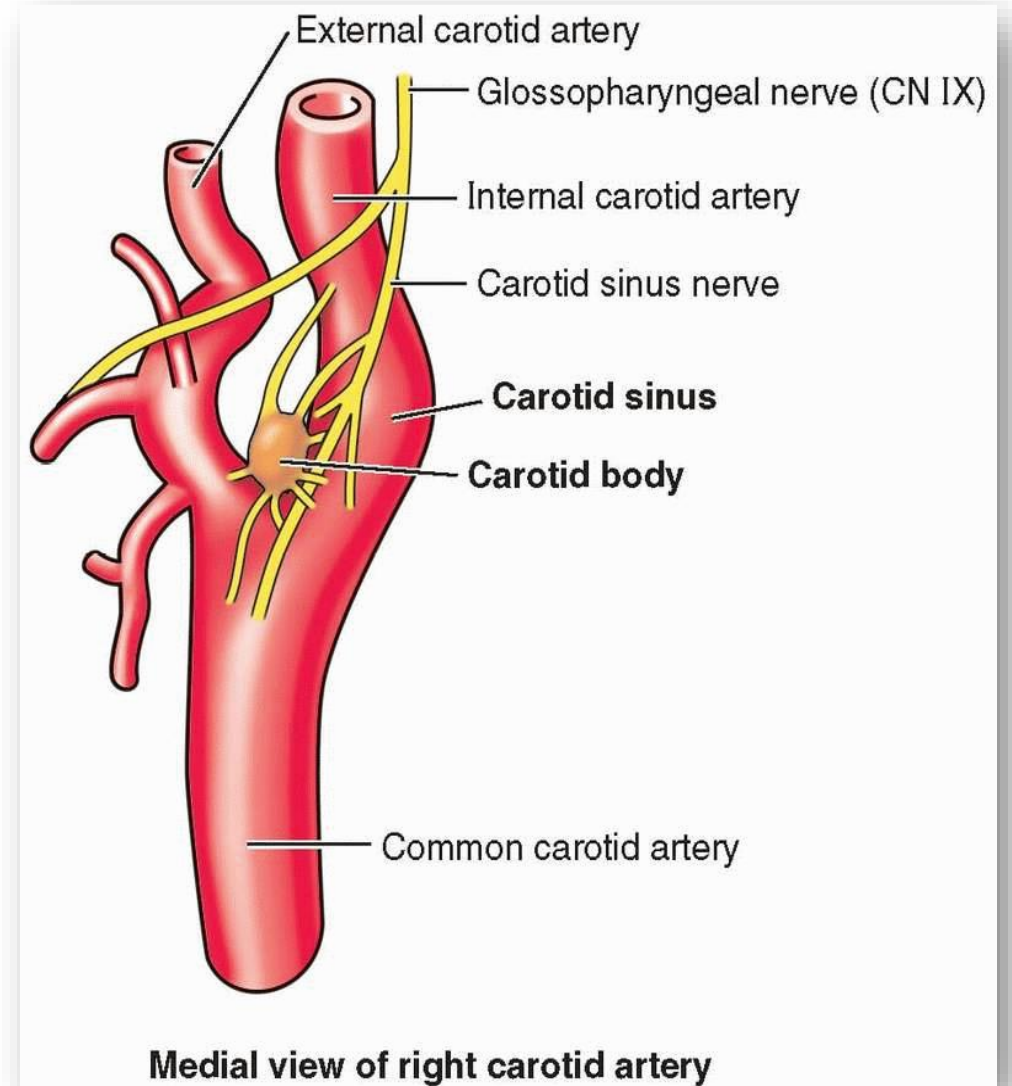


Carotid Sinus:

- **Site:** at the terminal part of the CCA or at the beginning of the ICA as a **localized dilatation**.
- contains numerous nerve endings derived from the **glossopharyngeal nerve**.
- It acts as a **baroreceptor** detect changes in blood pressure.

Carotid Body:

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



Taking carotid pulse:

- A fingertip placed just **beneath** the anterior border of the sternocleidomastoid muscle **at the level of** the superior border of the thyroid cartilage. perceives a powerful arterial pulsation, which represents the termination of the common carotid, the origins of external and internal carotid arteries.



Subclavian artery

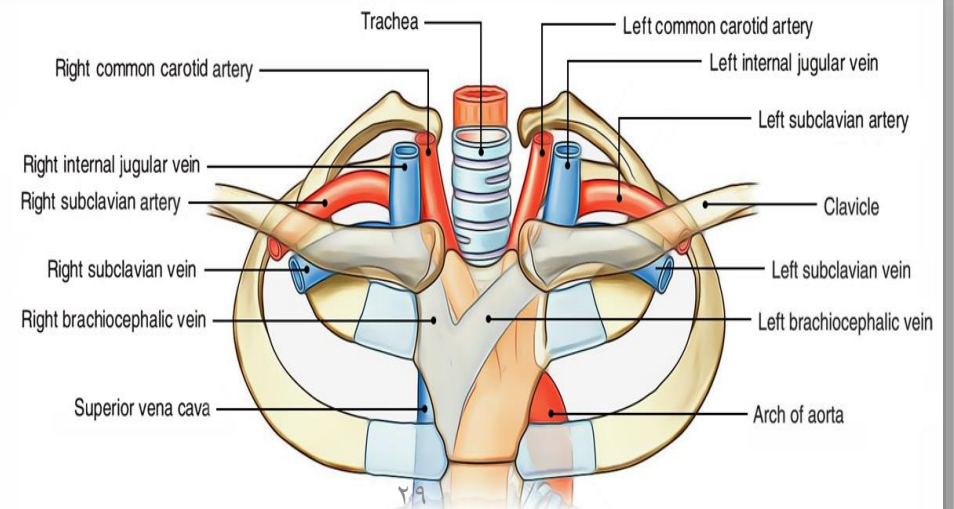
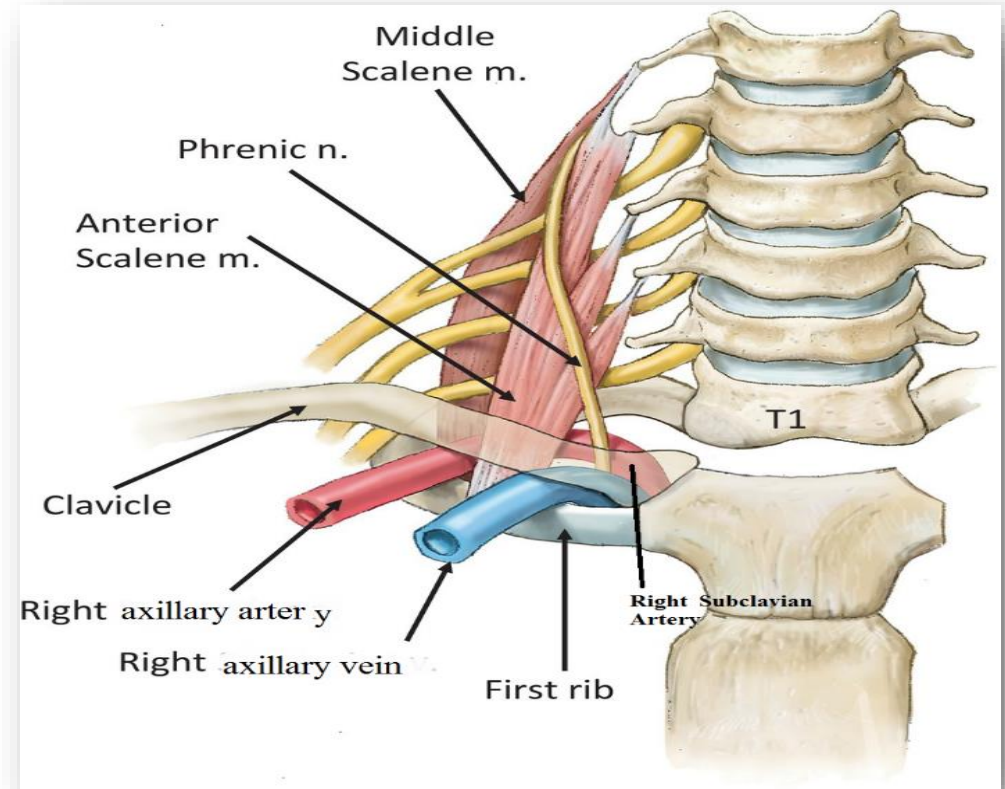
Right Subclavian Artery:

- **Arises from** the brachiocephalic artery.
- **Arches** upward and laterally.
- At the outer border of the first rib, **it becomes** the axillary artery.

Left Subclavian Artery:

- **Arises from** the arch of the aorta.
- Ascends till reaches behind the left sternoclavicular joint then arches laterally.
- It ends in a manner similar to that of the right subclavian artery.

□ The **scalenus anterior muscle** passes anterior to the artery on each side and divides it into three parts.



Branches of the subclavian artery:

First part:

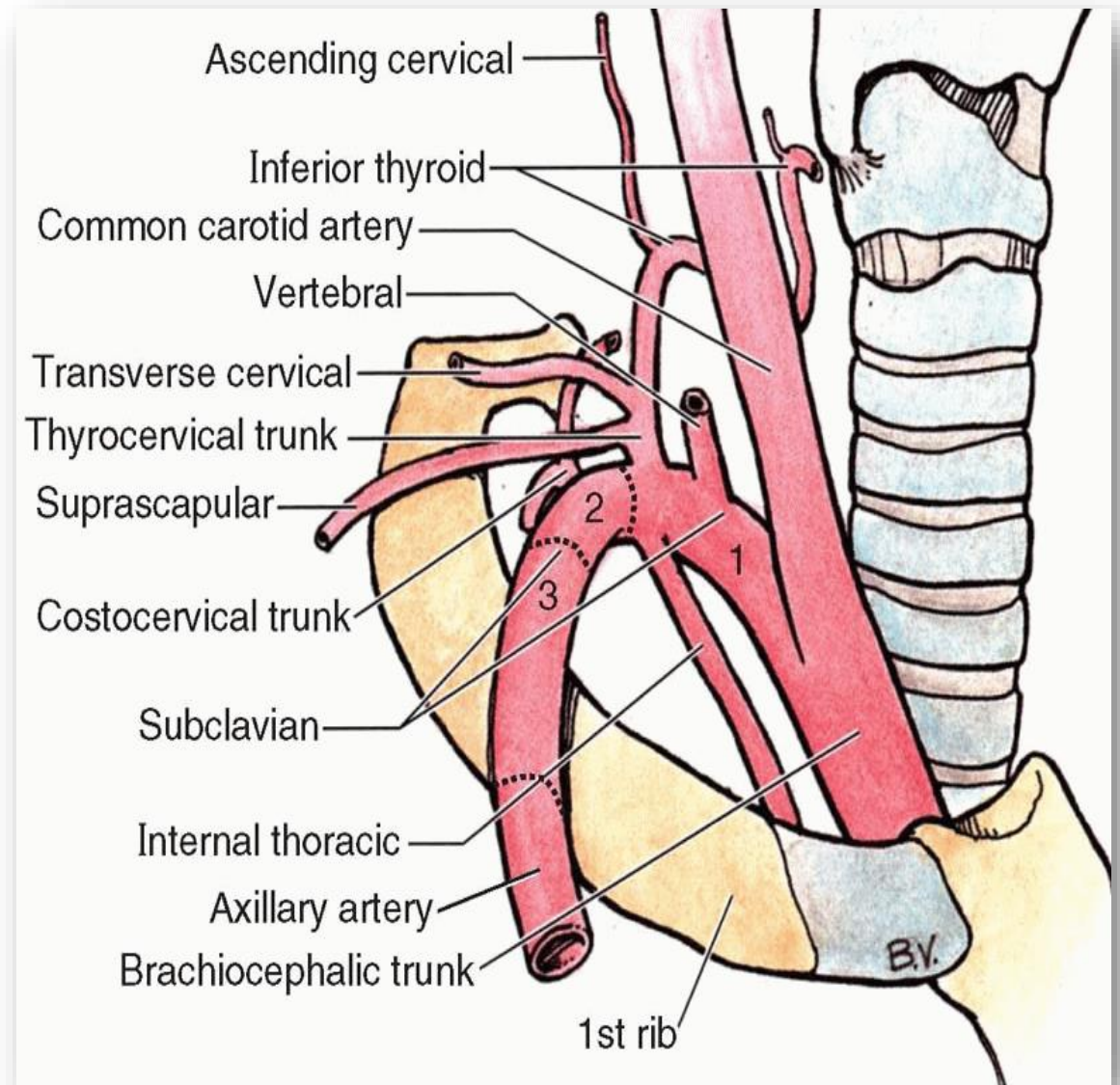
- 1-Vertebral artery
- 2-Thyrocervical trunk.
- 3-Internal thoracic artery.

Second part:

- 1-Costocervical trunk gives deep cervical& superior intercostal arteries.

Third part:

Has no branches.



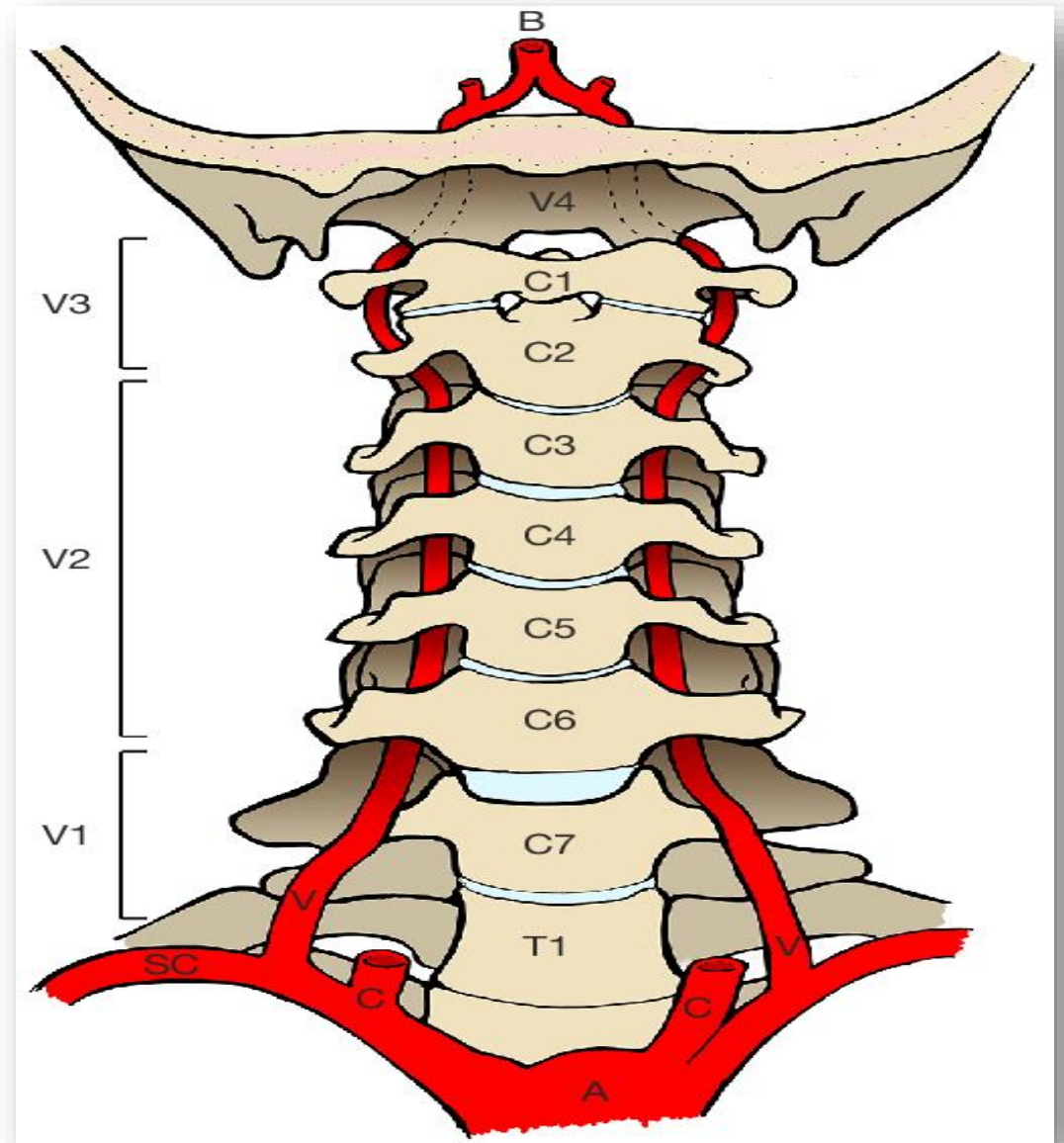
Vertebral artery:

Course:

- It **passes upward through** the foramina of the transverse processes of the cervical vertebrae.
- Then **enters the cranial cavity** via the foramen magnum.

End:

- It **joins its fellow** to form the basilar artery.



Quiz

An angiogram of a 45-year-old man shows an occlusion of the costocervical trunk. This obstruction could produce a marked decrease in the blood flow in which of the following arteries?

- A. Transverse cervical artery.
- B. Superior thyroid artery
- C. Deep cervical artery
- D. Inferior thyroid artery

Name the artery that arises from the external carotid artery opposite the tip of the greater cornu of hyoid bone.

- A) Superior thyroid artery.
- B) Lingual artery
- C) Facial artery
- D) Posterior auricular artery
- E) Occipital artery

