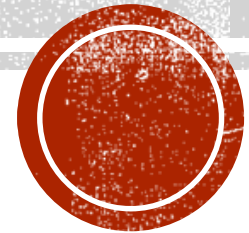


ANATOMY OF THE ENDOCRINE GLANDS

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Palestine Faculty of Medicine
Al-Azhar University Gaza

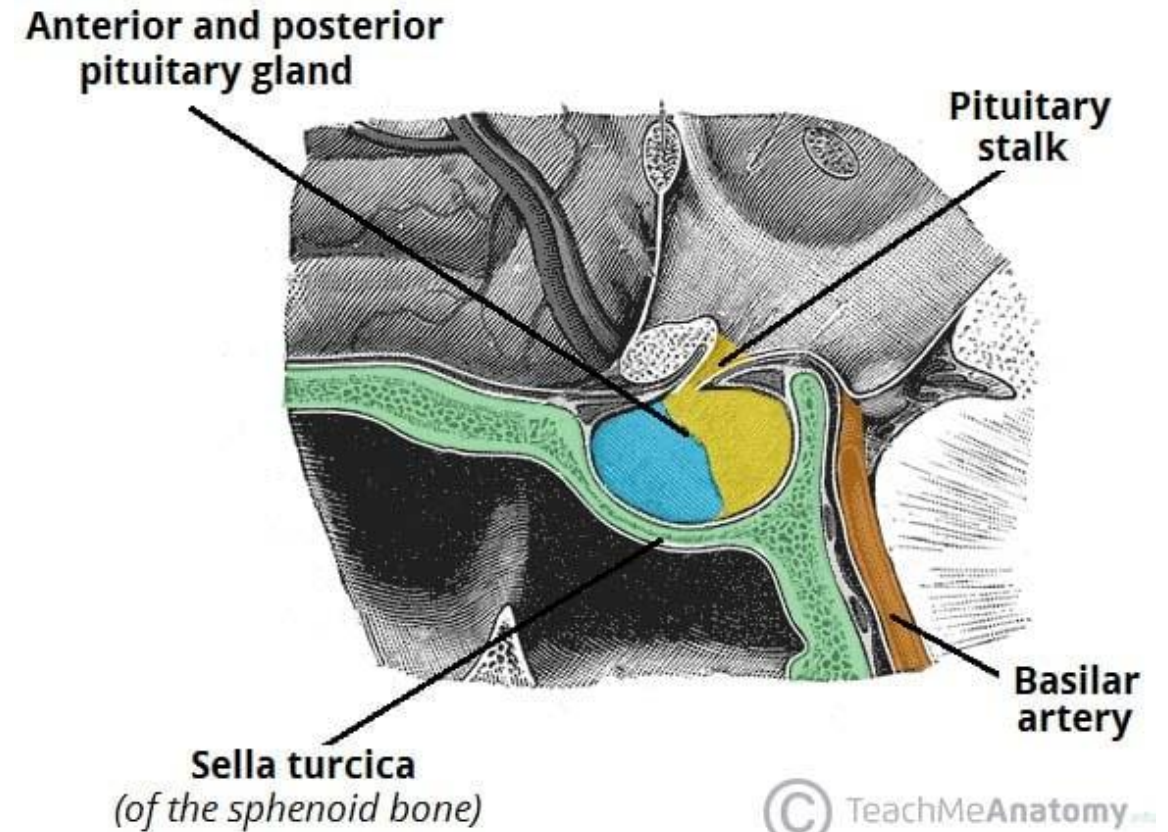
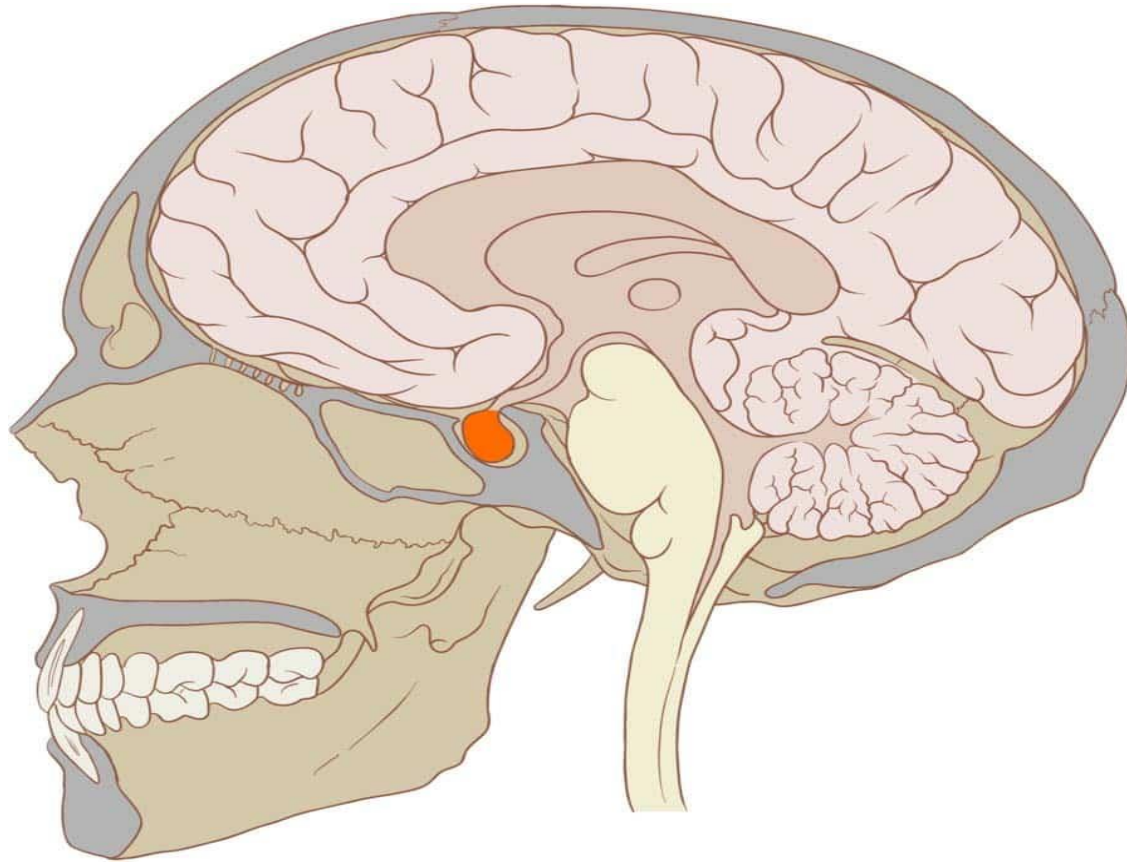


EDUCATIONAL OBJECTIVES

- By the end of this lecture, you're expected to know:
 1. Anatomy and embryology of the pituitary gland.
 2. Anatomy, embryology, related nerve injuries to the thyroid and parathyroid glands.
 3. Anatomy of the adrenal gland



LOCATION OF THE PITUITARY GLAND



<https://teachmeanatomy.info/neuroanatomy/structures/pituitary-gland/>

<https://teachmeanatomy.info/neuroanatomy/structures/pituitary-gland/>

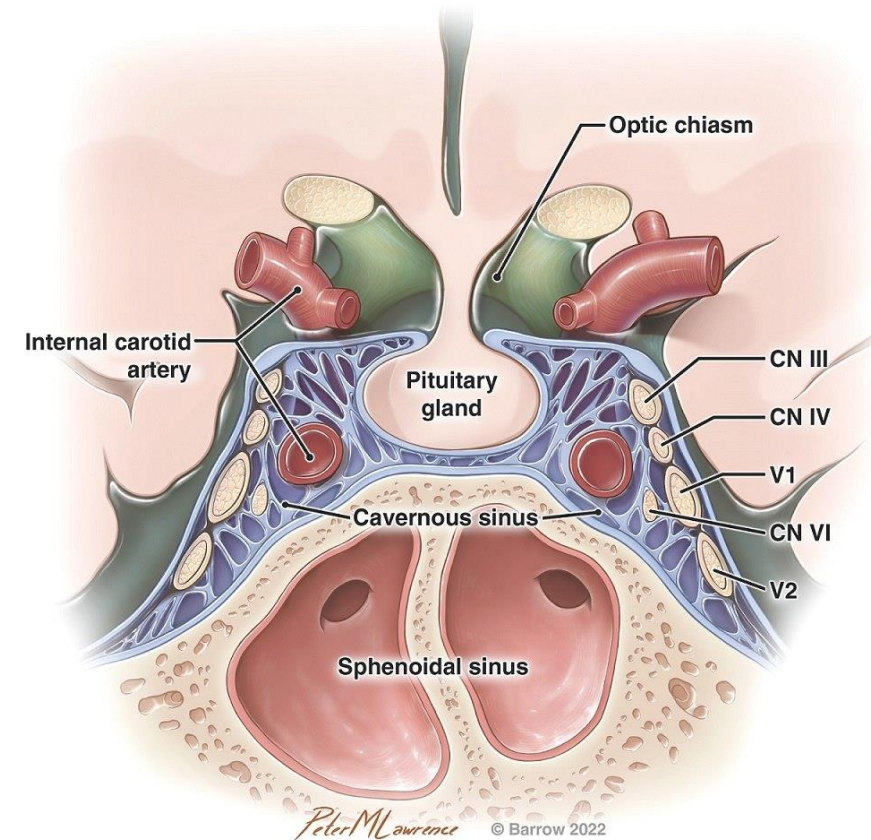


RELATIONS

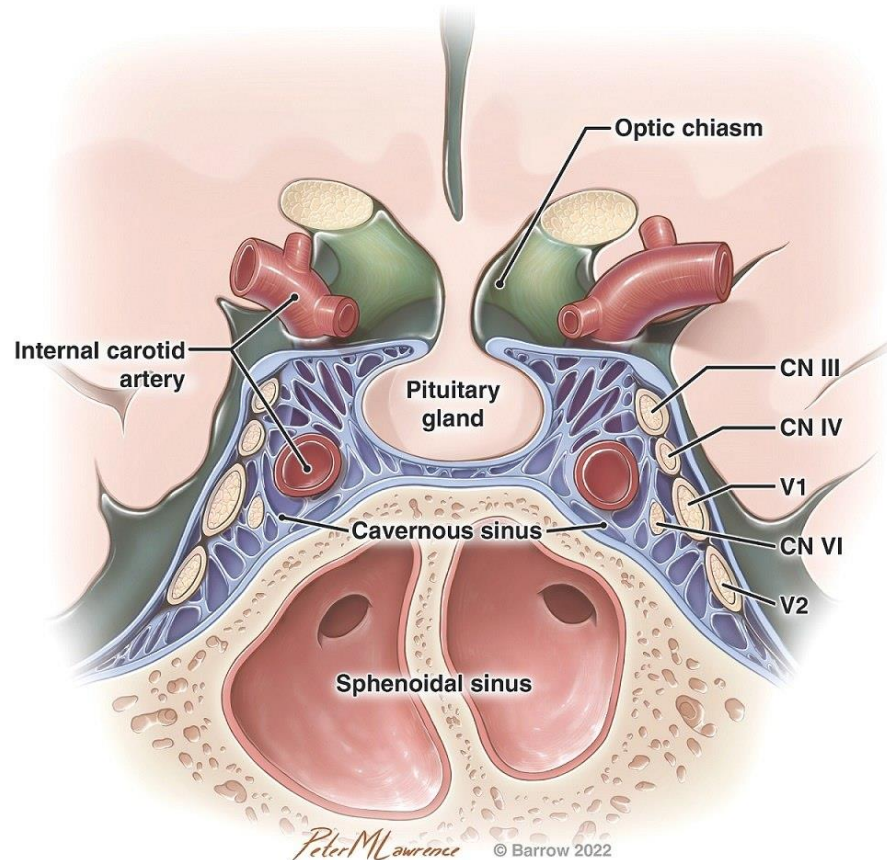
- The superior surface of the gland is covered by a reflection of the dura mater – the diaphragma sellae. This membrane has a central opening which allows passage of the infundibulum.

The gland has several key anatomical relations:

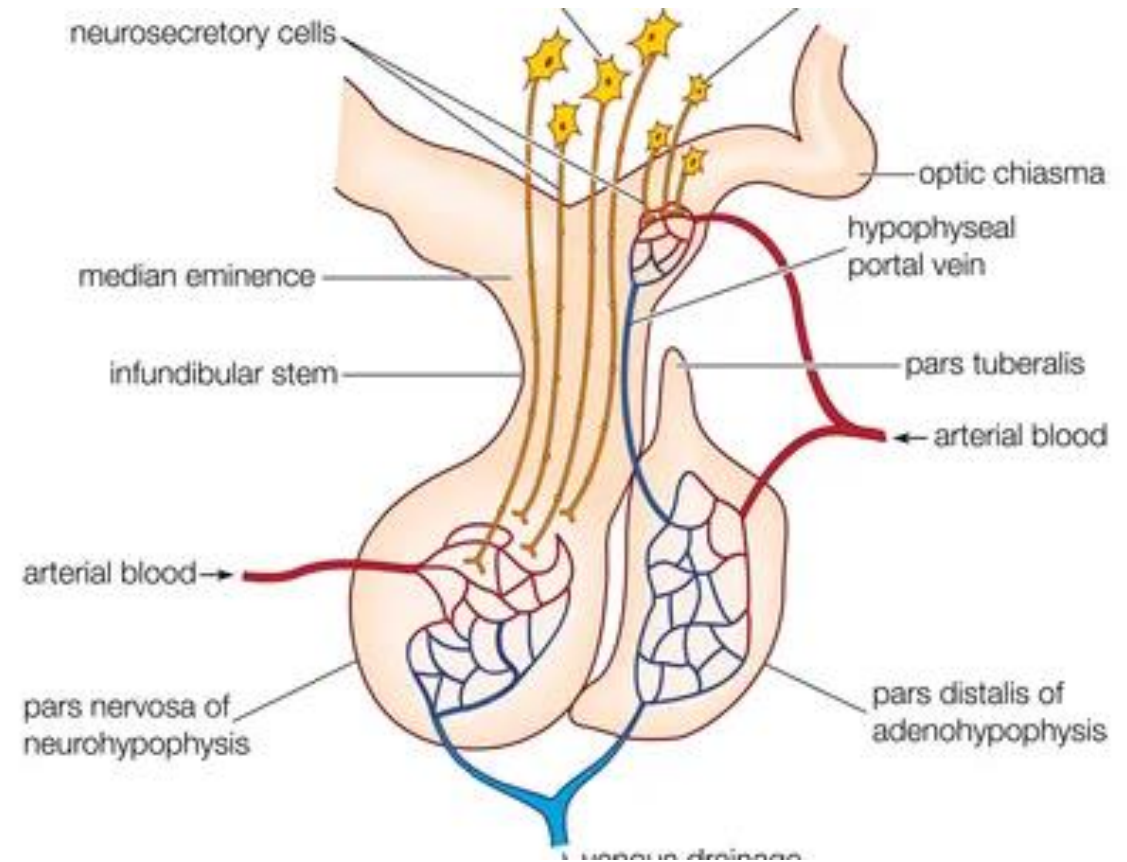
- Anteriorly – sphenoid sinus (the pituitary gland is accessed surgically via the sphenoid sinus, known as a trans-sphenoidal approach).
- Posteriorly – posterior intercavernous sinus, dorsum sellae (posterior wall of the sella turcica), basilar artery and the pons.
- Superiorly – diaphragma sellae (fold of dura mater that covers the pituitary gland), optic chiasm.
- Inferiorly – sphenoid sinus
- Laterally – cavernous sinus.



PITUITARY GLAND



<https://www.barrowneuro.org/resource/about-the-pituitary-gland/>



<https://www.britannica.com/science/pituitary-gland>



EMBRYOLOGY

➤ Anterior Lobe

- The anterior lobe (adenohypophysis) is derived from an outpouching of the roof of the pharynx, called **Rathke's pouch**.

➤ Posterior Lobe

- The posterior lobe (neurohypophysis) consists of nervous tissue. It arises from the embryonic **forebrain**, and is, in essence, an extension of the hypothalamus.



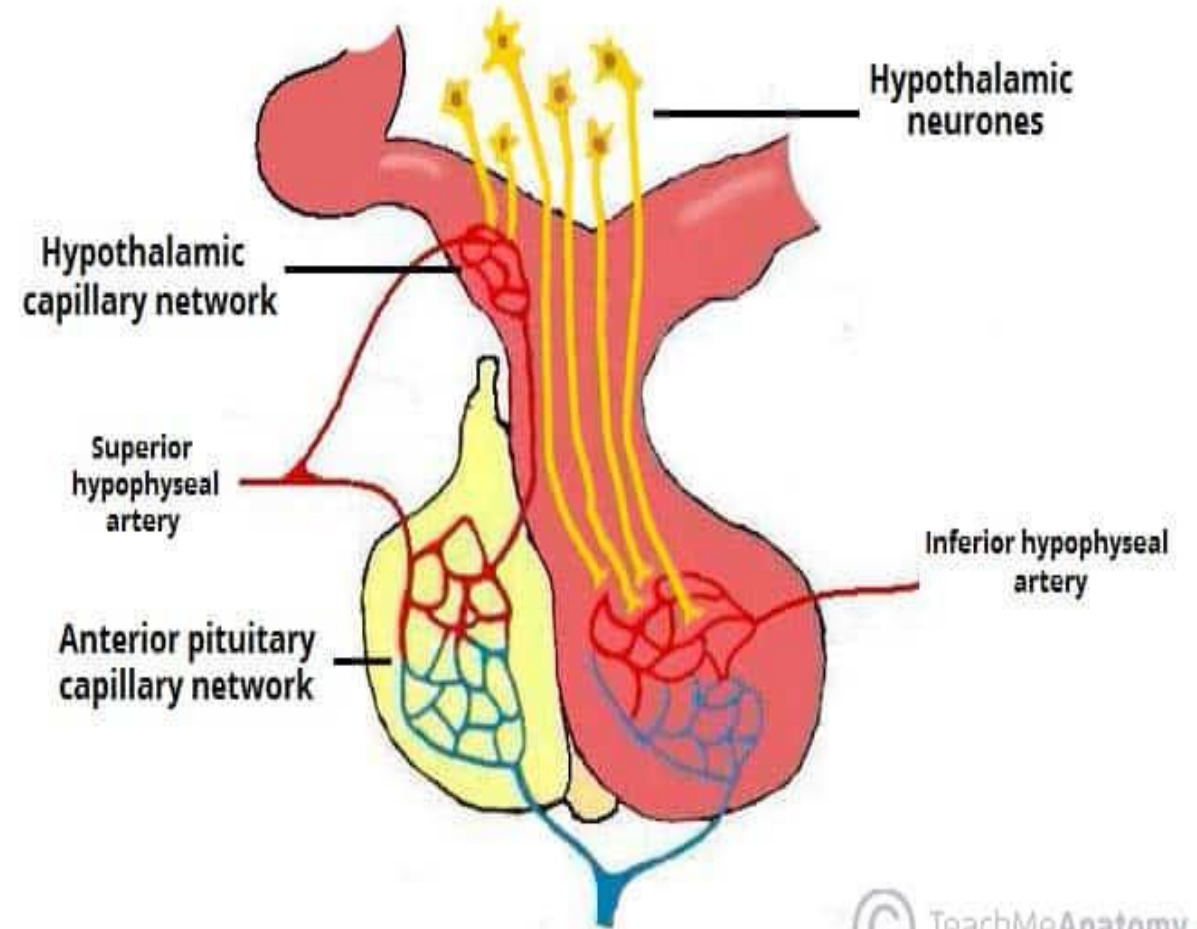
BLOOD SUPPLY

➤ Anterior Pituitary

- Superior hypophyseal artery (a branch of the internal carotid artery). Known as the **hypophyseal portal system**,

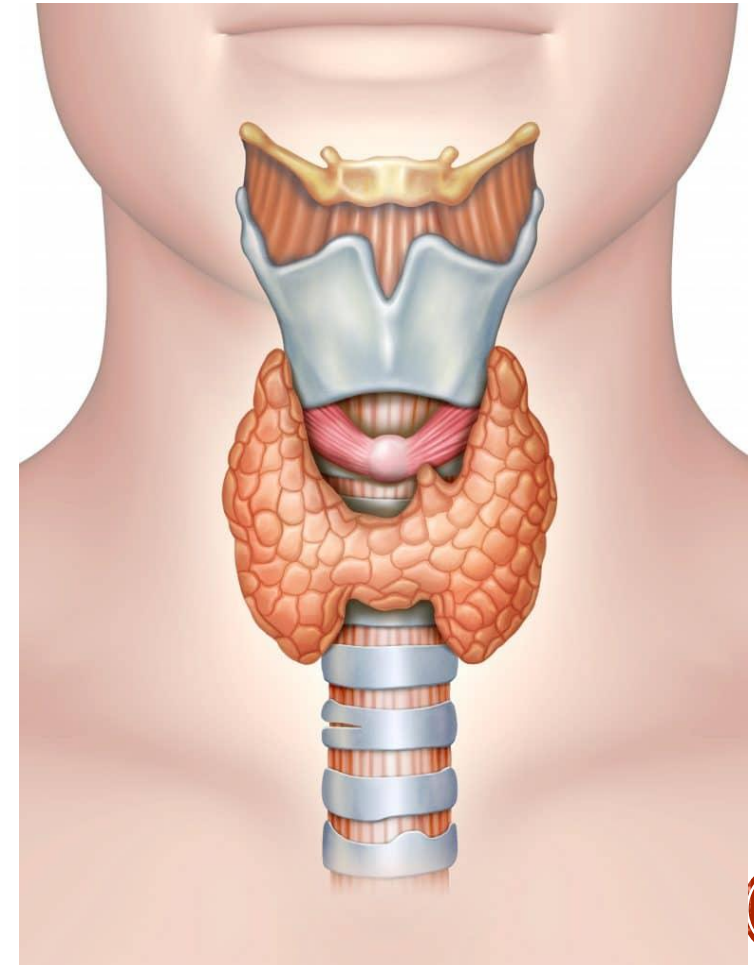
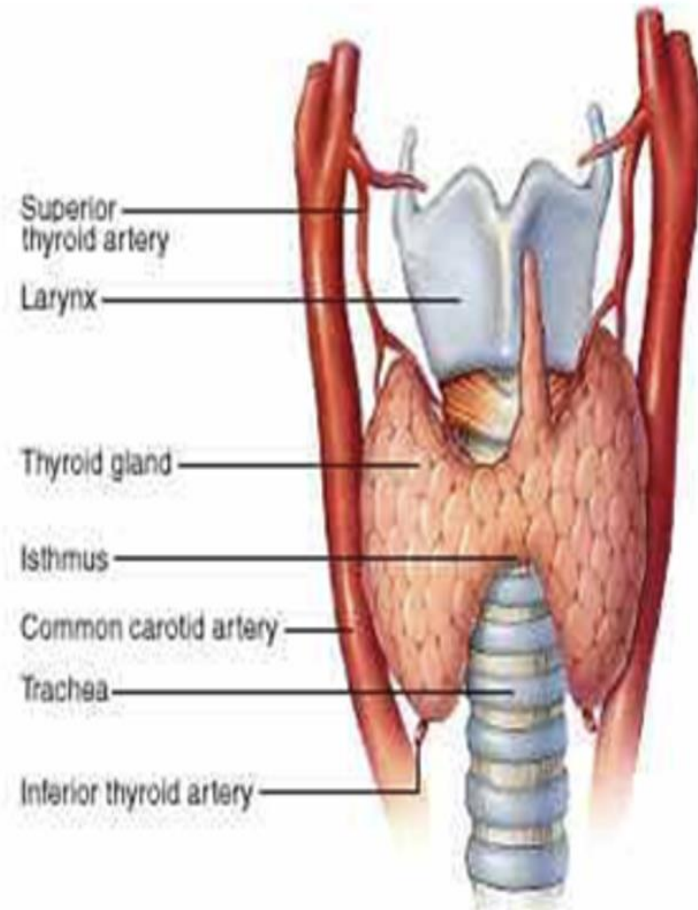
➤ Posterior Pituitary

- Superior hypophyseal artery, infundibular artery and inferior hypophyseal artery.



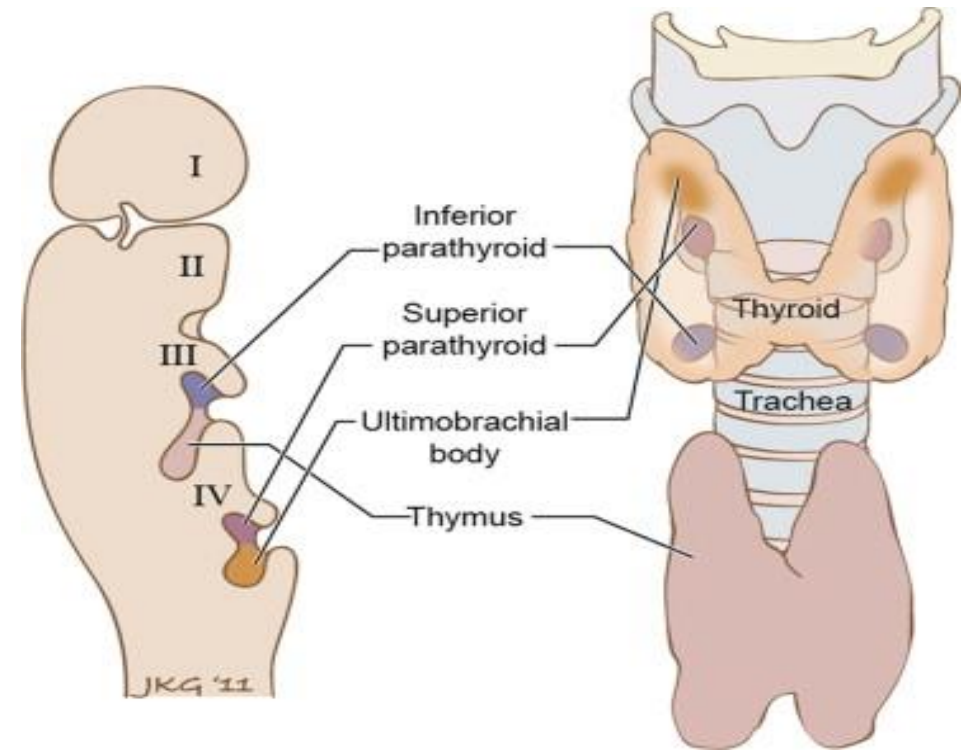
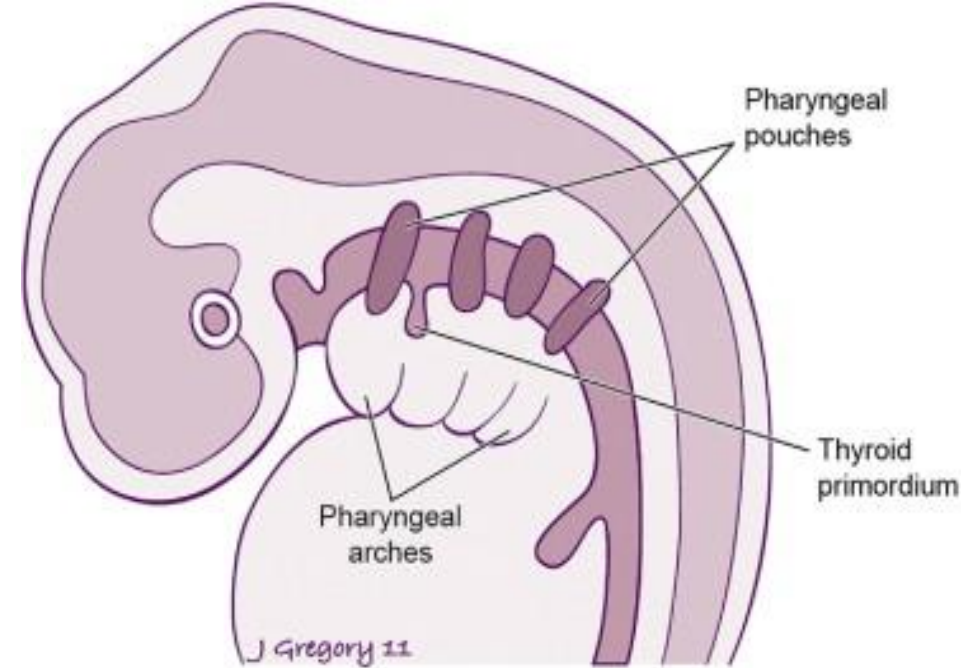
THYROID GLAND

- The largest endocrine gland in the body
- About 25 gm
- A butterfly shaped gland
- Formed by 2 lateral lobes connected by the isthmus

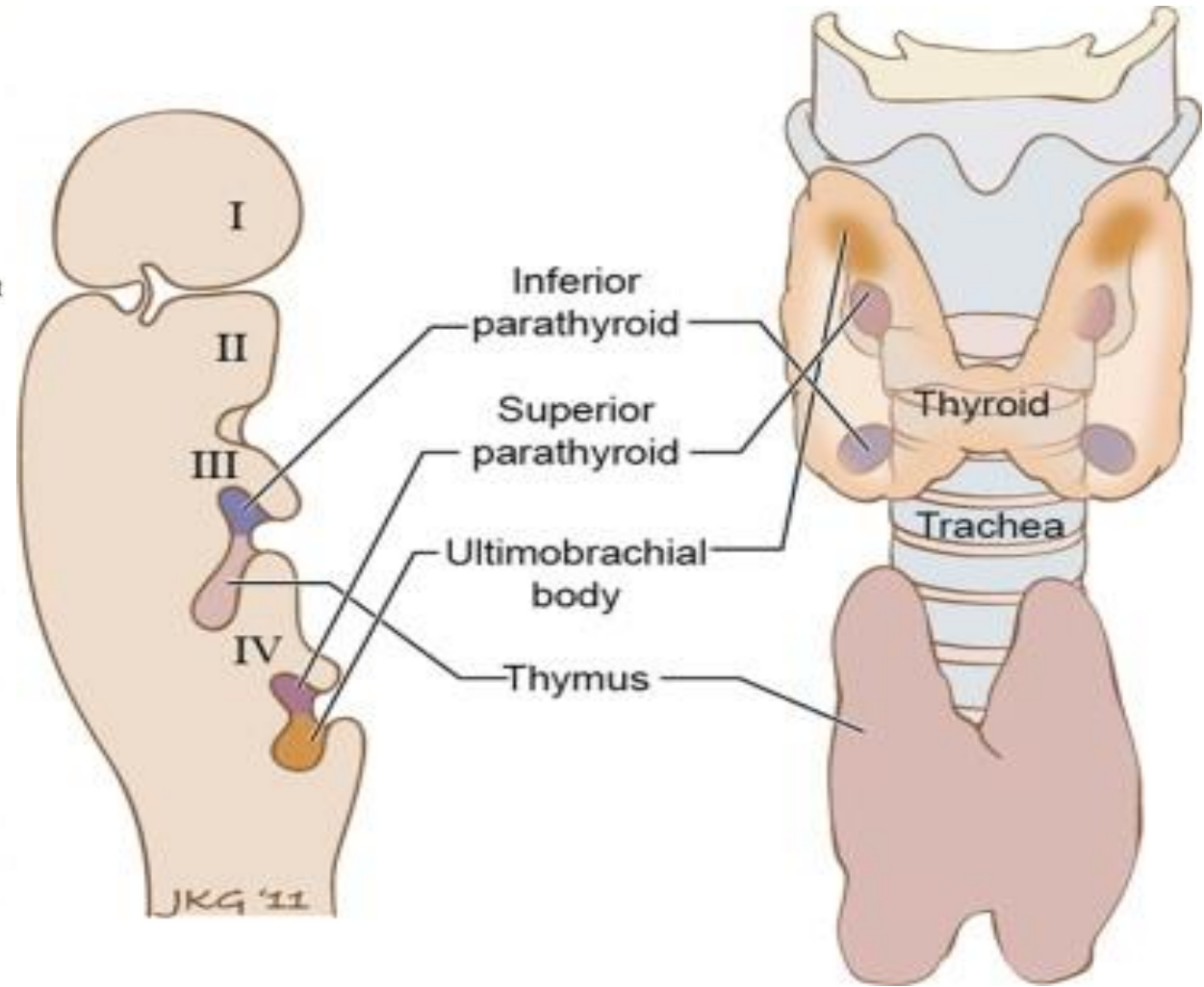
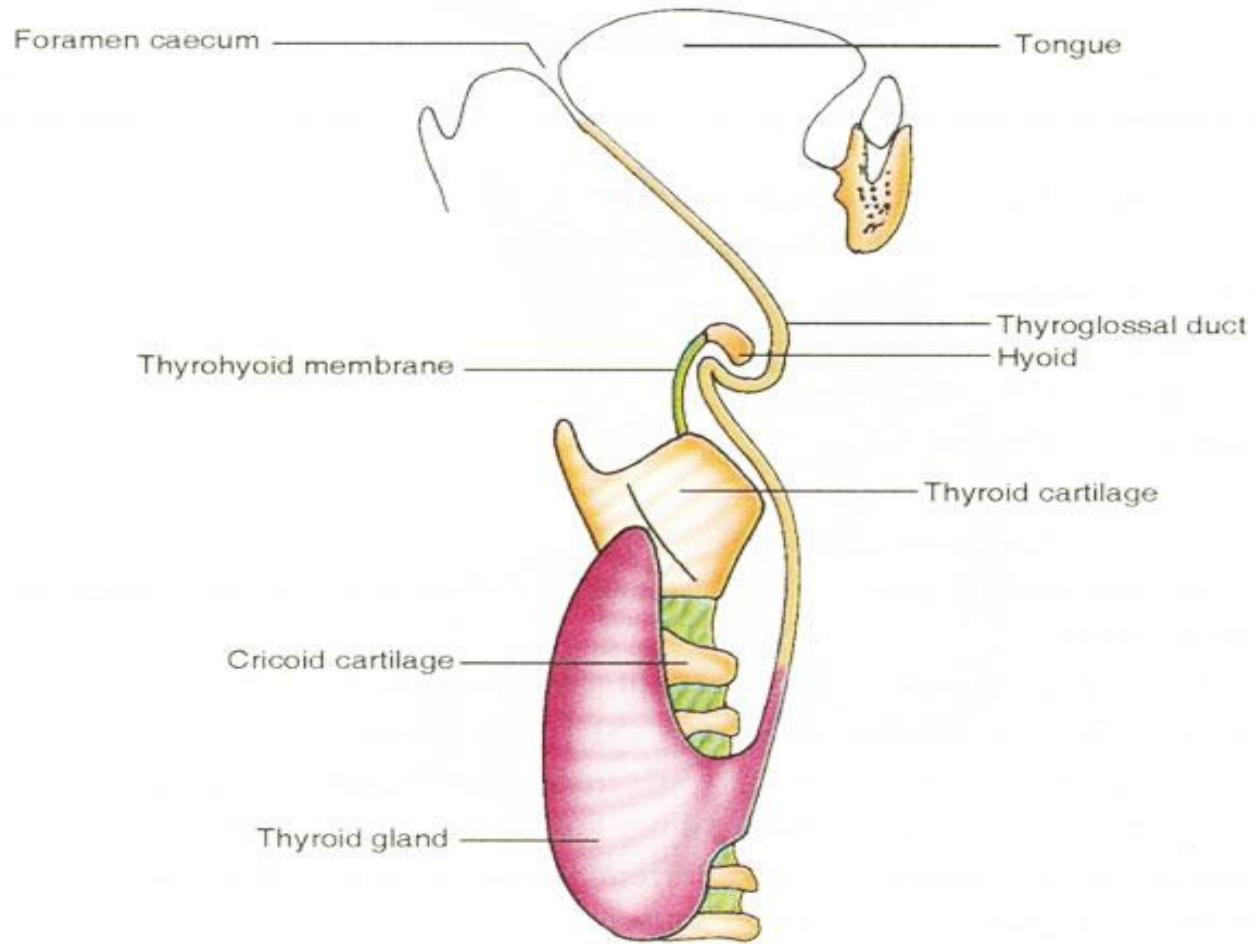


EMBRYOLOGY

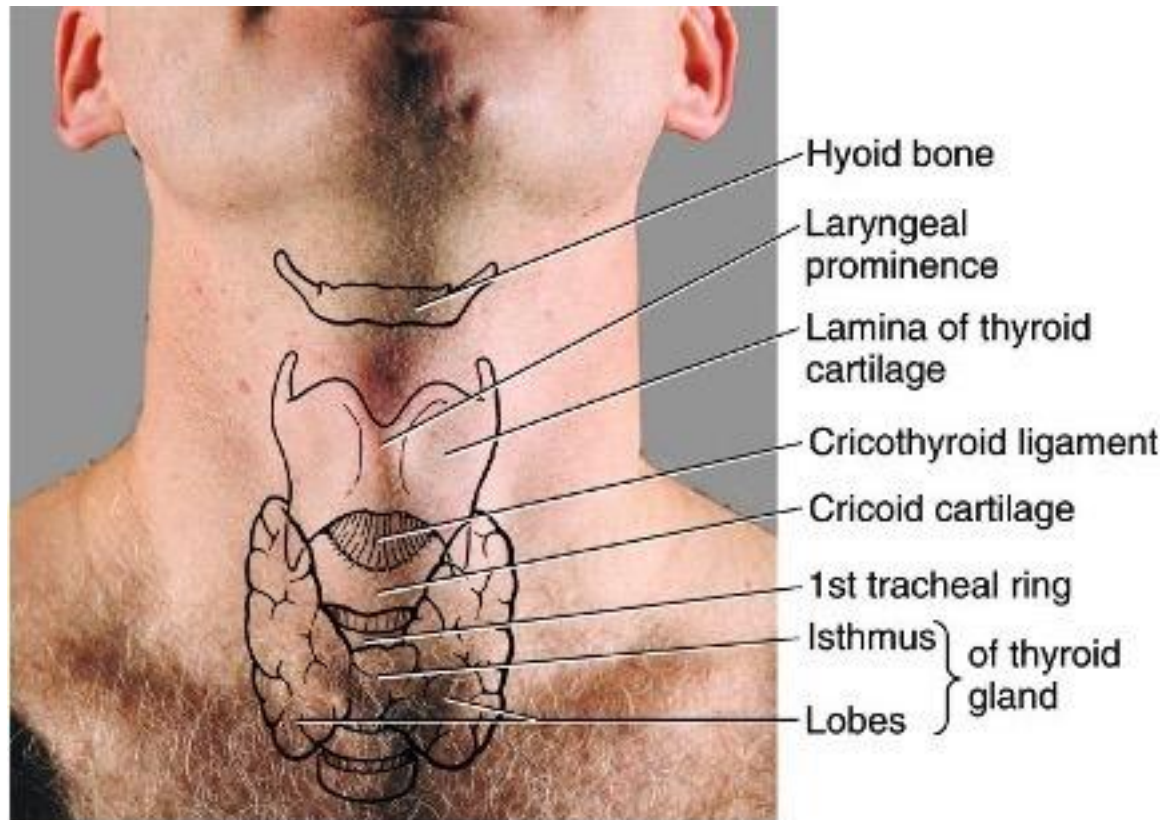
- It is developed from endodermal cells of floor of pharynx (area of developing tongue).
- It begins a median thyroid diverticulum at dorsum of tongue at foramen cecum between tuberculum impar and hypobranchial eminence.
- Elongation of thyroid diverticulum to form thyroglossal duct. It elongates downwards caudally and anteriorly in front of hyoid and thyroid cartilage where it ends by dividing into 2 parts.
- Ultimobranchial body gives parafollicular cells to thyroid gland.



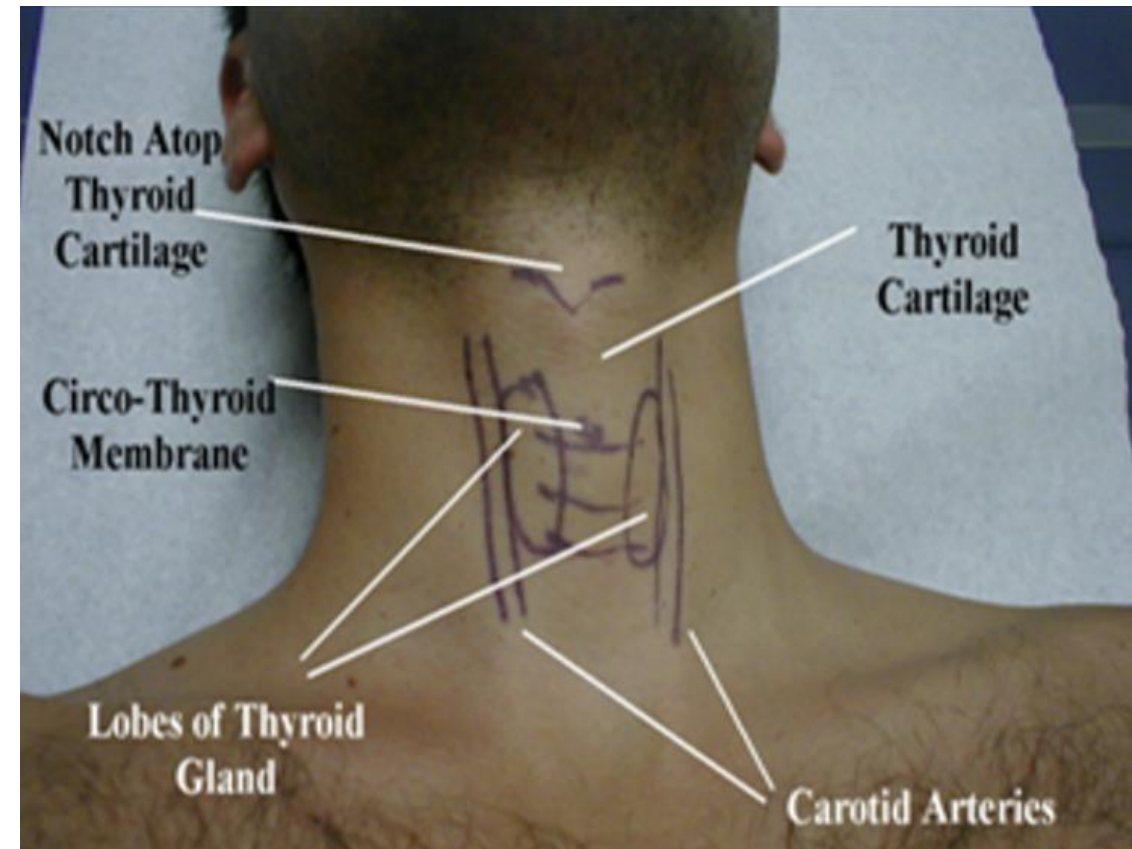
EMBRYOLOGY



SURFACE ANATOMY



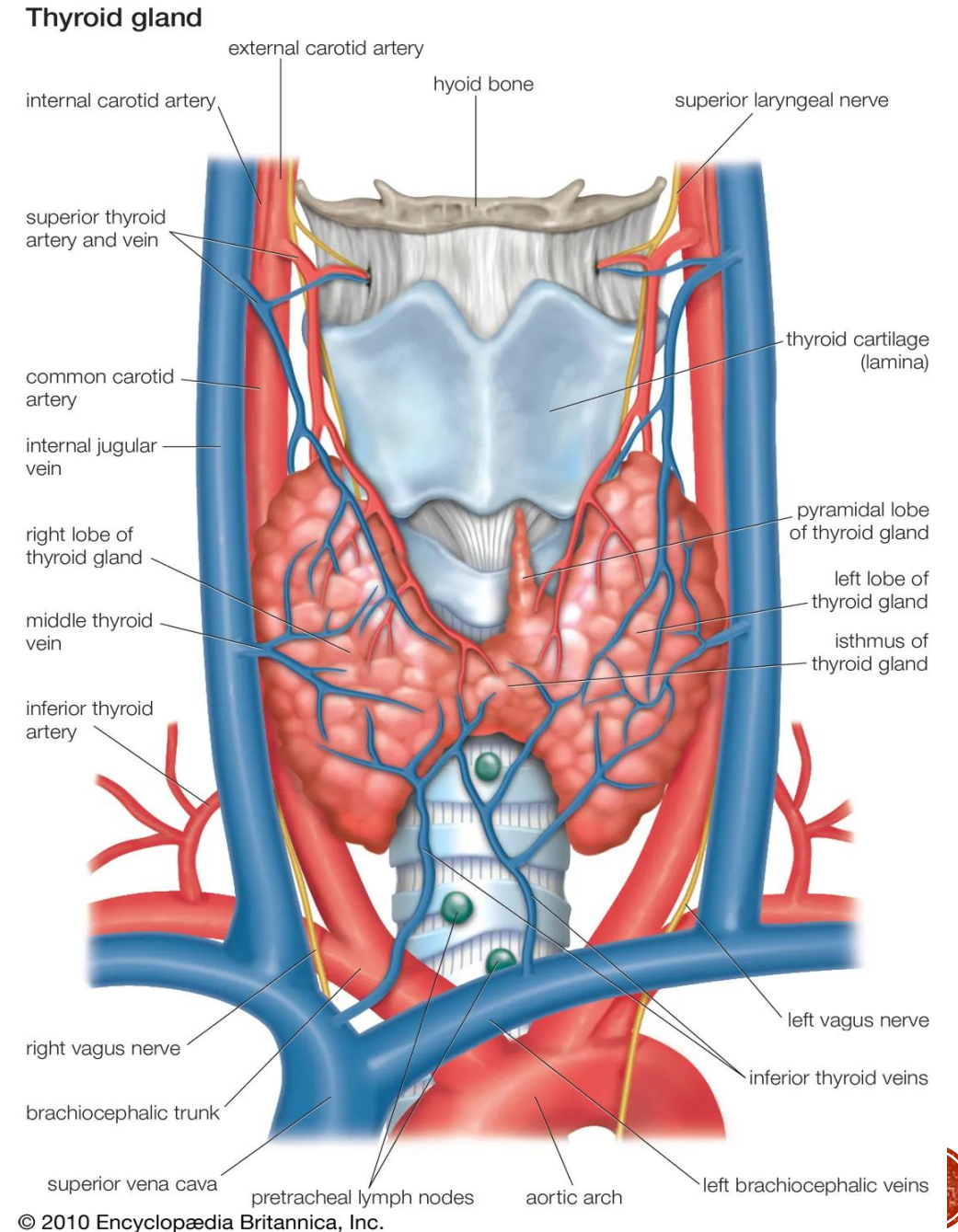
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POSITION

➤ Position:

- It lies on front & sides of the lower part of neck.
- The apex of each lobe rests on the thyroid cartilage, reaching its oblique line.
- The base of each lobe reaches the level of 5th or 6th tracheal ring.
- The isthmus crosses the trachea opposite the 2nd, 3rd & 4th tracheal rings



STRUCTURE

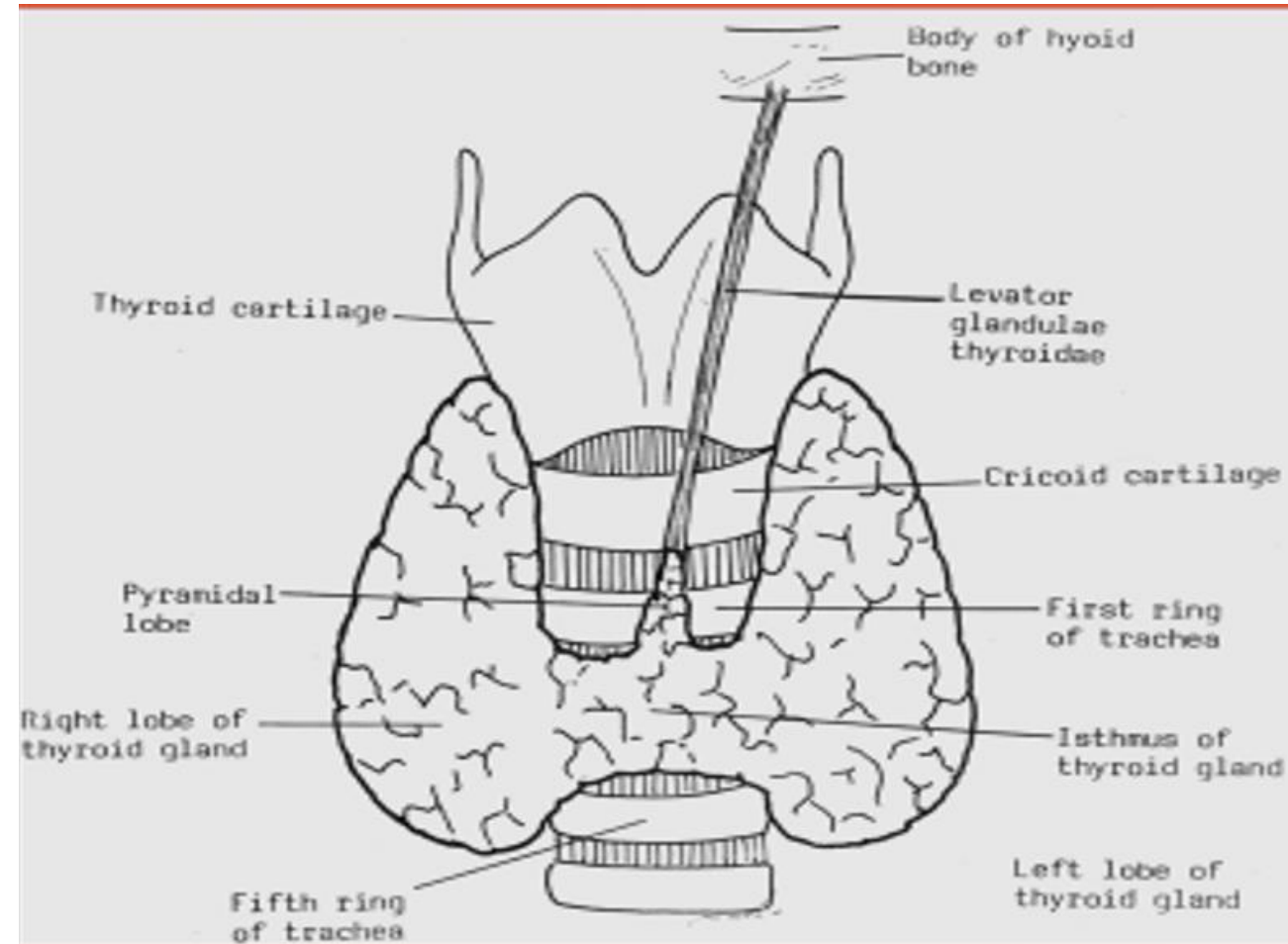
➤ Each lobe is pear-shaped, which has

❑ Apex

❑ Base

❑ 3 surfaces:

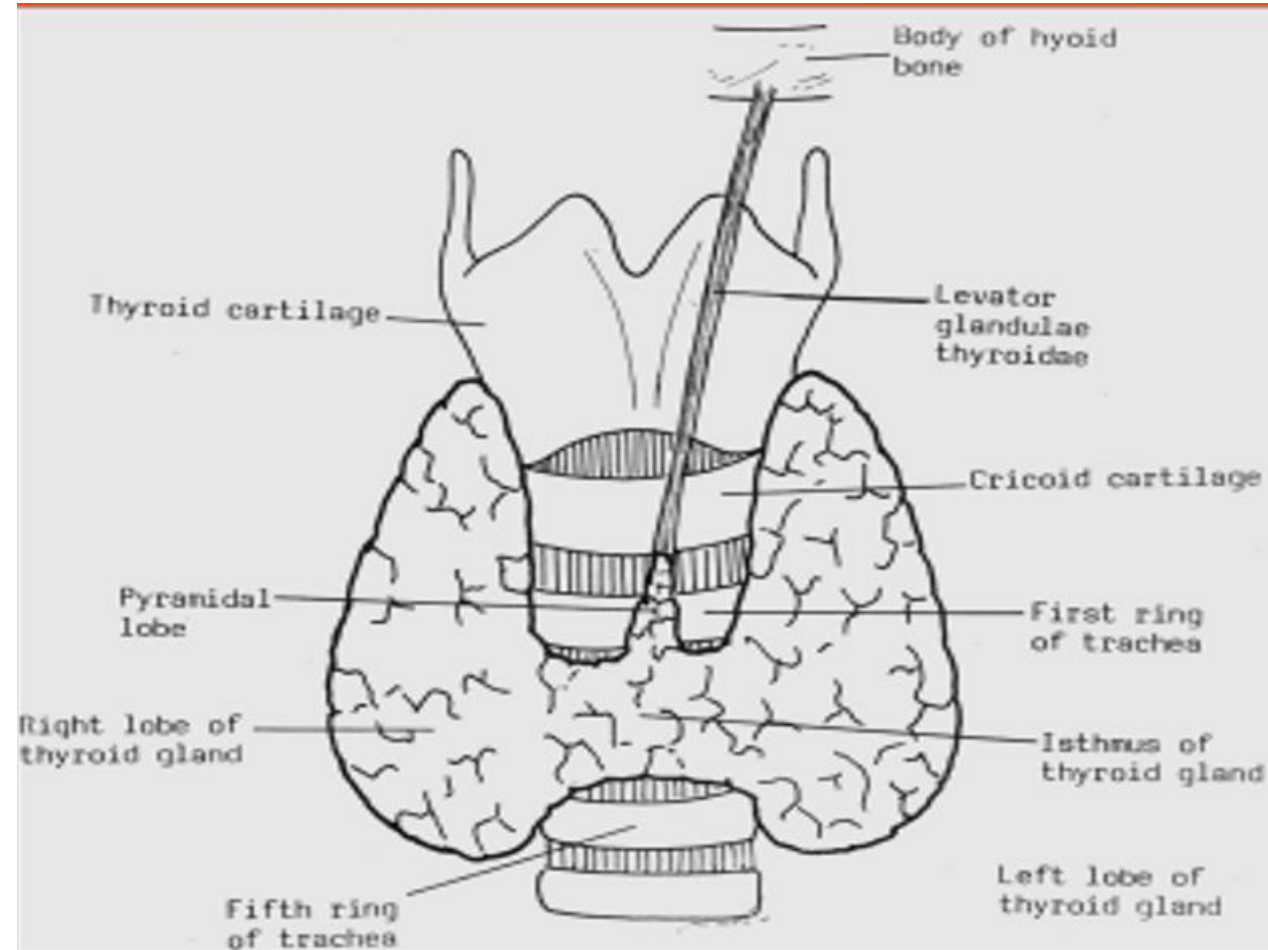
- . Medial surface
- Anterolateral surface
- Posterior surface



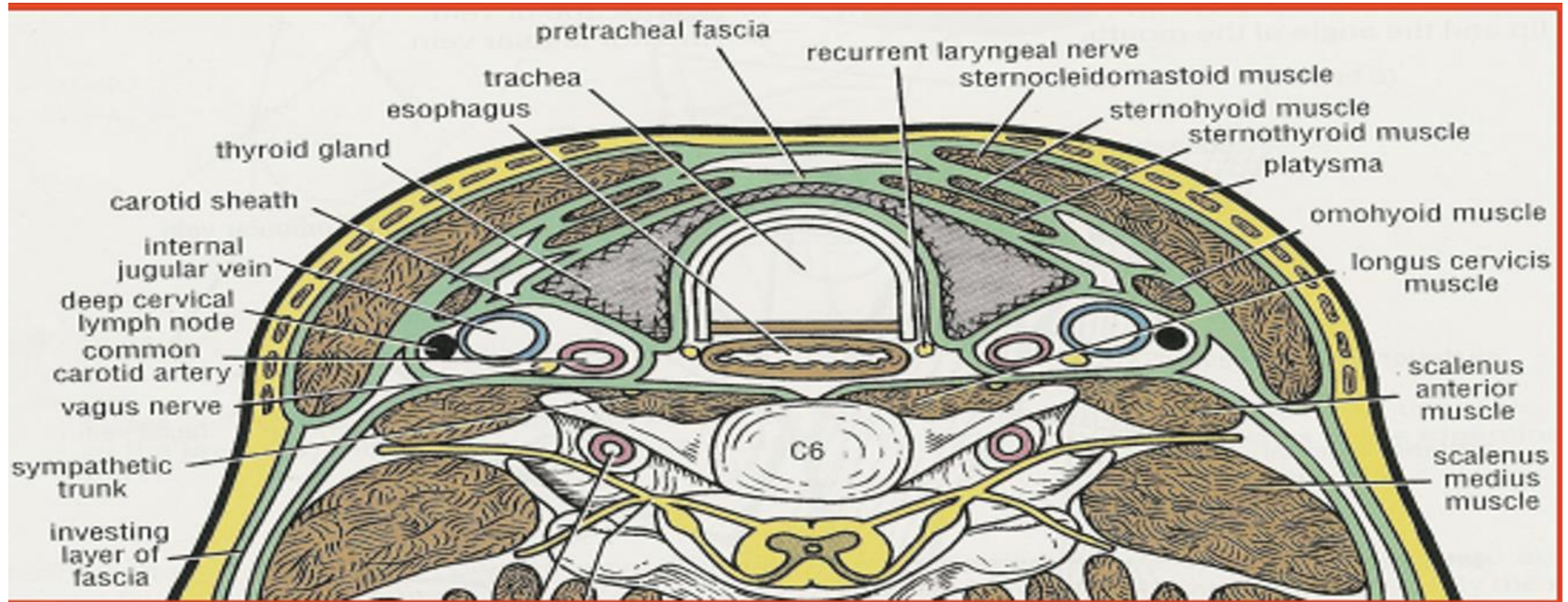
STRUCTURE

N.B.

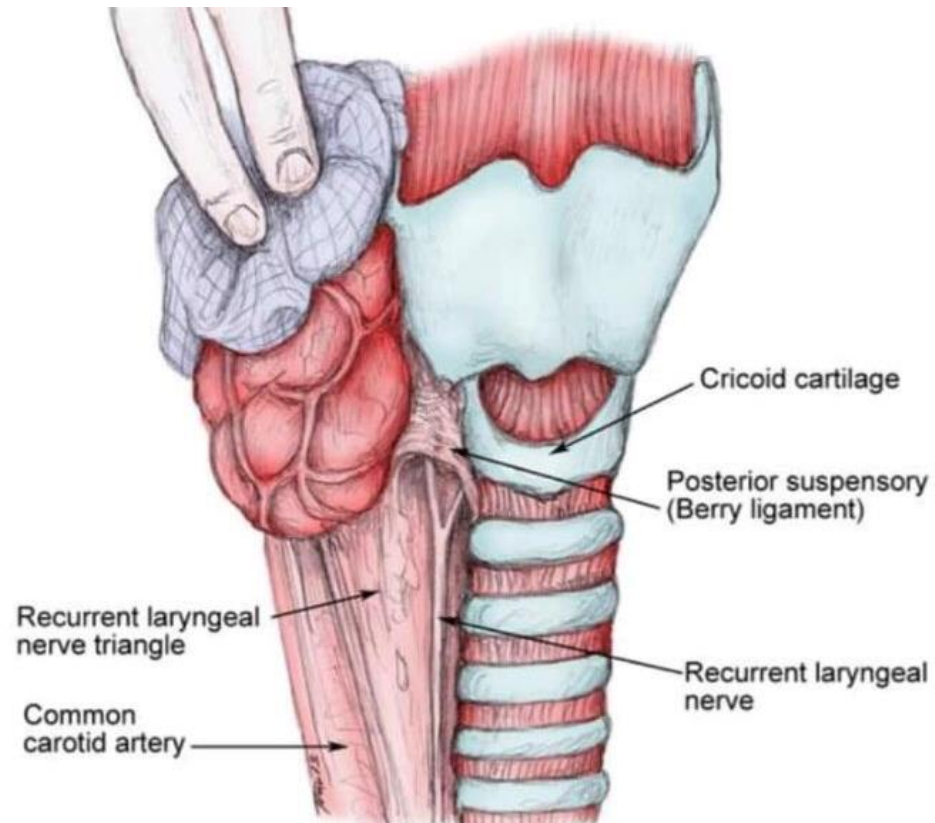
- A narrow median isthmus connecting the 2 lateral lobes.
- A small "pyramidal lobe" may project upwards from the upper border of the isthmus and may be connected to the hyoid bone by a fibromuscular band called "**levator glandulae thyroideae**" (remnant of Thyroglossal duct in the embryo).



- **Capsule:** the gland has 2 capsules.
 - **True fibrous capsule:** enclosing the gland
 - **False facial capsule:** derived from the pretracheal fascia.
- The big vessels of the gland run between the 2 capsules.



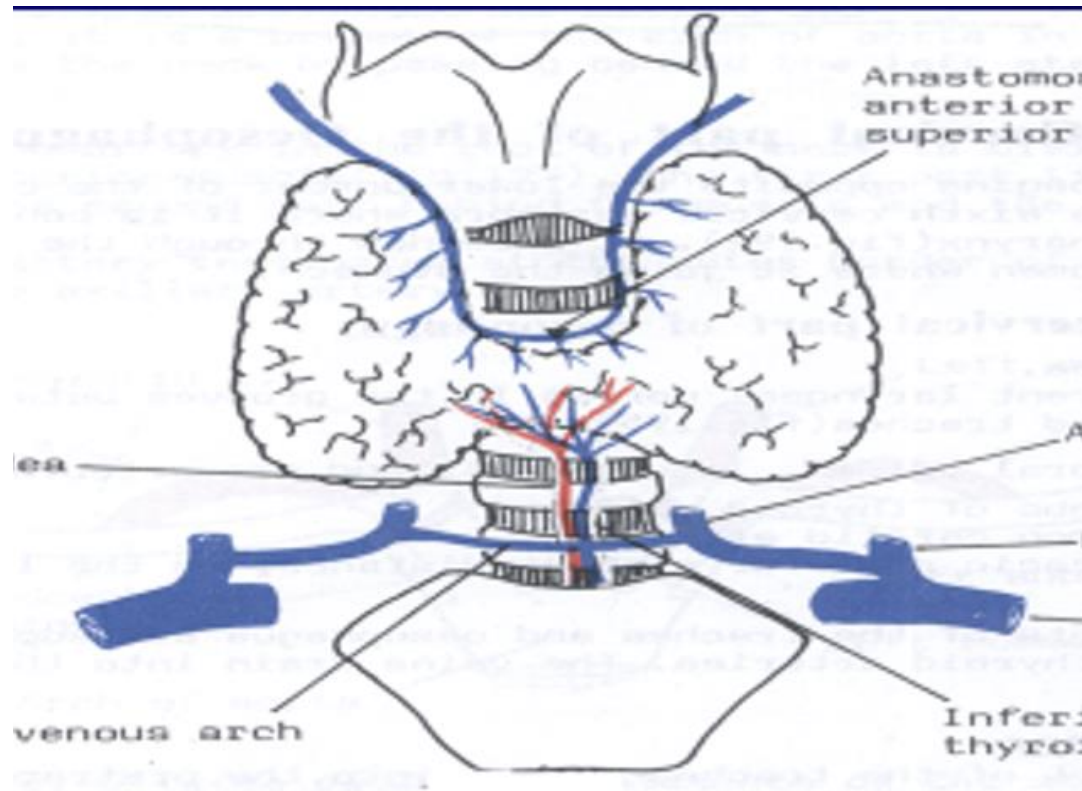
MOVEMENT WITH THE TONGUE PROTRUSION



- The attachment of the fascial capsule to larynx causes the movement of the gland up and down during the deglutition.



RELATIONS OF THE THYROID GLAND

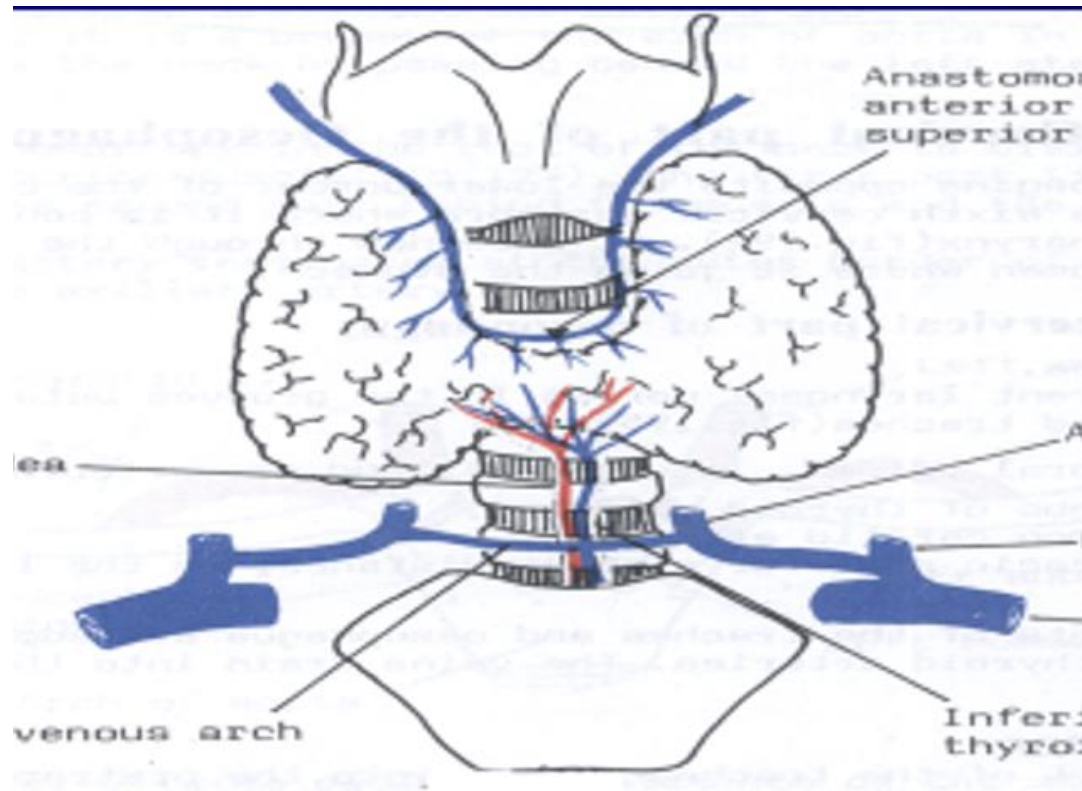


Its upper border:

- Is related to anastomotic branch between the 2 superior thyroid arteries.
- The pyramidal lobe may project upwards from it.



RELATIONS OF THE THYROID GLAND



Its lower border:

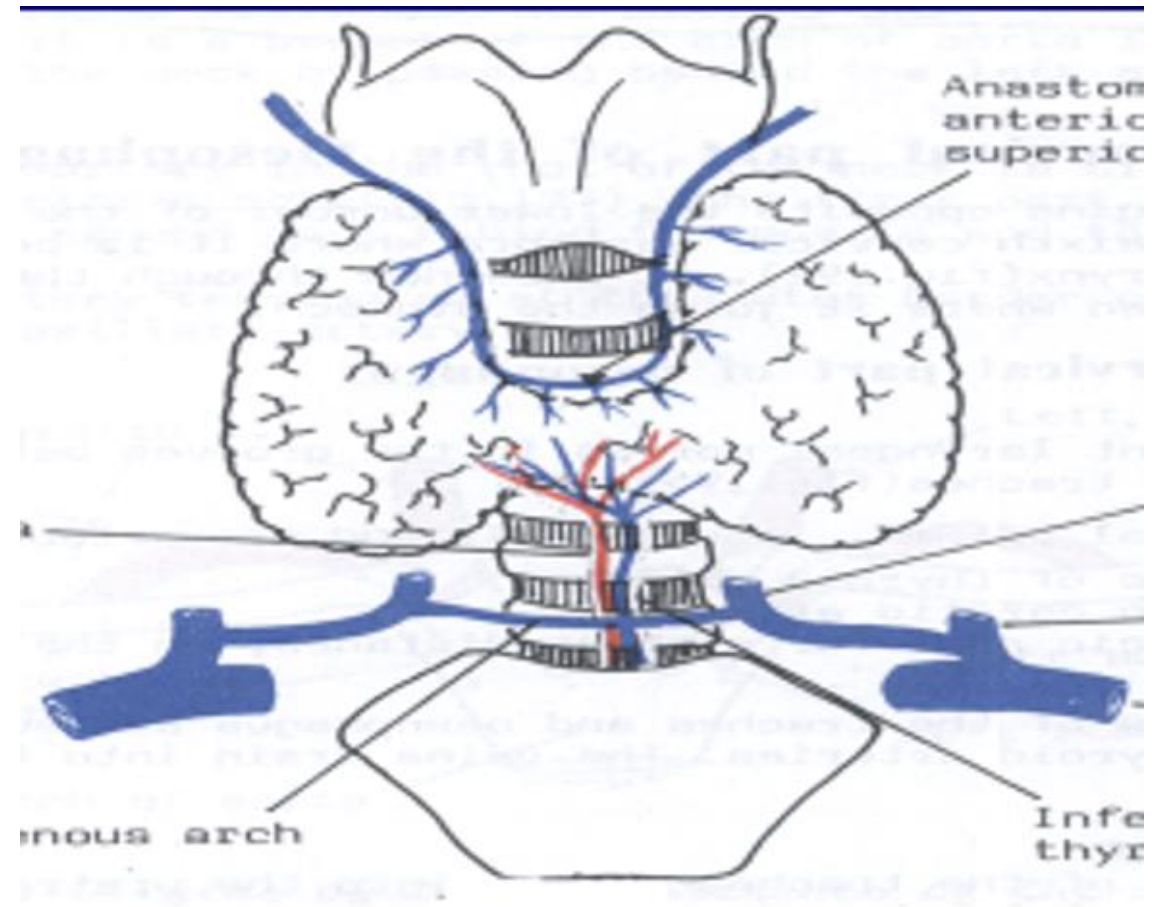
- Is related to the inferior thyroid veins, which emerge from the isthmus and the lower parts of both lobes.
- The thyroidea ima artery



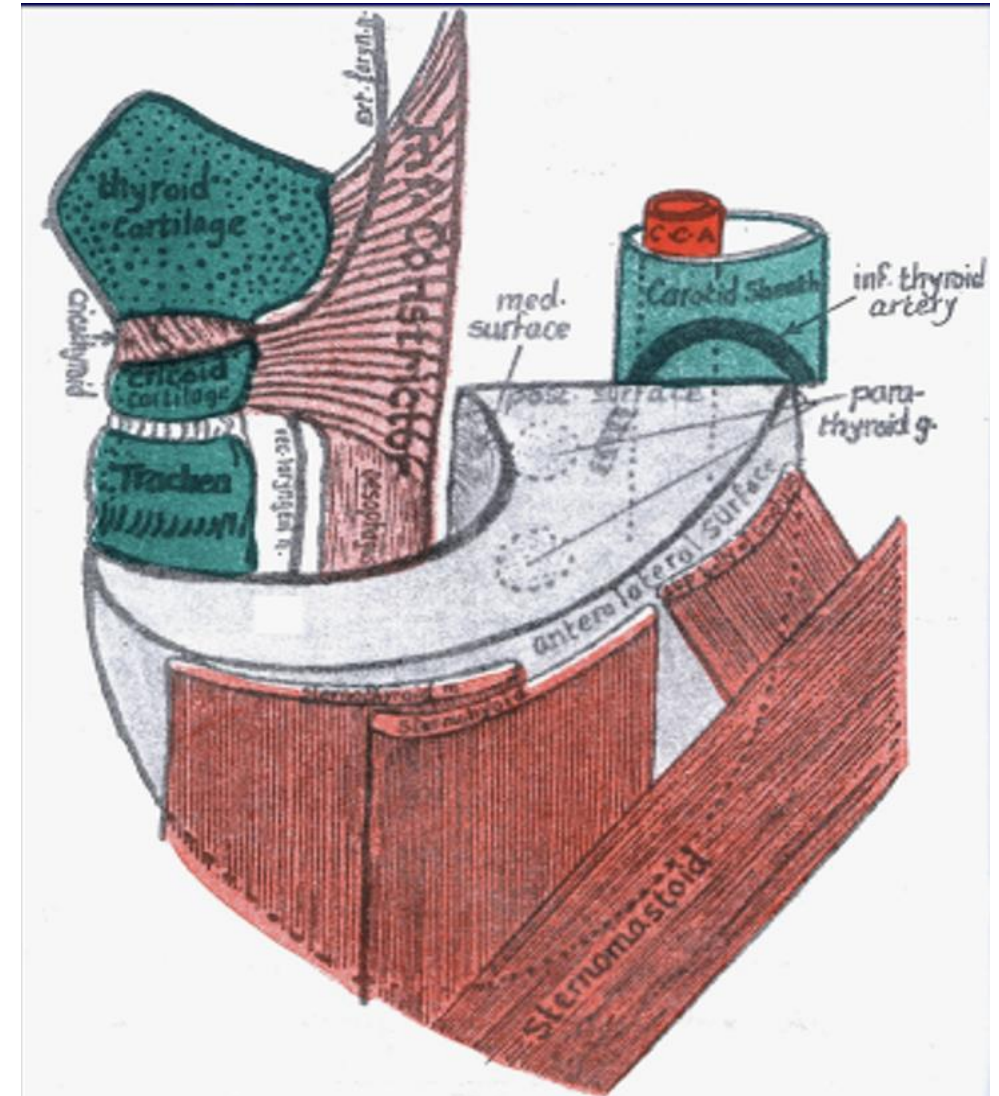
RELATIONS OF THE THYROID GLAND

Isthmus:

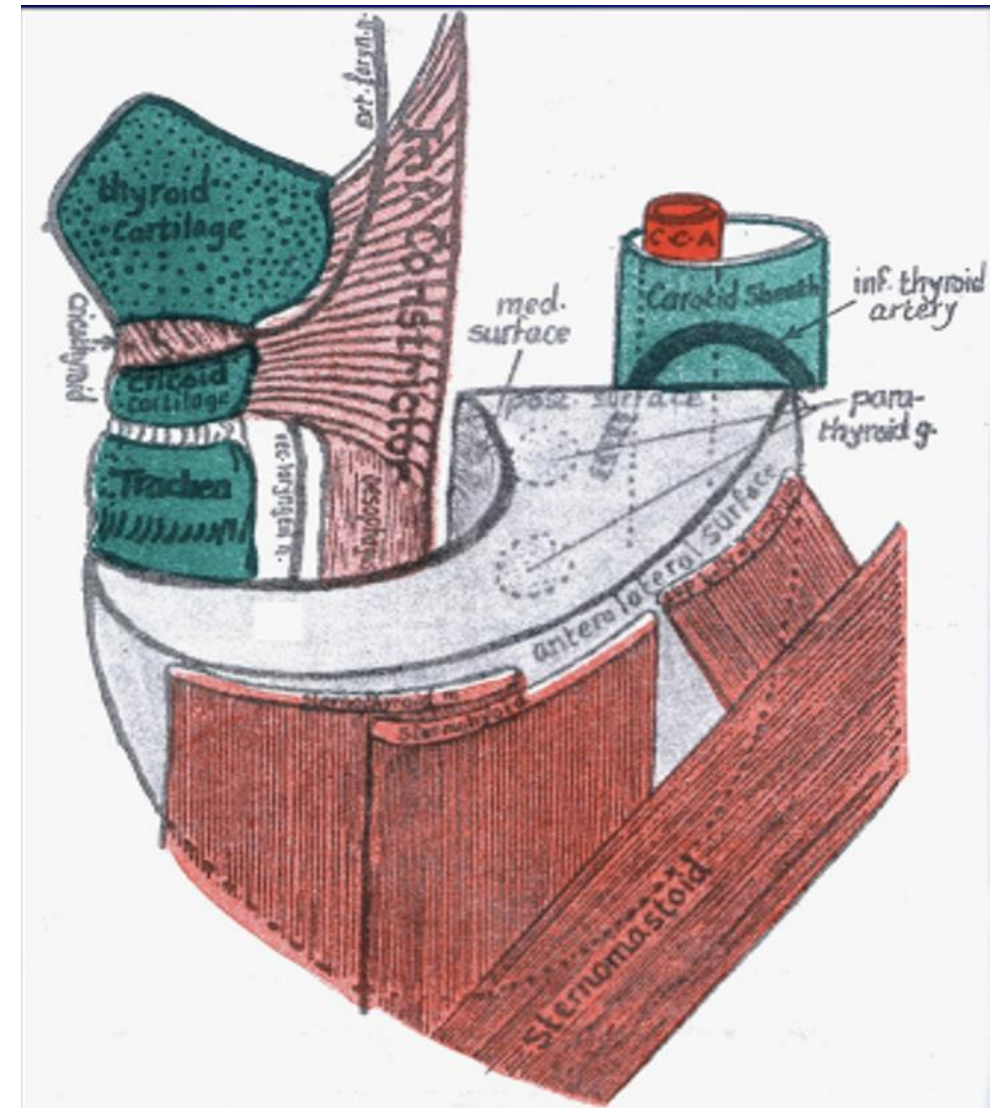
- It is nearer to the bases than the apices of the 2 lobes of the gland.
- It has
 - ✓ 2 surfaces: anterior & posterior
 - ✓ 2 borders: upper & lower
- Anteriorly: it is covered by the
 - Skin & S. fascia.
 - Anterior jugular veins.
 - Deep fascia.
 - Sternohyoid & Sternothyroid muscles.
- Posteriorly: it is related to 2nd, 3rd & 4th tracheal rings



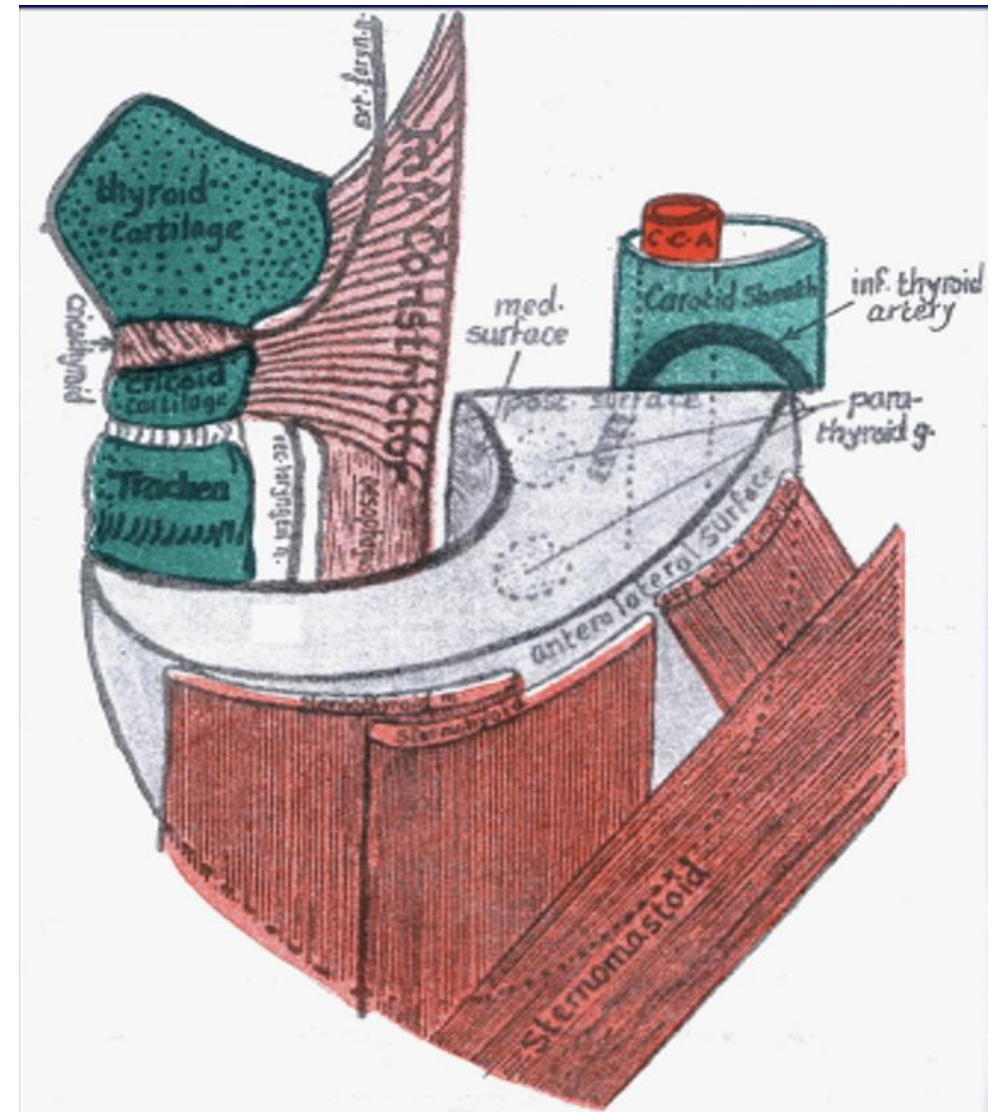
- Medial surface:
 - Above -----> is related to:
 - Larynx (thyroid and cricoid cartilages & cricothyroid muscle).
 - Pharynx (inferior constrictor muscle).
 - External laryngeal nerve.
 - Below -----> is related to:
 - Upper 6 rings of
 - Trachea.
 - Esophagus.
 - Recurrent laryngeal nerve in groove between them.



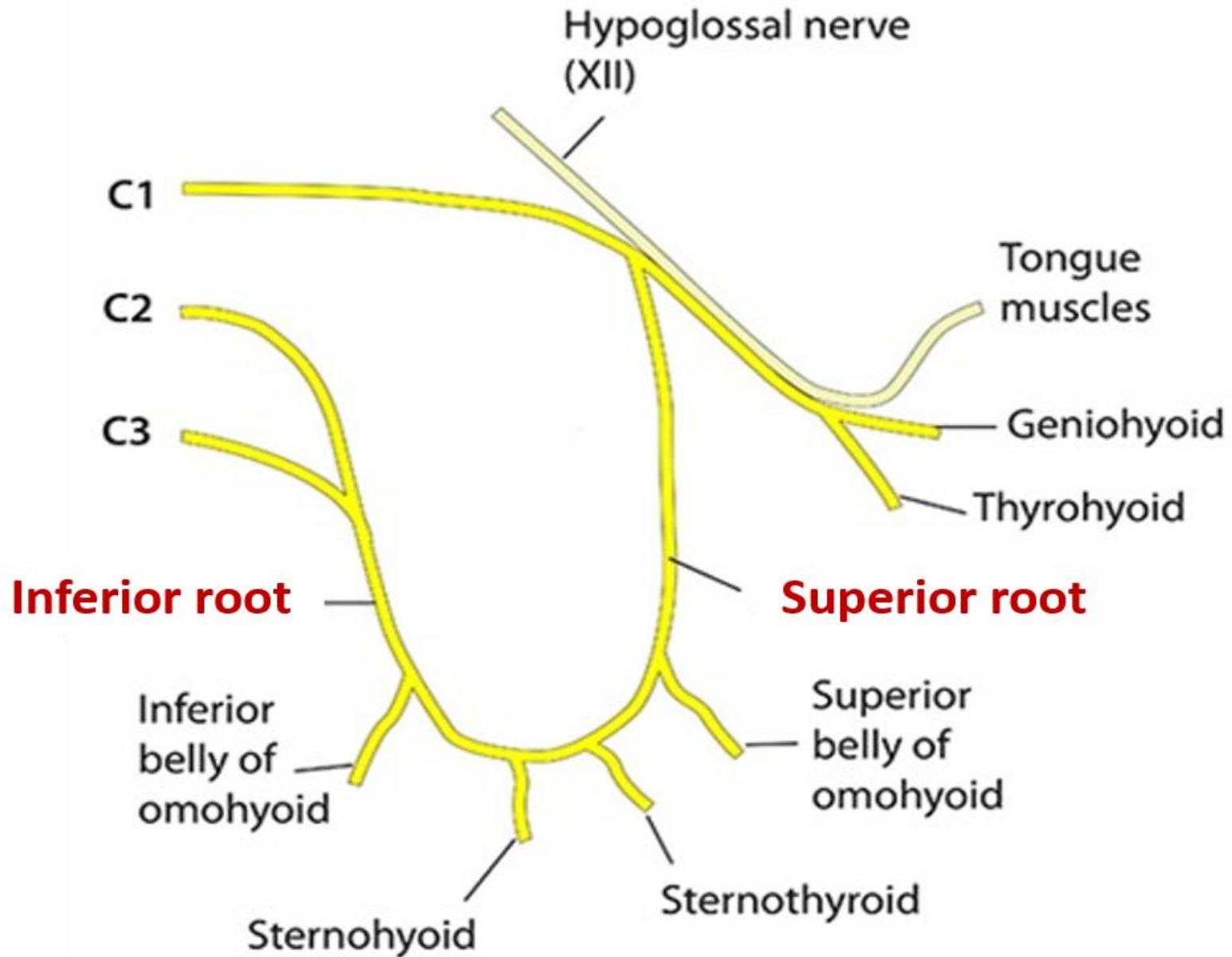
- Antrolateral (superficial) surface:
- Is covered by skin, superficial and deep fasciae Platysma m.
- It is overlapped by the sternothyroid, sternohyoid, superior belly of omohyoid and anterior border of sternocleidomastoid

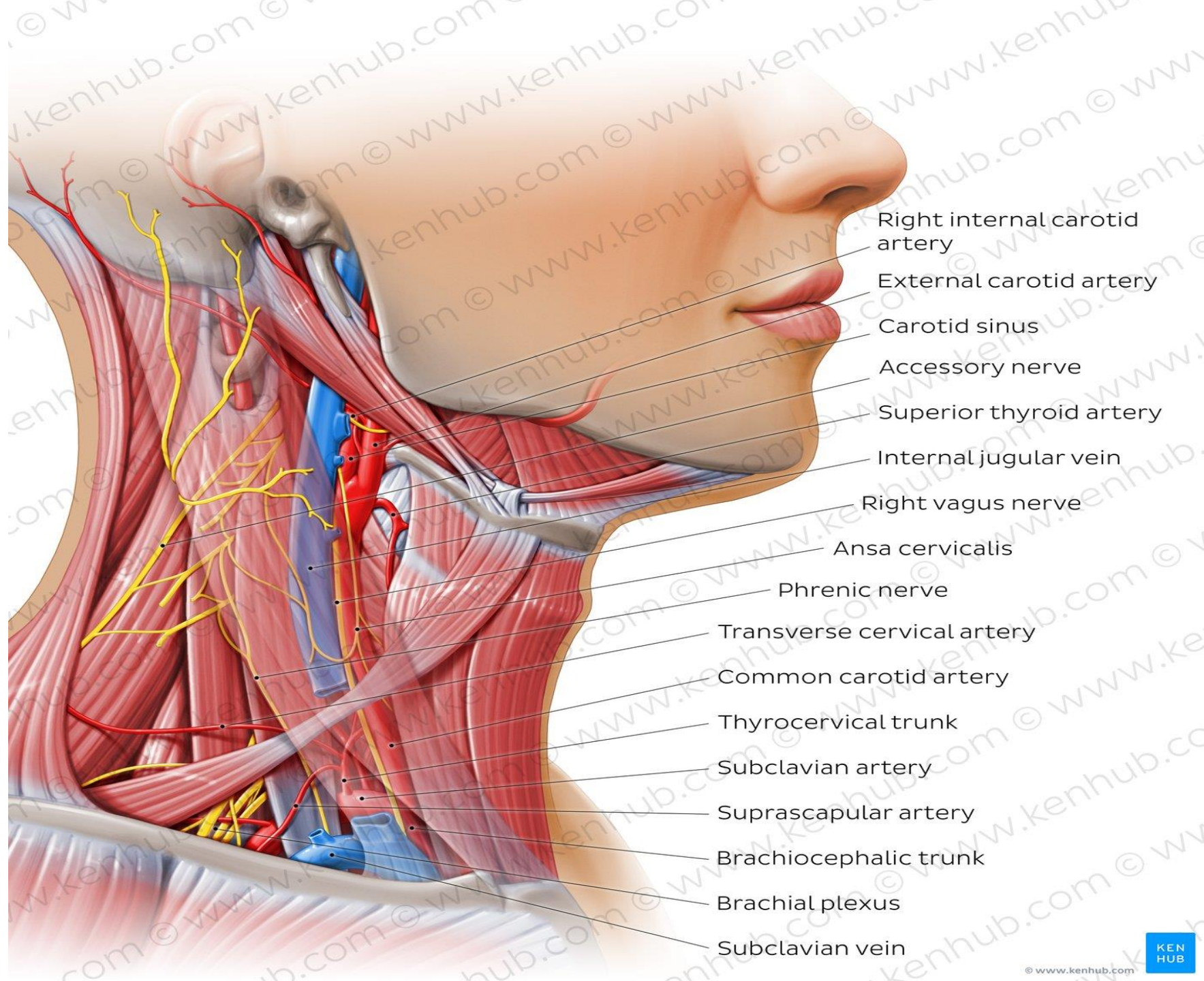


- **Posterior surface:**
- Is related to the carotid sheath where it overlaps the common carotid artery.
- 2 parathyroid glands
- ITA



Ansa Cervicalis and Muscles Supplied





Antero-lateral view of the left side of the neck. This is the same cadaver studied in previous images but at a more superficial stage of dissection. The sternocleidomastoid muscle was partially cut and reflected laterally. Note:

1) Identify the sternohyoid, omohyoid, and sternothyroid muscles; the thyrohyoid muscle is covered with a thin layer of cervical fascia.

2) The ansa cervicalis overlying the internal jugular vein.

Hyoid Bone

Cervical fascia overlying the thyrohyoid muscle

Omohyoid M.

Sternothyroid M.

Sternohyoid M.

Description 3

Description 2

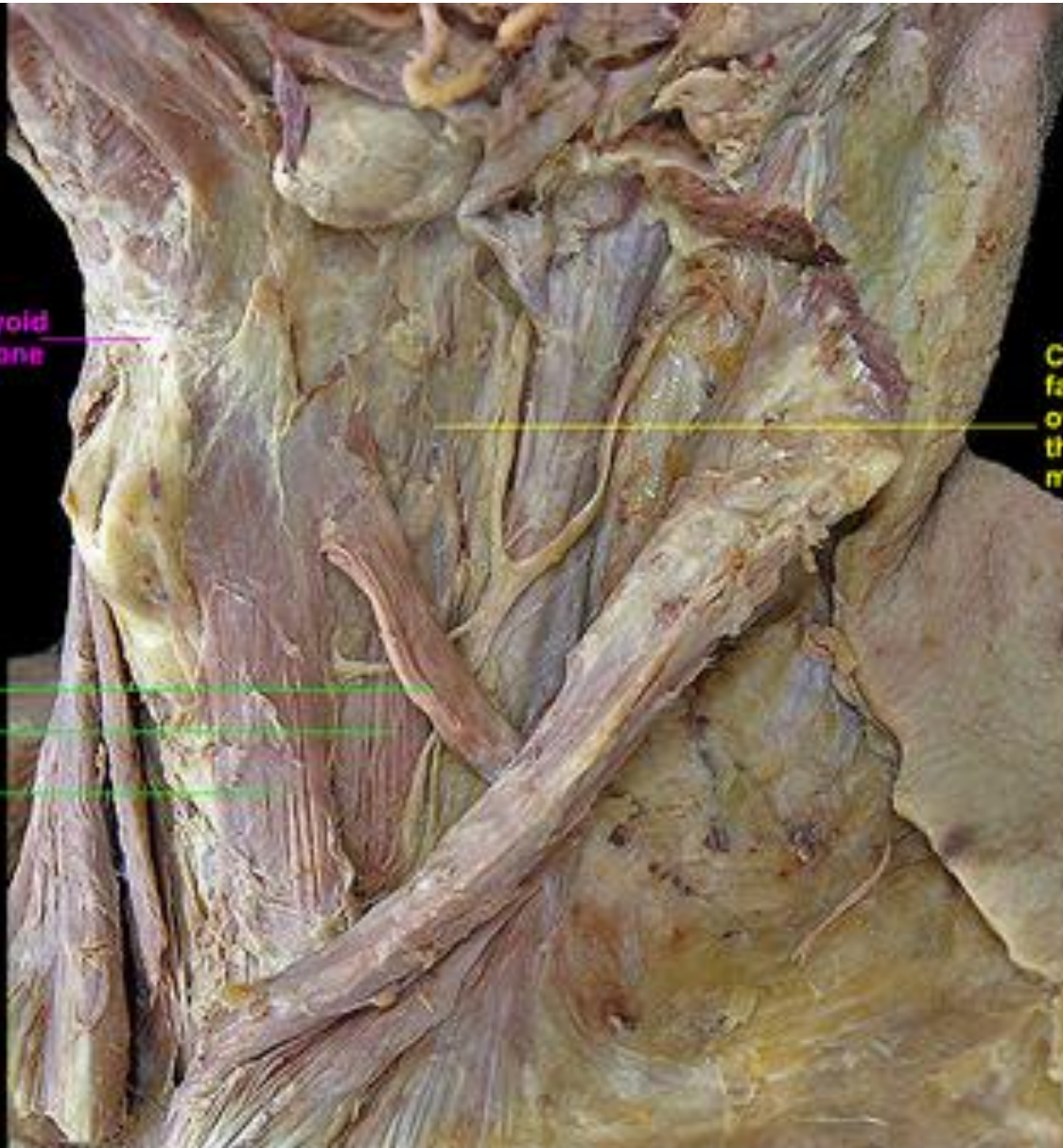
Pass the pointer over the "Notes"

Description 1

Labels

Menu Test

◀ ▶ #8



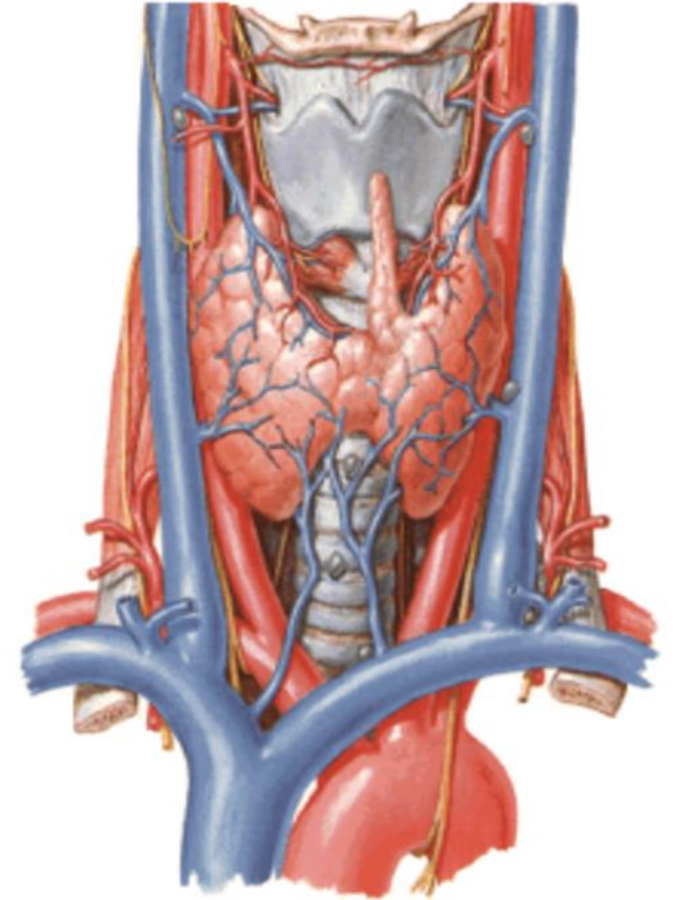
ARTERIAL SUPPLY

- Superior thyroid artery; branch of external carotid artery
- Inferior thyroid artery; branch of thyrocervical trunk
- Thyroidea ima artery; branch of brachiocephalic trunk or arch of aorta



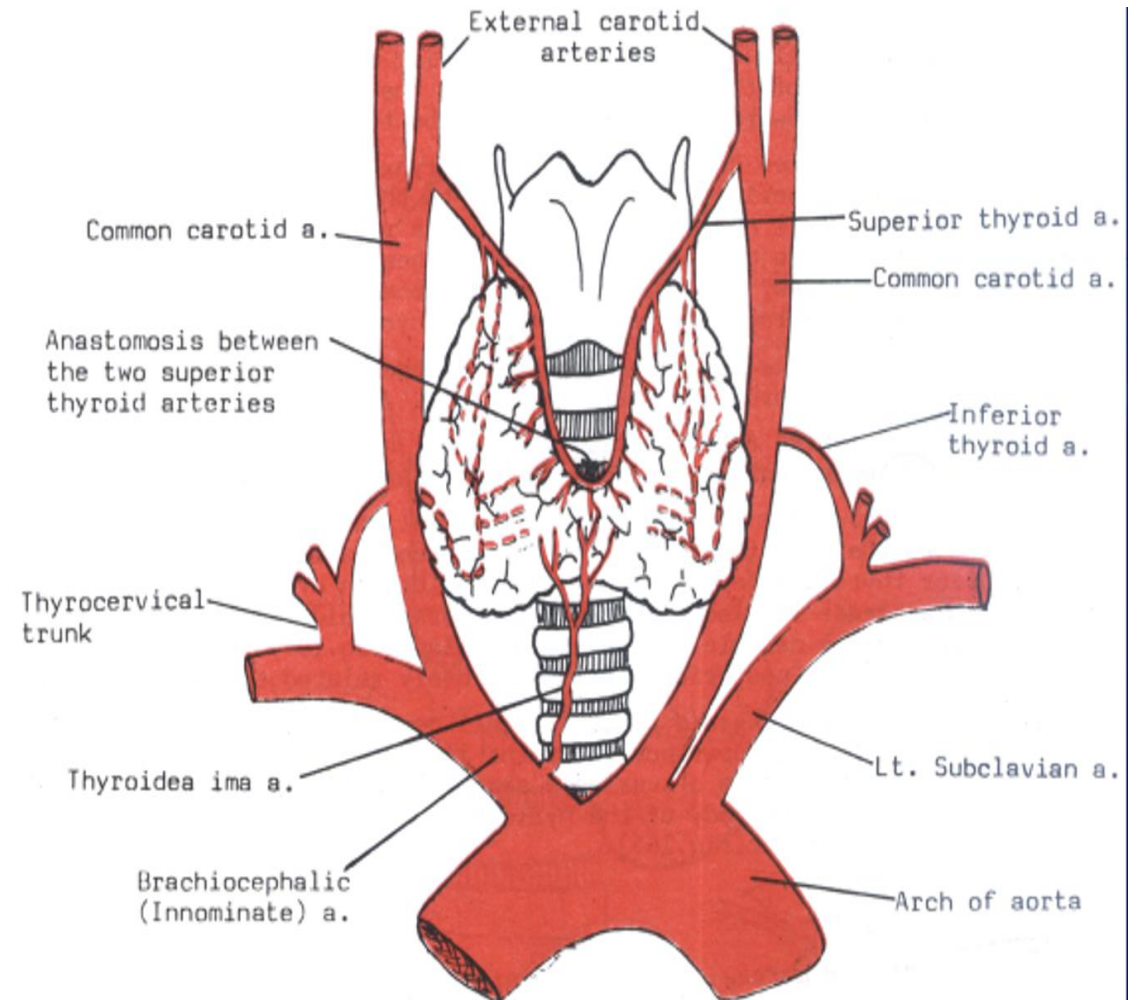
SUPERIOR THYROID ARTERY:

- It supplies:
 - Upper 1/3 of the lateral lobe.
 - Upper 1/2 of the isthmus.
- It is closely accompanied by:
 - Superior thyroid vein.
 - External laryngeal nerve.
- It terminates by dividing into anterior and posterior glandular branches:
 - Anterior branch: runs along anterior border of the lobe.
 - Posterior branch: descends on the posterior border of the lobe



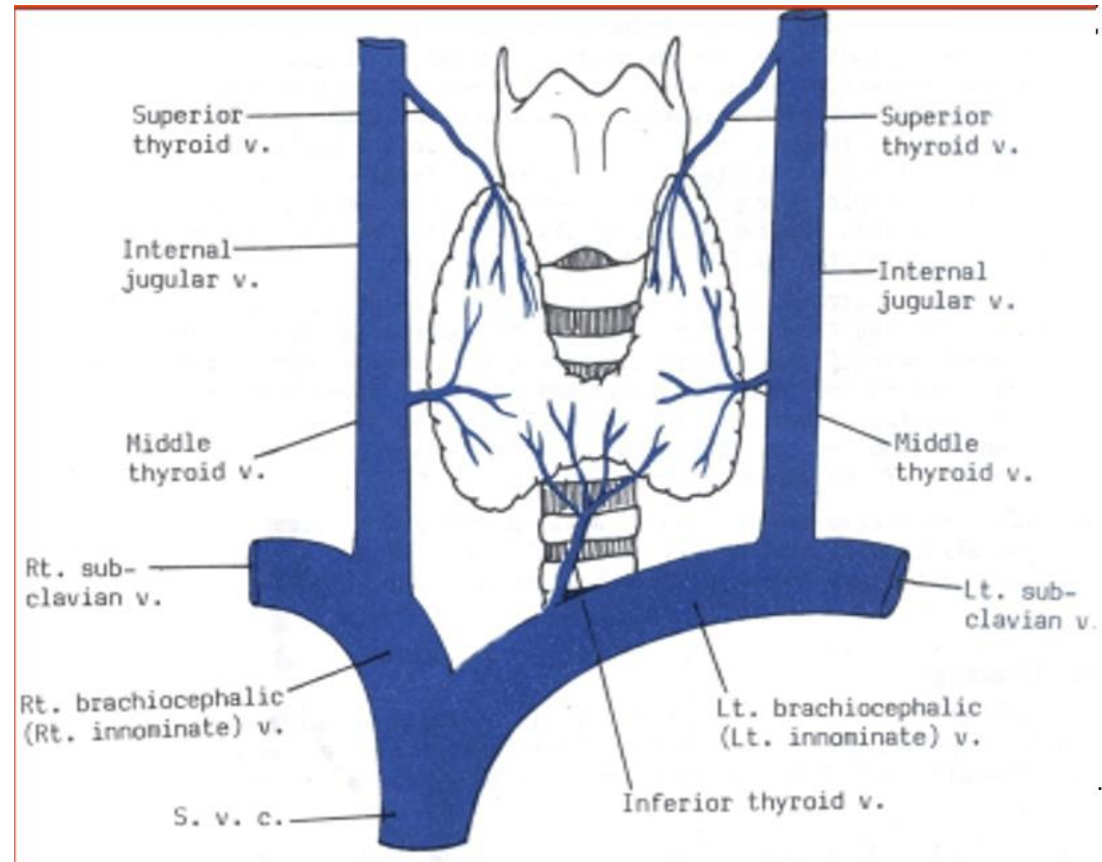
INFERIOR THYROID ARTERY:

- It supplies:
 - Lower 2/3 of the lateral lobe.
 - Lower 1/2 of the isthmus.
- The recurrent laryngeal nerve is related to the artery close to the gland.
- It gives an ascending branch that supplies the parathyroid glands and anastomoses with the posterior branch of the superior thyroid artery.
- Thyroidea ima artery:
It ascends in front of the trachea and supplies the isthmus of the gland.



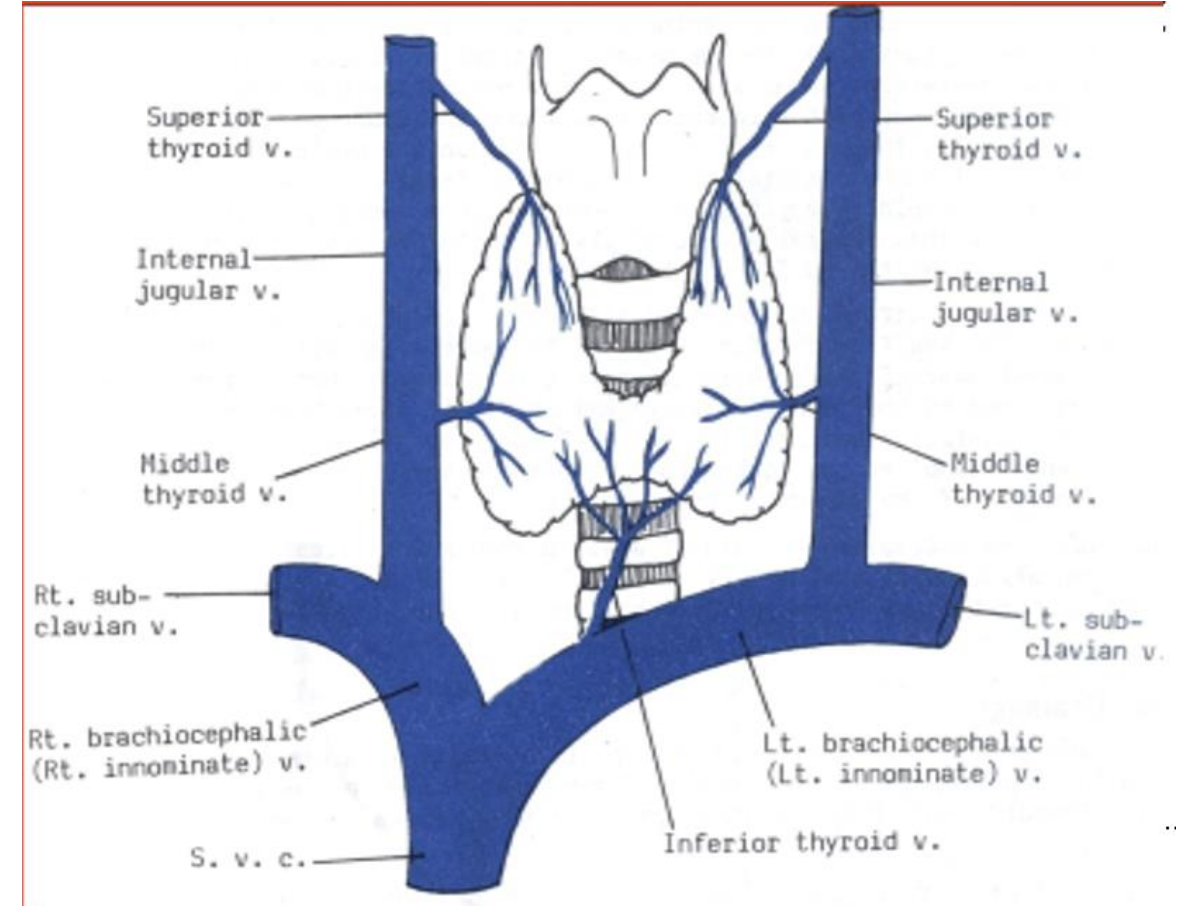
VENOUS DRAINAGE

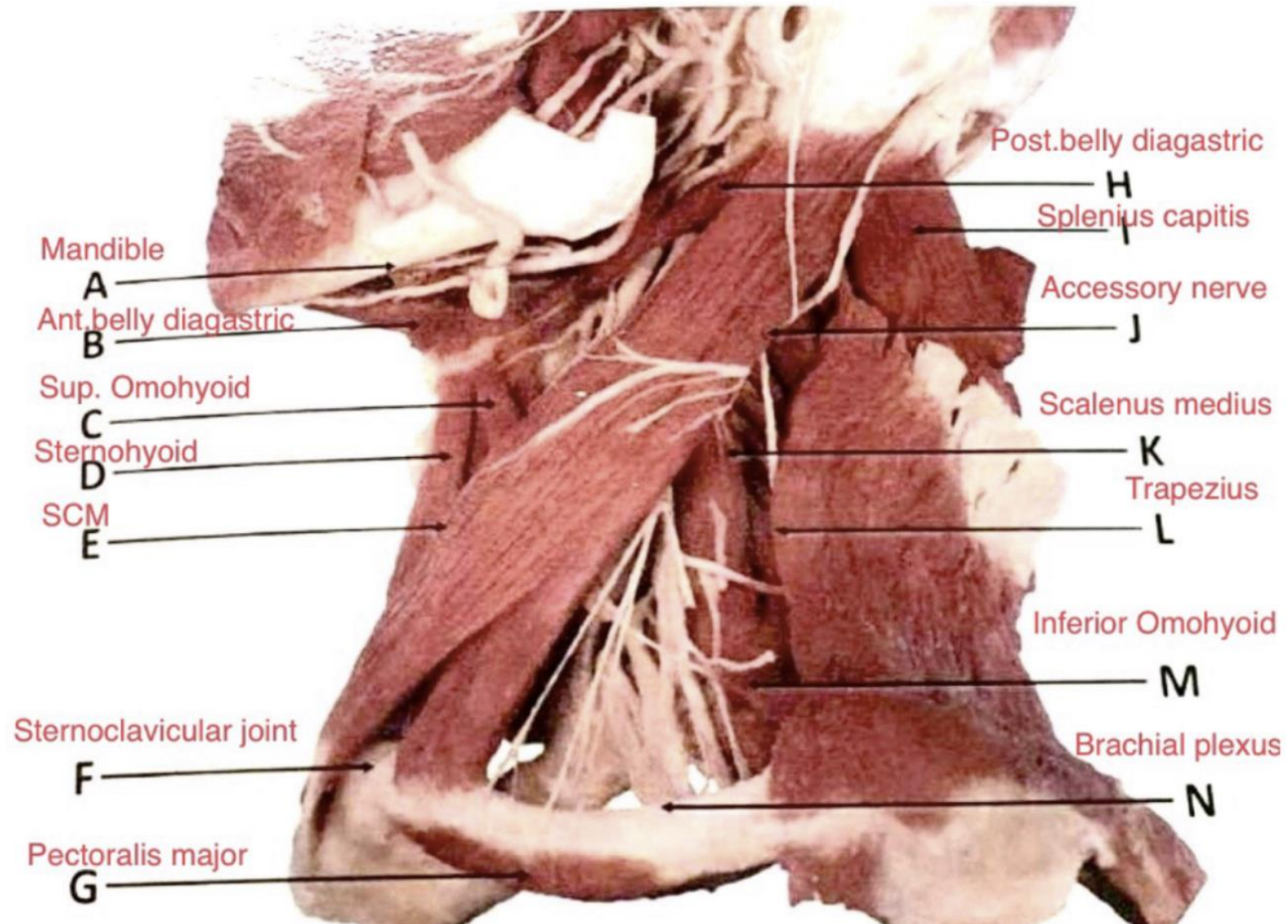
- The veins of the gland form a plexus on its surface, which gives rise to
- Superior thyroid vein:
- runs close to the superior thyroid A. & ends in the internal jugular vein.
- middle thyroid vein:
- Drains as well into the IJV



VENOUS DRAINAGE

- **Inferior thyroid vein:**
- 1-2 veins that arise from the lower parts of the isthmus and both lobes. It descends in front of trachea to open in **Lt. brachiocephalic vein.**

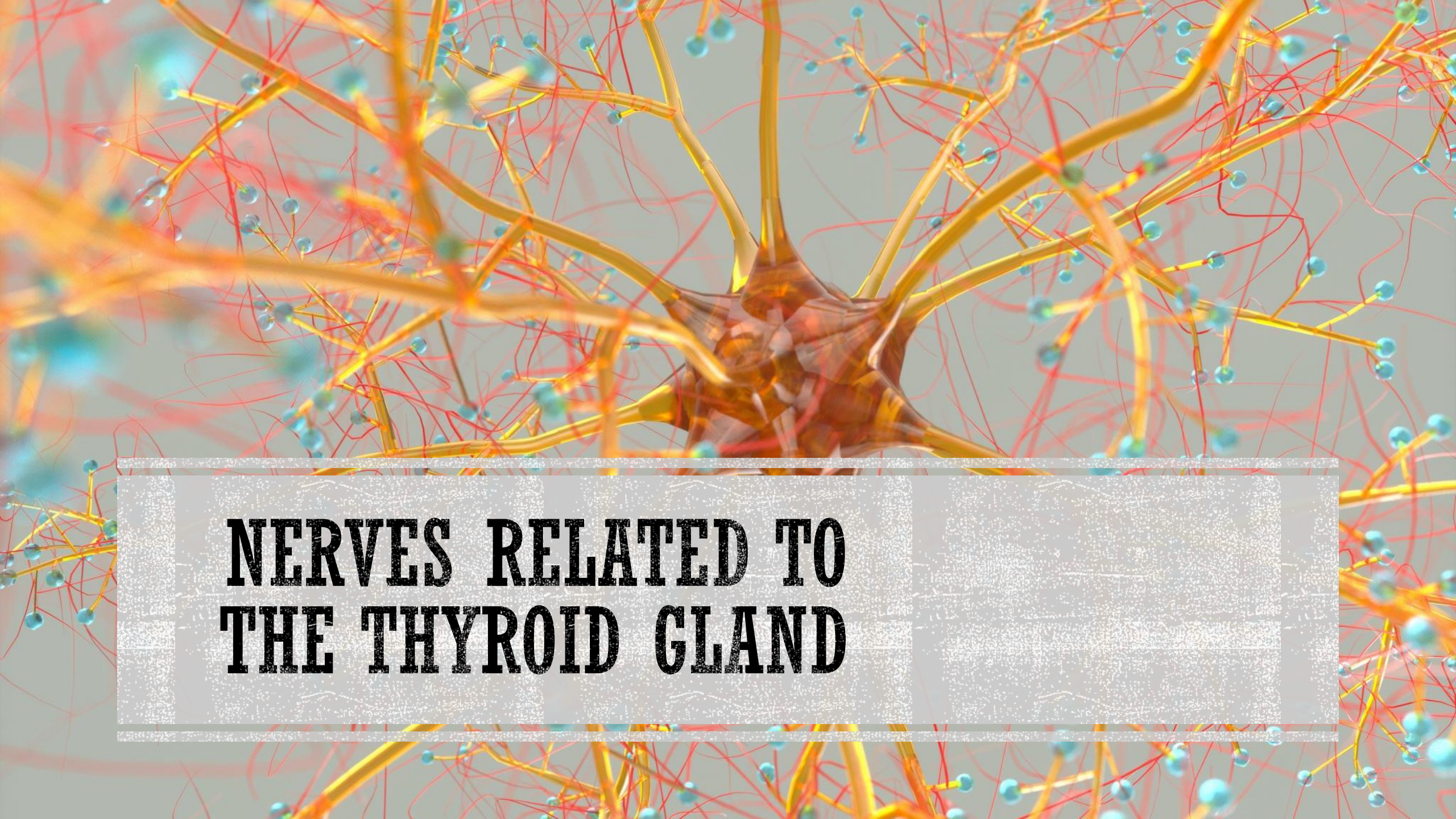






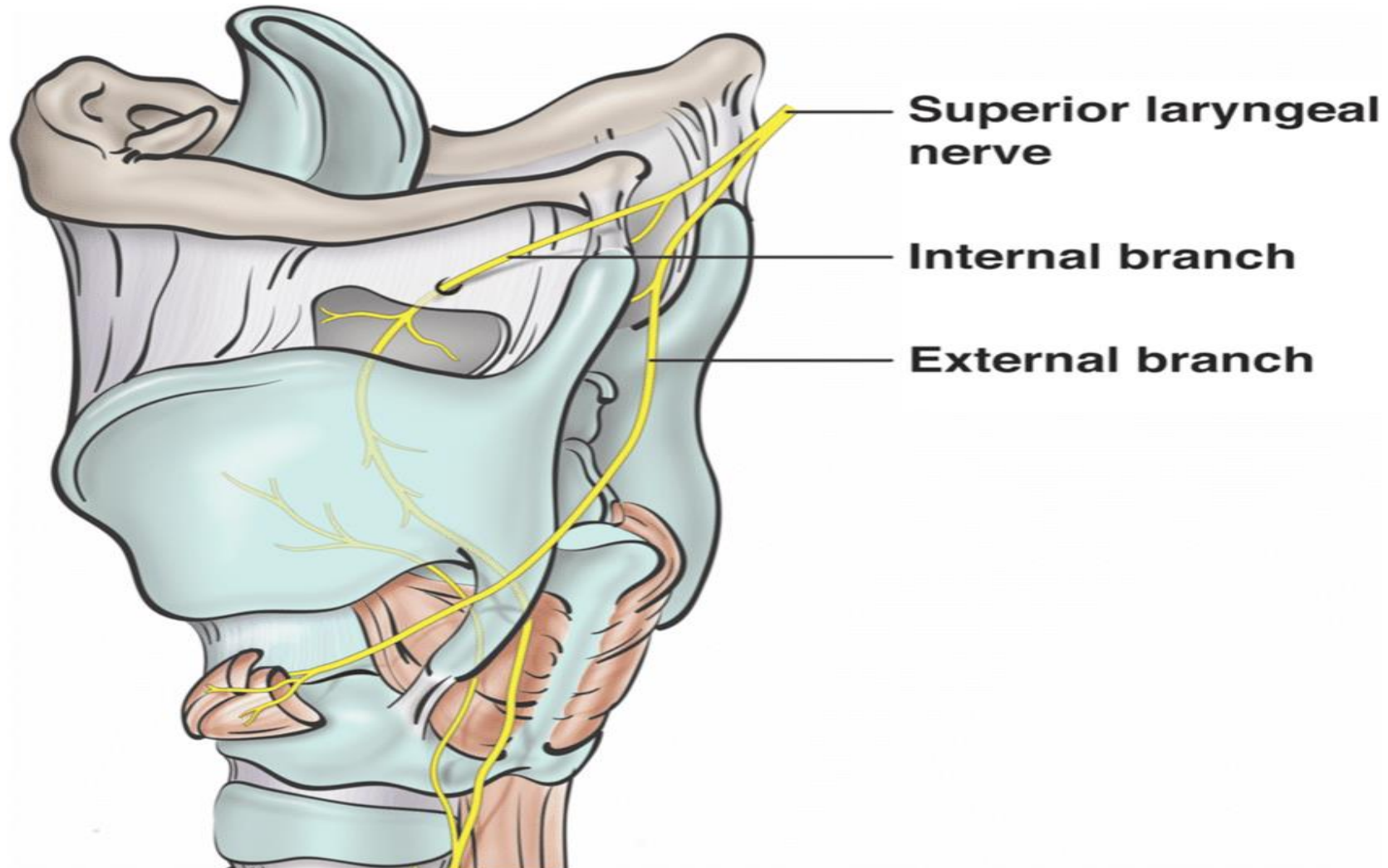
- | | |
|---|--|
| 1 Ansa cervicalis, inferior branch | 23 Mylohyoid |
| 2 Ansa cervicalis, superior branch | 24 Oblique line of the thyroid cartilage |
| 3 Anterior belly of digastric | 25 Parotid gland and facial nerve branches at anterior border |
| 4 Anterior jugular vein | 26 Platysma |
| 5 Brachial plexus (roots) | 27 Posterior belly of digastric |
| 6 Buccinator | 28 Retromandibular vein |
| 7 Common carotid artery | 29 Scalenus anterior |
| 8 Depressor anguli oris | 30 Sternocleidomastoid |
| 9 External carotid artery | 31 Sternohyoid |
| 10 External jugular vein | 32 Sternothyroid |
| 11 Facial artery | 33 Submandibular gland |
| 12 Facial vein | 34 Superior belly of omohyoid (bifid-variation) |
| 13 Great auricular nerve | 35 Superior laryngeal artery |
| 14 Greater horn of hyoid bone | 36 Superior thyroid artery |
| 15 Hyoid bone | 37 Suprascapular artery |
| 16 Hypoglossal nerve | 38 Thyrohyoid |
| 17 Internal jugular vein | 39 Thyrohyoid membrane |
| 18 Internal laryngeal nerve | 40 Thyroid gland (right lobe) |
| 19 Lesser occipital nerve | |
| 20 Levator scapulae | |
| 21 Mandible | |



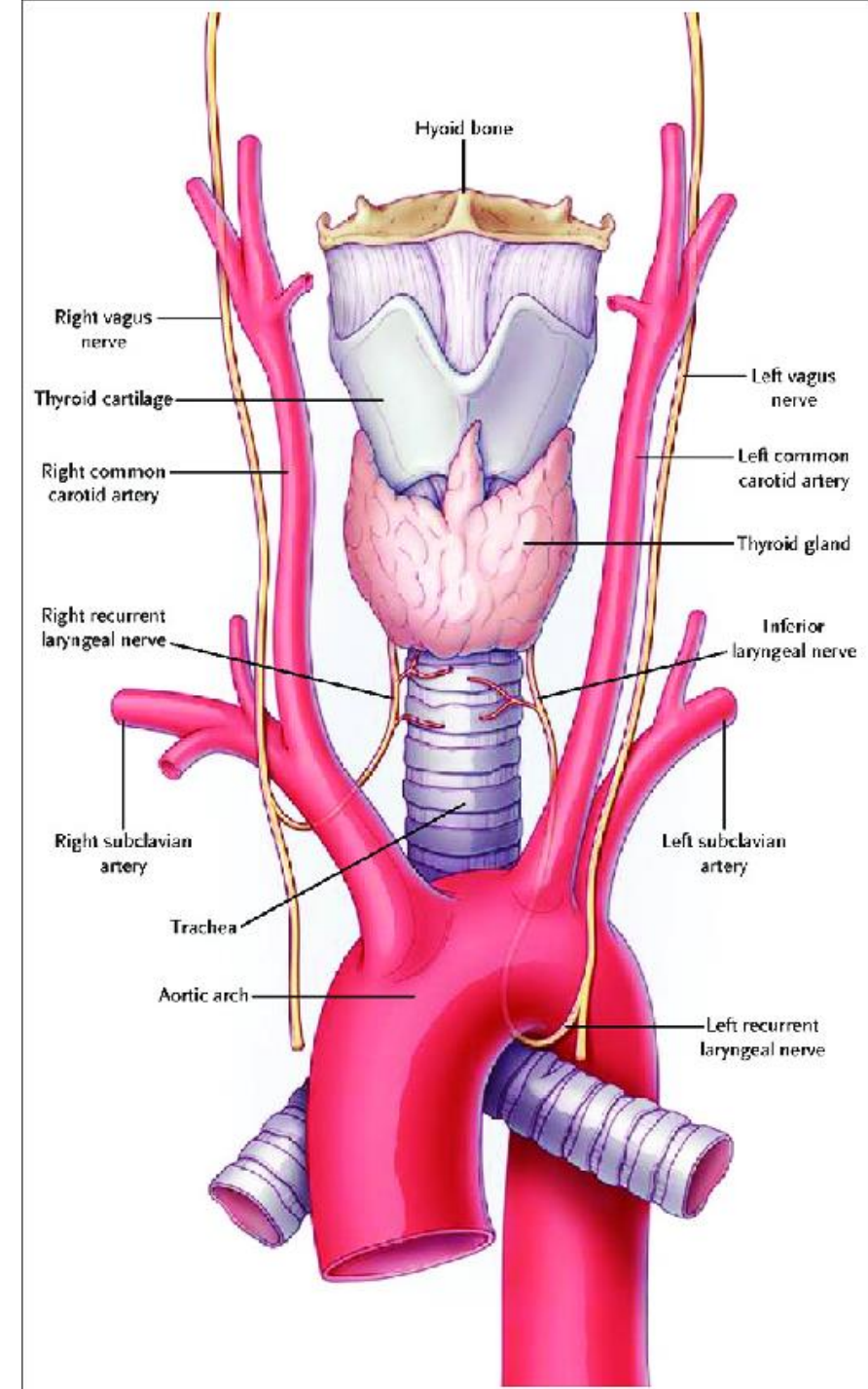
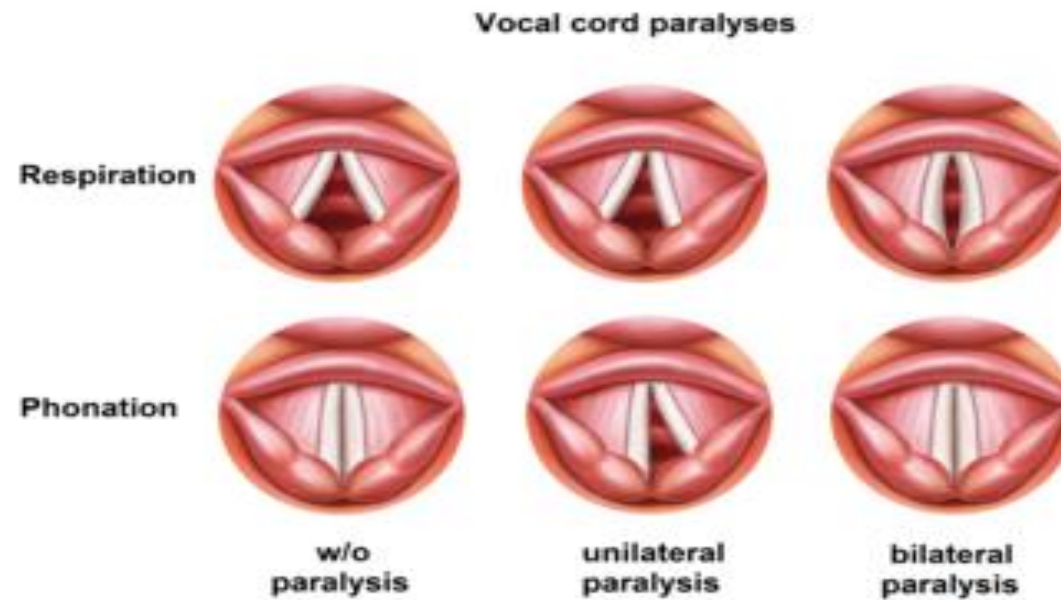


NERVES RELATED TO THE THYROID GLAND

SUPERIOR LARYNGEAL NERVE

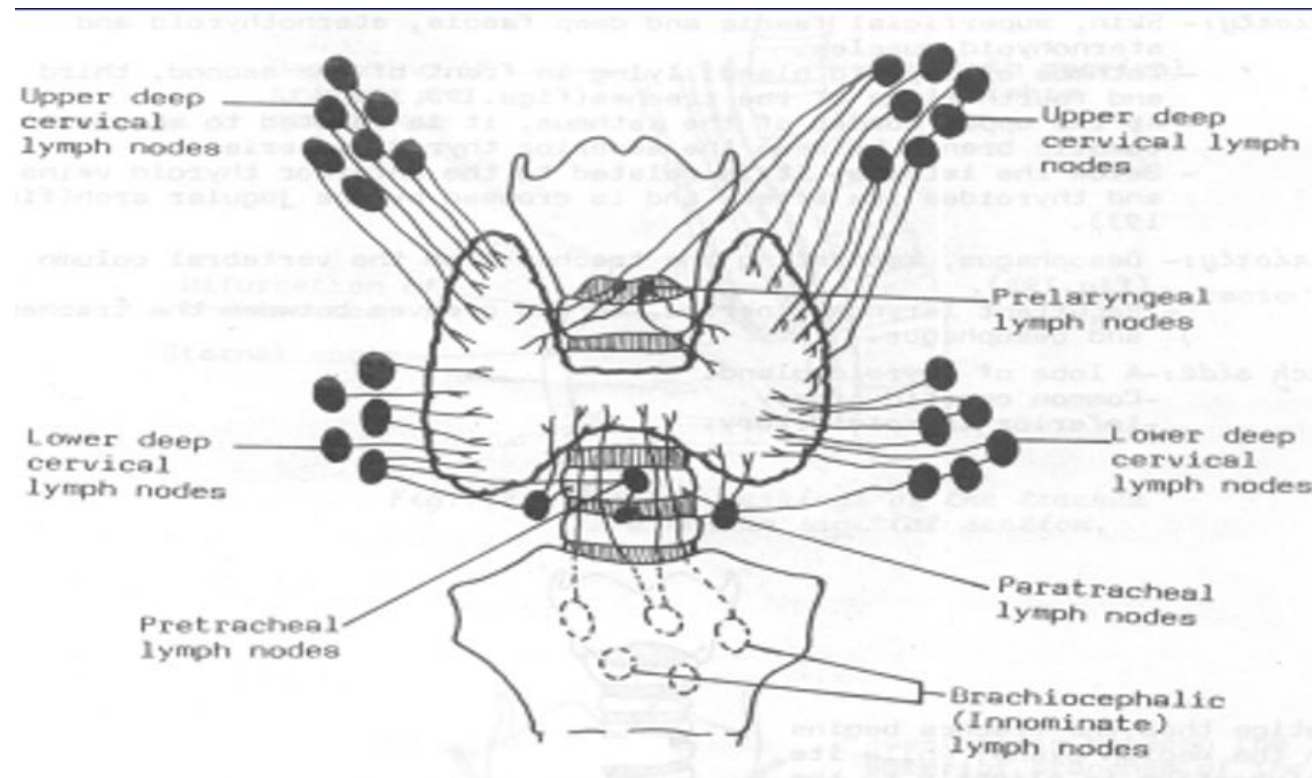


RECURRENT LARYNGEAL NERVE

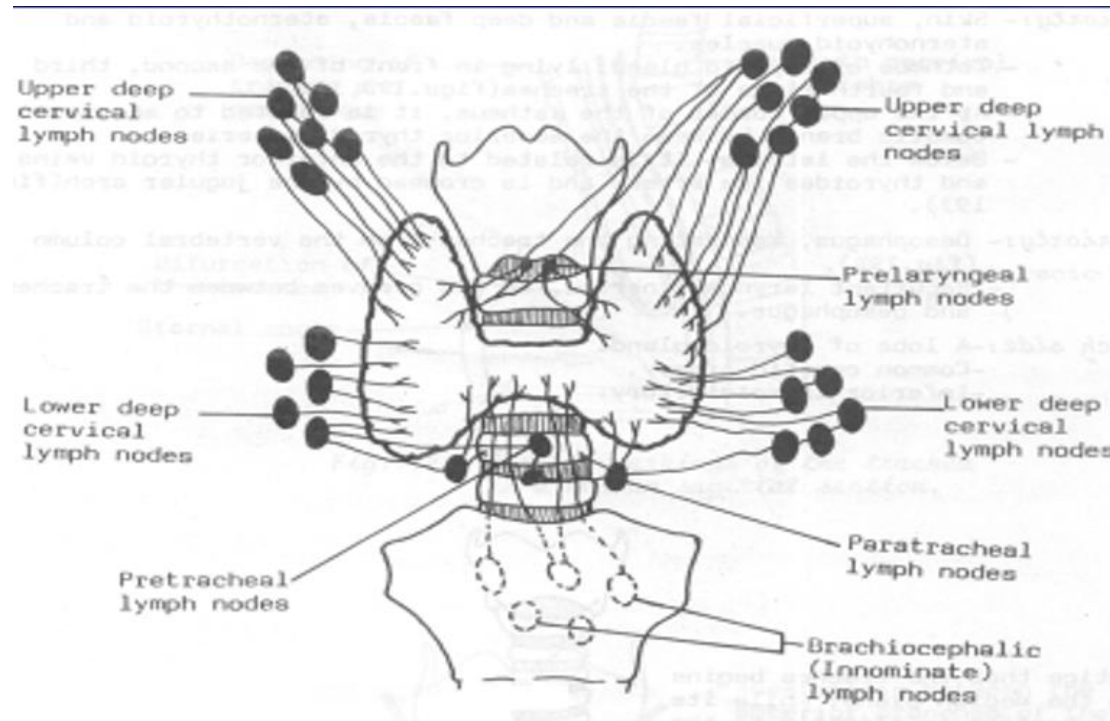


LYMPHATIC DRAINAGE:

- The upper part of the gland drains into the upper deep cervical L.Ns. (present along the I.J.V.).
- The lower part of the gland drains into the lower deep cervical L.Ns. (present along the I.J.V.).



- Some vessels drain in the
- Prelaryngeal L.Ns. -> in front of cricothyroid membrane.
- Pretracheal L.Ns. - in front of trachea.



PARATHYROID GLANDS

- These are 4 small yellowish ovoid glands; 2 on each side: superior & inferior.
- They measure about 6 mm long in their greatest diameter, weight 30 mg.
- They are intimately related to the posterior border of the thyroid gland, lying within its fascial capsule.



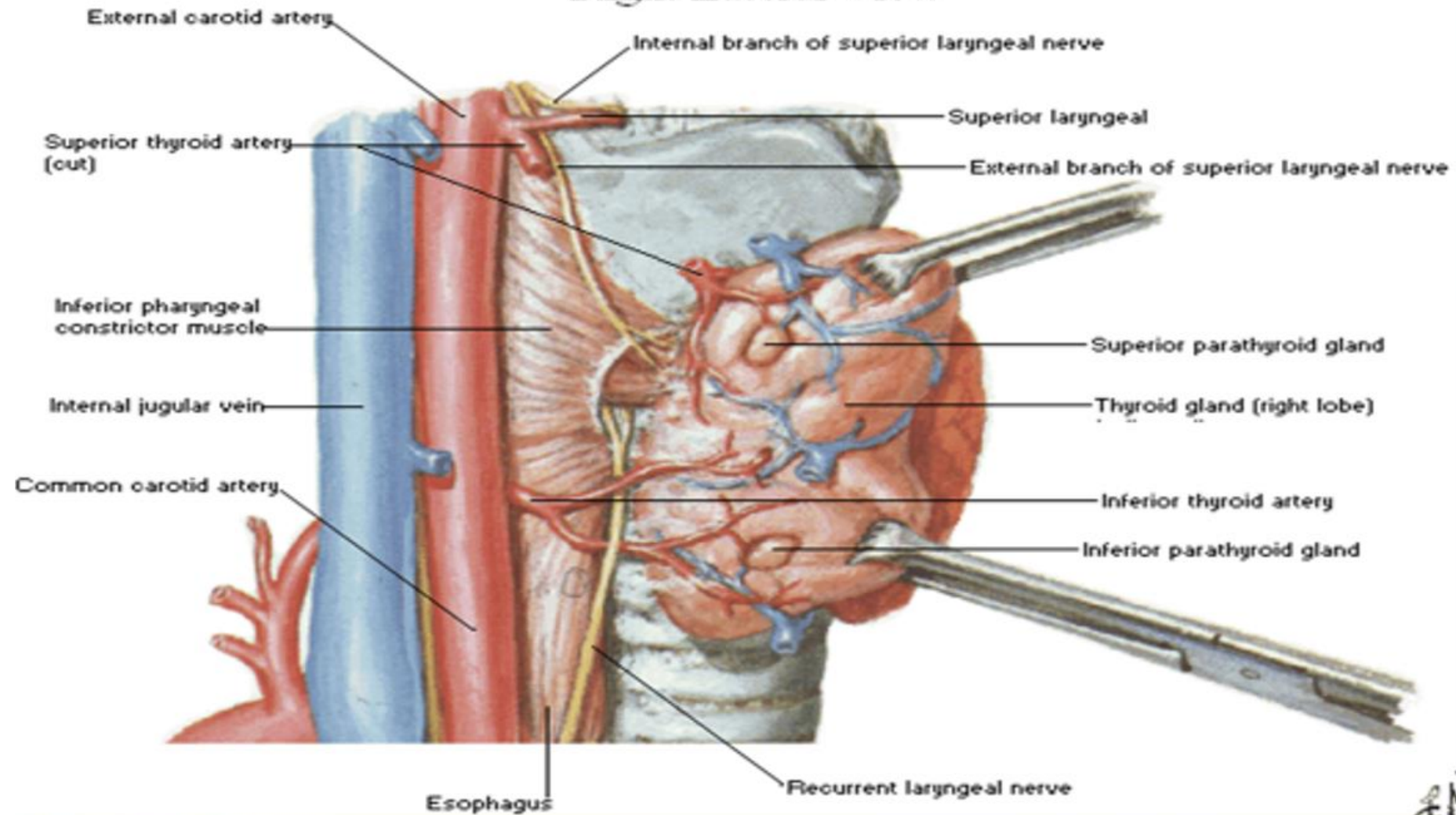
PARATHYROID GLANDS

- **The 2 superior parathyroid glands:** are the more constant in position and lie at the level of the middle of the posterior border of the thyroid gland.
- **The 2 inferior parathyroid glands:** usually lies near the base of the thyroid lobe, but it may be embedded in the substance of the thyroid gland or outside the thyroid capsule.
- The superior parathyroid gland originates from the fourth brachial pouch along with the ultimobranchial body that will contribute to the development of part of the thyroid gland. The inferior parathyroid glands originate from the third brachial pouch along with the thymus.

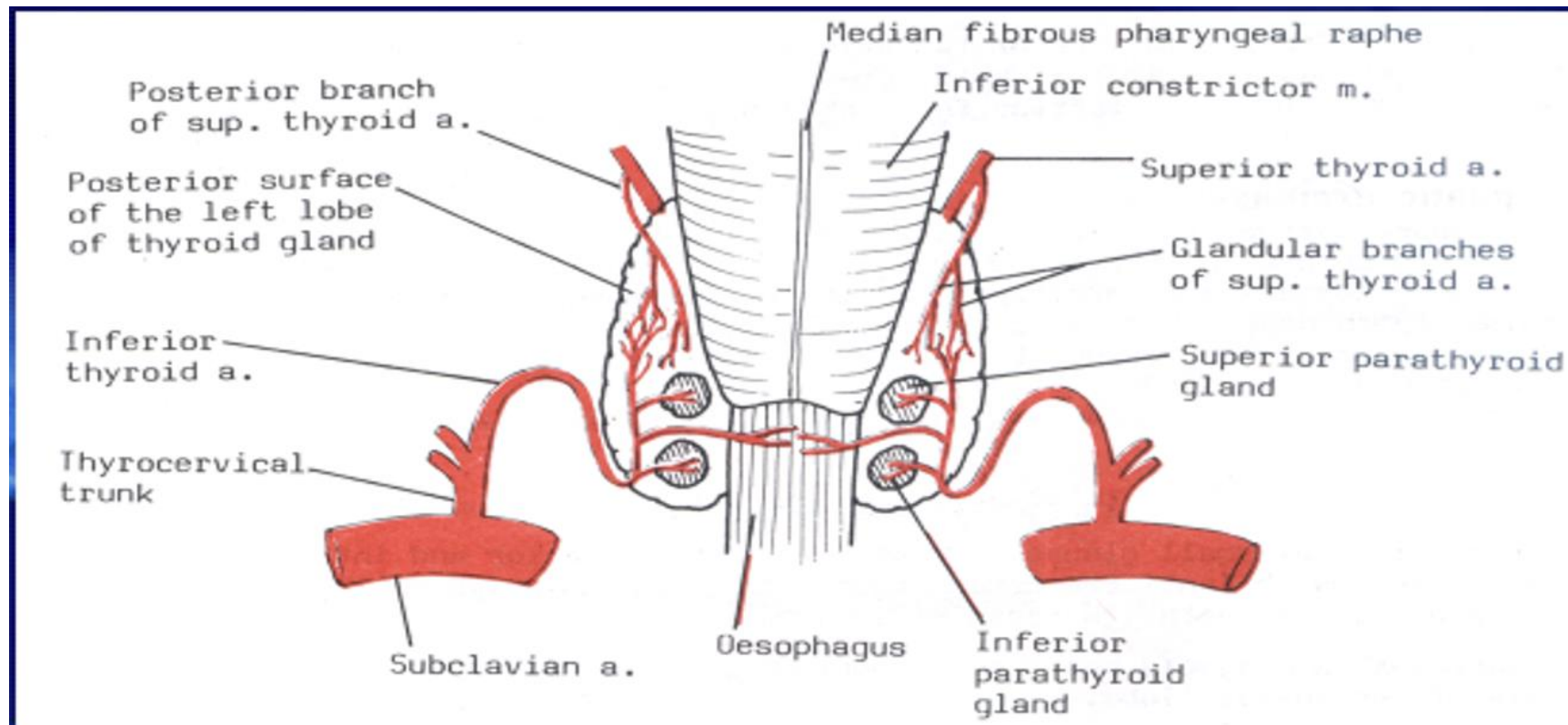


Parathyroid Glands

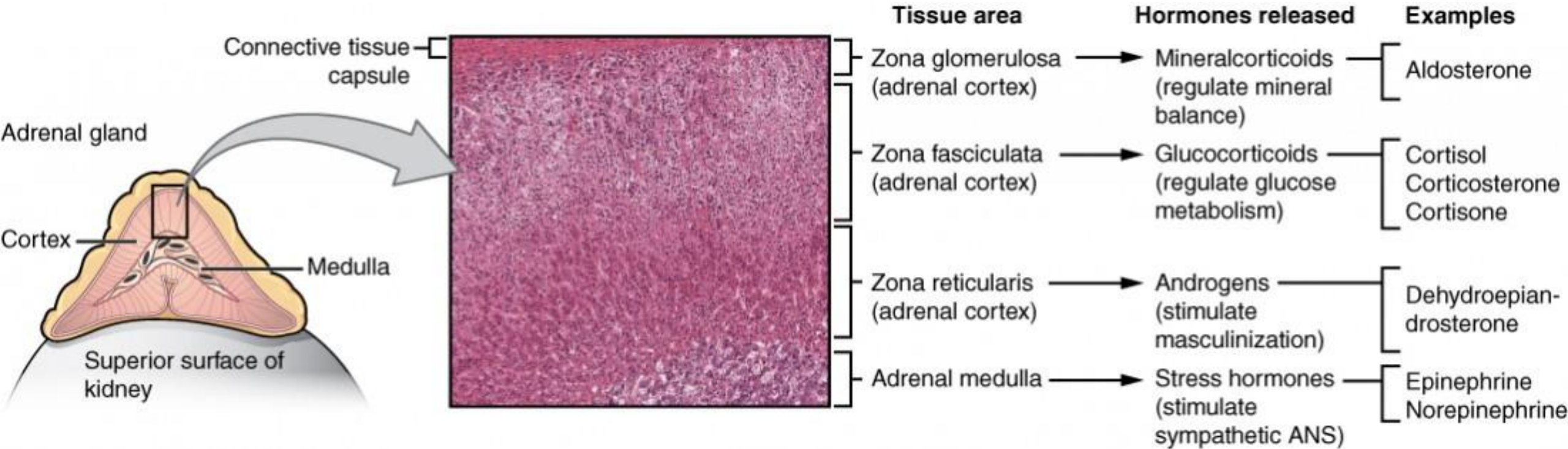
Right Lateral View



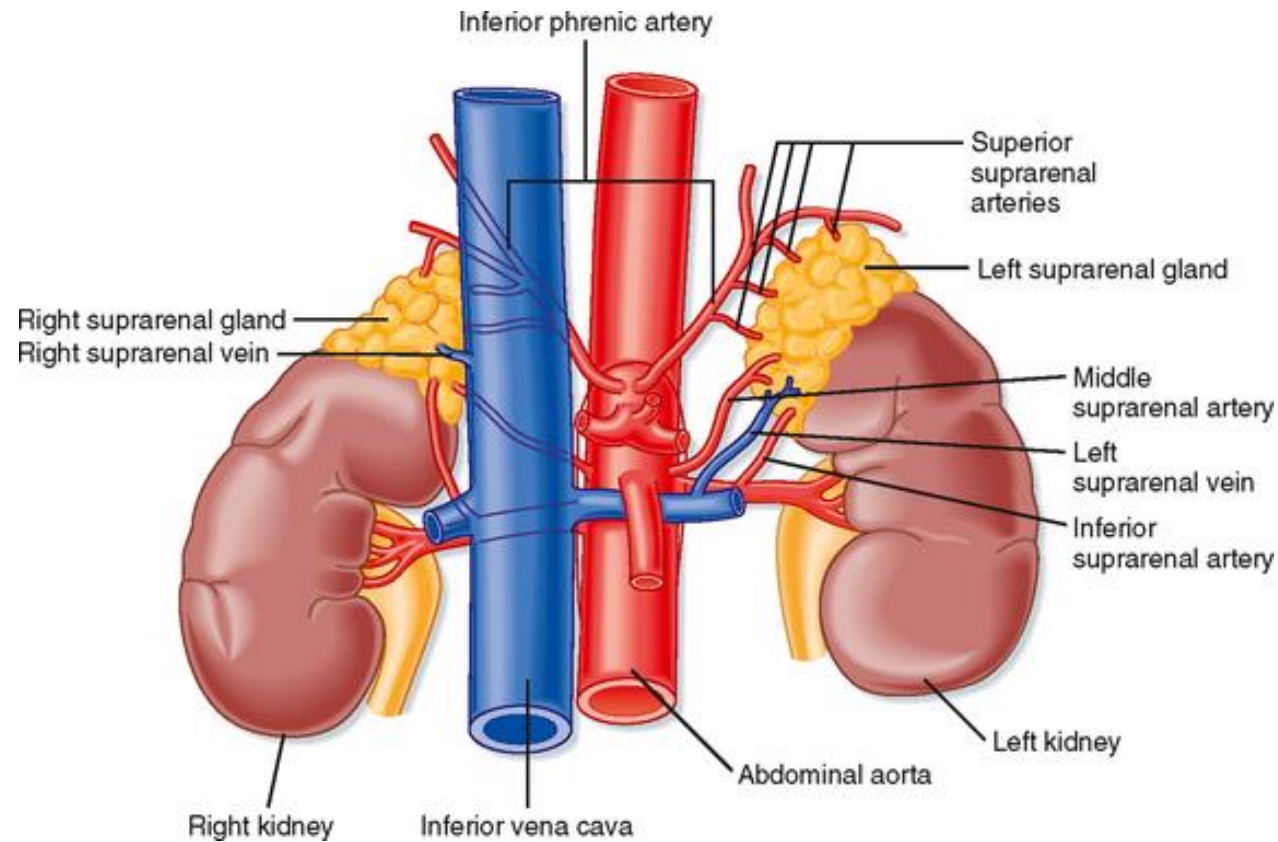
- **Arterial supply:** are supplied by the **inferior thyroid arteries**.
- **Venous drainage:** into the inferior thyroid veins.
- **Lymphatic drainage:** into the lower deep cervical L.Ns.
- Some lymphatics are drained in the paratracheal L.Ns



ADRENAL GLAND



BLOOD SUPPLY AND VENOUS DRAINAGE



Any Questions ?

