

Thyroid Gland

* **Site & Shape:**

- It is an endocrinal gland , lies in the lower part of front of the neck.
- It is butterfly in shape & formed of 2 lateral lobes connected together by an isthmus.
- Each lobe is pyramidal in shape, its apex reaches the oblique line of thyroid cartilage (The gland can not enlarge above this line due to the attachment of sternothyroid muscle), its base reaches the level of 5th or 6th tracheal ring.
- The isthmus lies opposite 2, 3, 4 tracheal rings.

* **Capsule:**

- It has a fibrous capsule which is separated from the pre-tracheal fascia (thyroid sheath) by a network of nerve fibers and anastomosing vessels (thyroid plexus) .
- It is enclosed within the pre-tracheal fascia which is attached upwards to the thyroid cartilage & hyoid bone (so moves with deglutation). There is thickening of this fascia that fix the back of each lobe to cricoid cartilage (ligament of Berry).

* **Surfaces & relations:**

1. **Antero-lateral surface:**

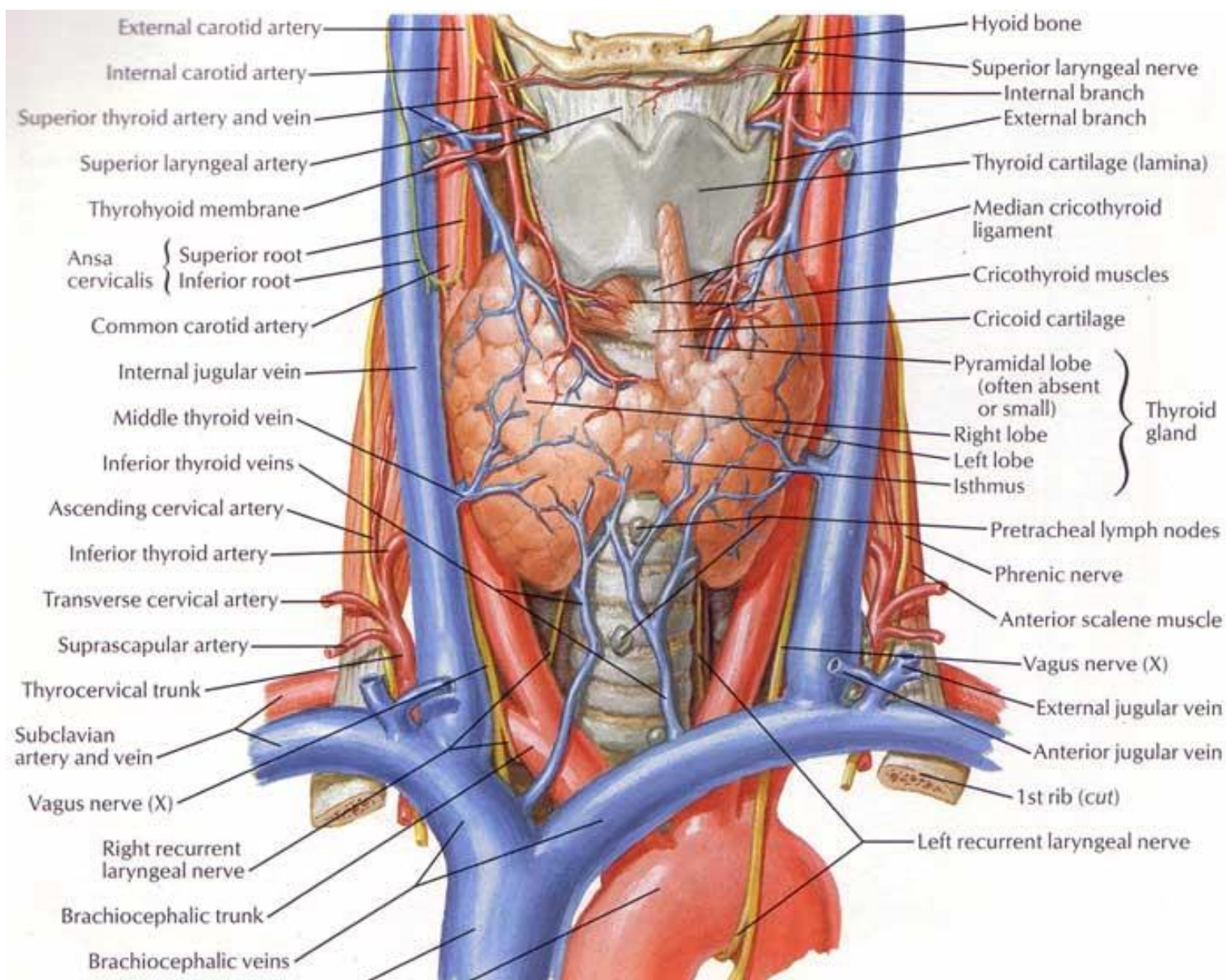
Related to sternohyoid, sternothyroid, superior belly of omohyoid & sternomastoid muscles.

2. **Medial surface:**

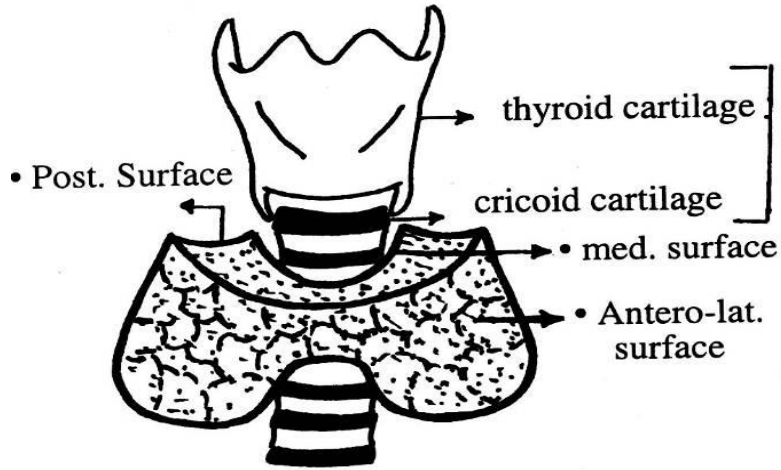
a) **Above:** 2 cartilages (thyroid & cricoid), 2 muscles (cricothyroid & inferior constrictor of pharynx).

b) **Below:** Esophagus., trachea, R.L.N.

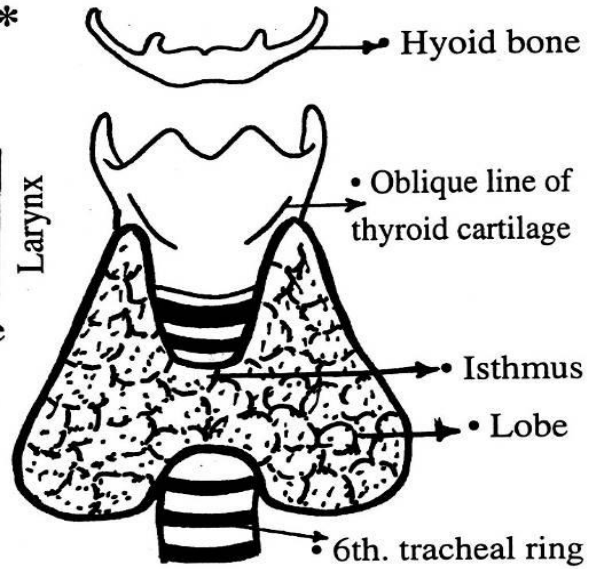
3. **Posterior surface:** Common carotid artery, inferior thyroid artery & parathyroid glands.



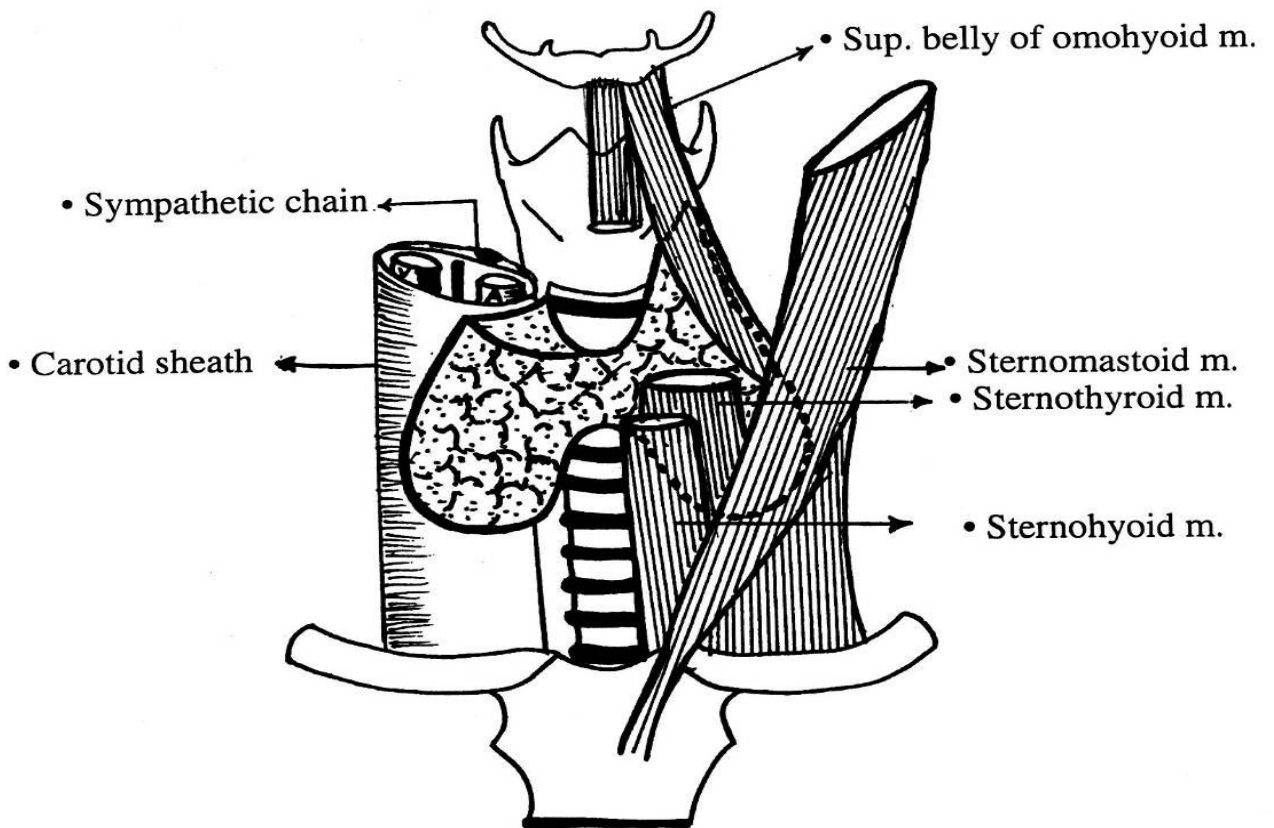
*** Thyroid Gland ***



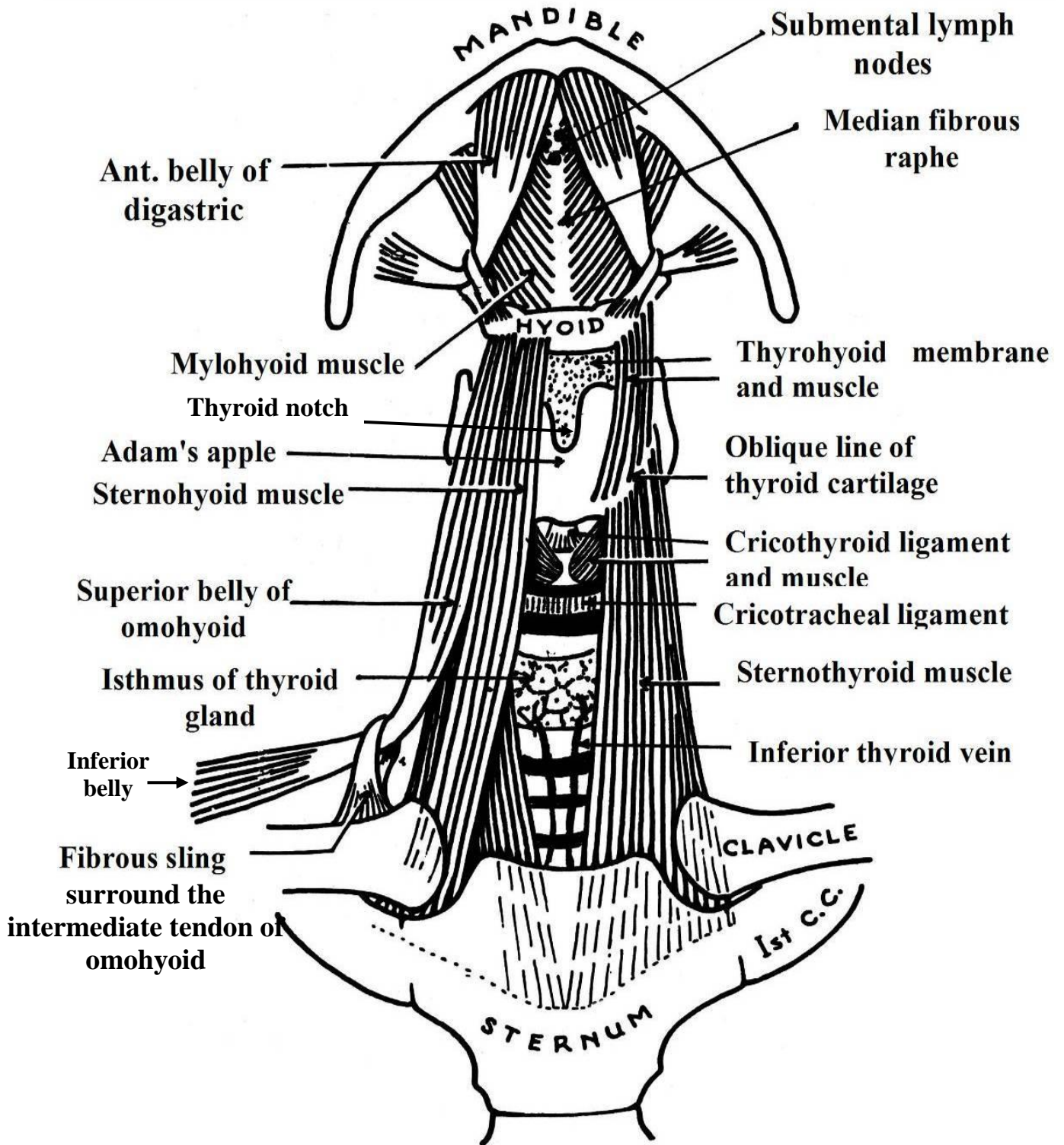
Surfaces



Parts, Shape and Level

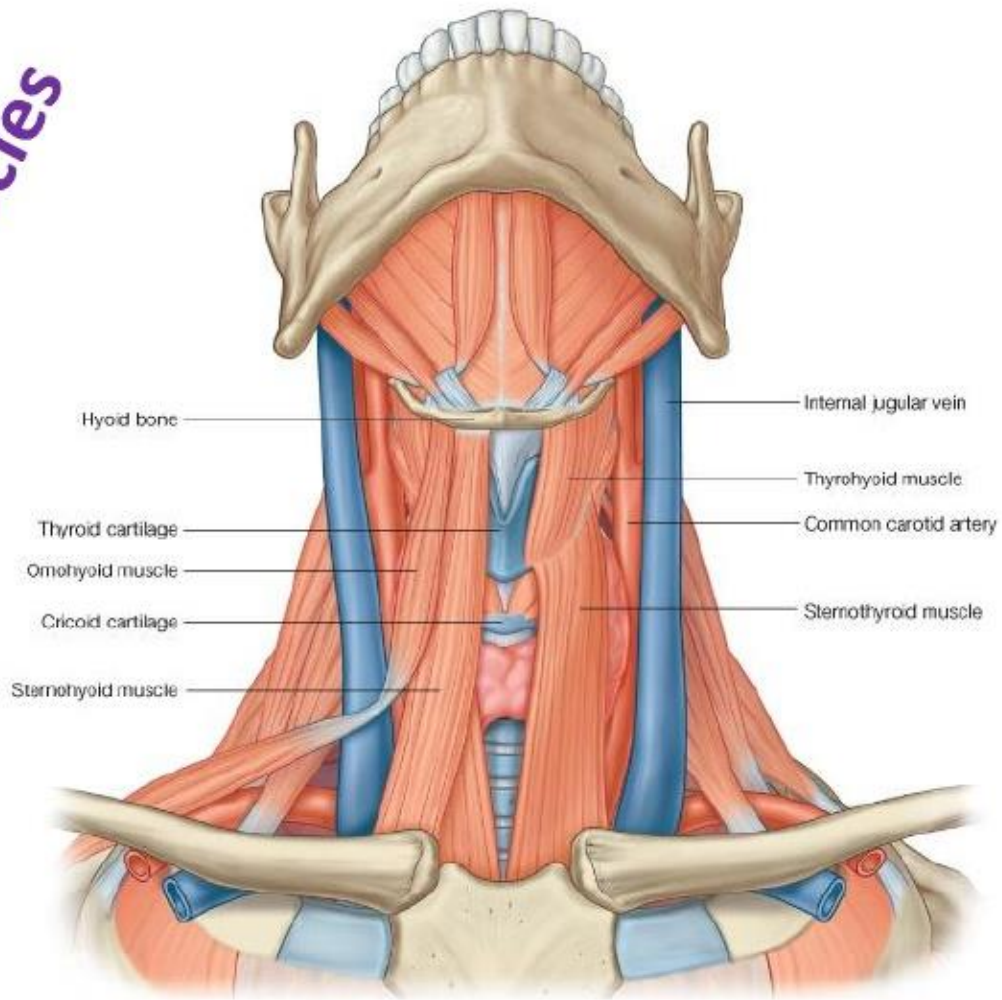


Relations Of Anterolat. & Post. Surfaces

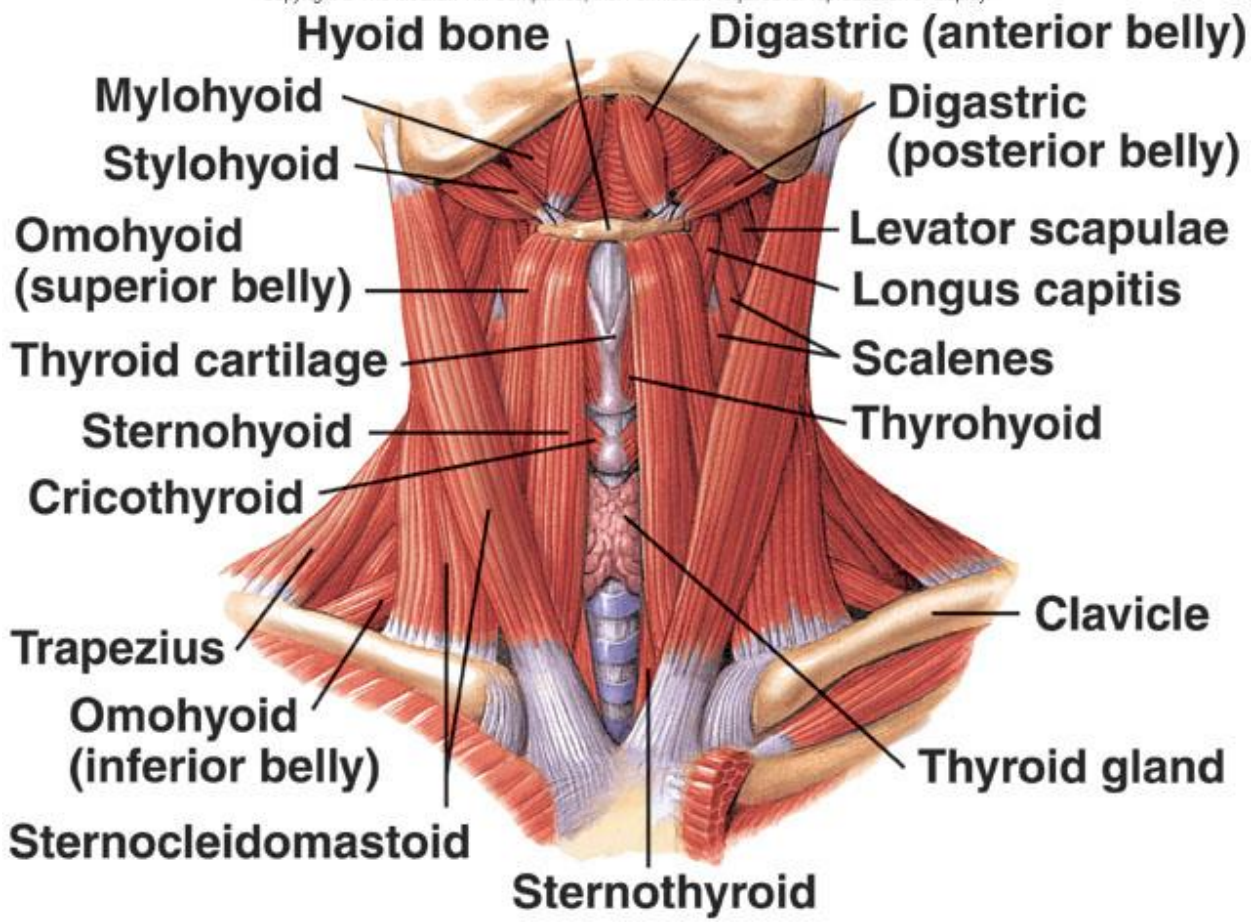


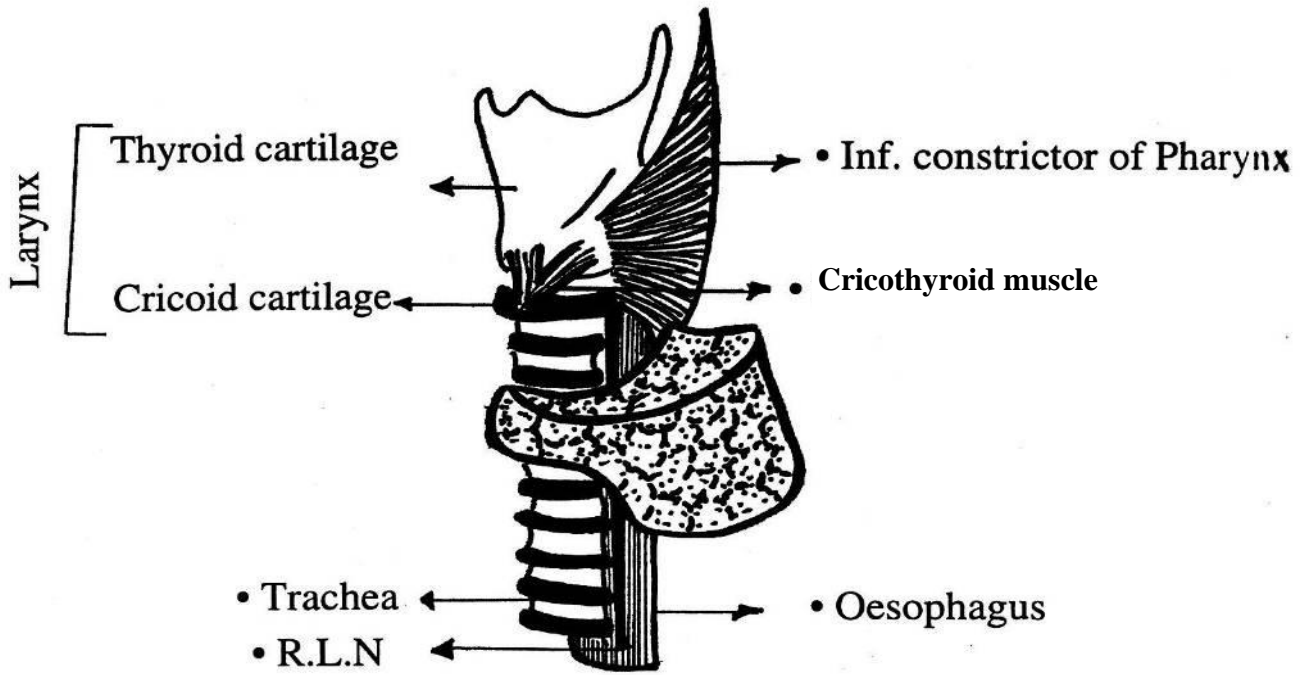
*Submental and Muscular Triangles
Infrahyoid Muscles
Median Region in front of Neck*

Infrathyoid muscles

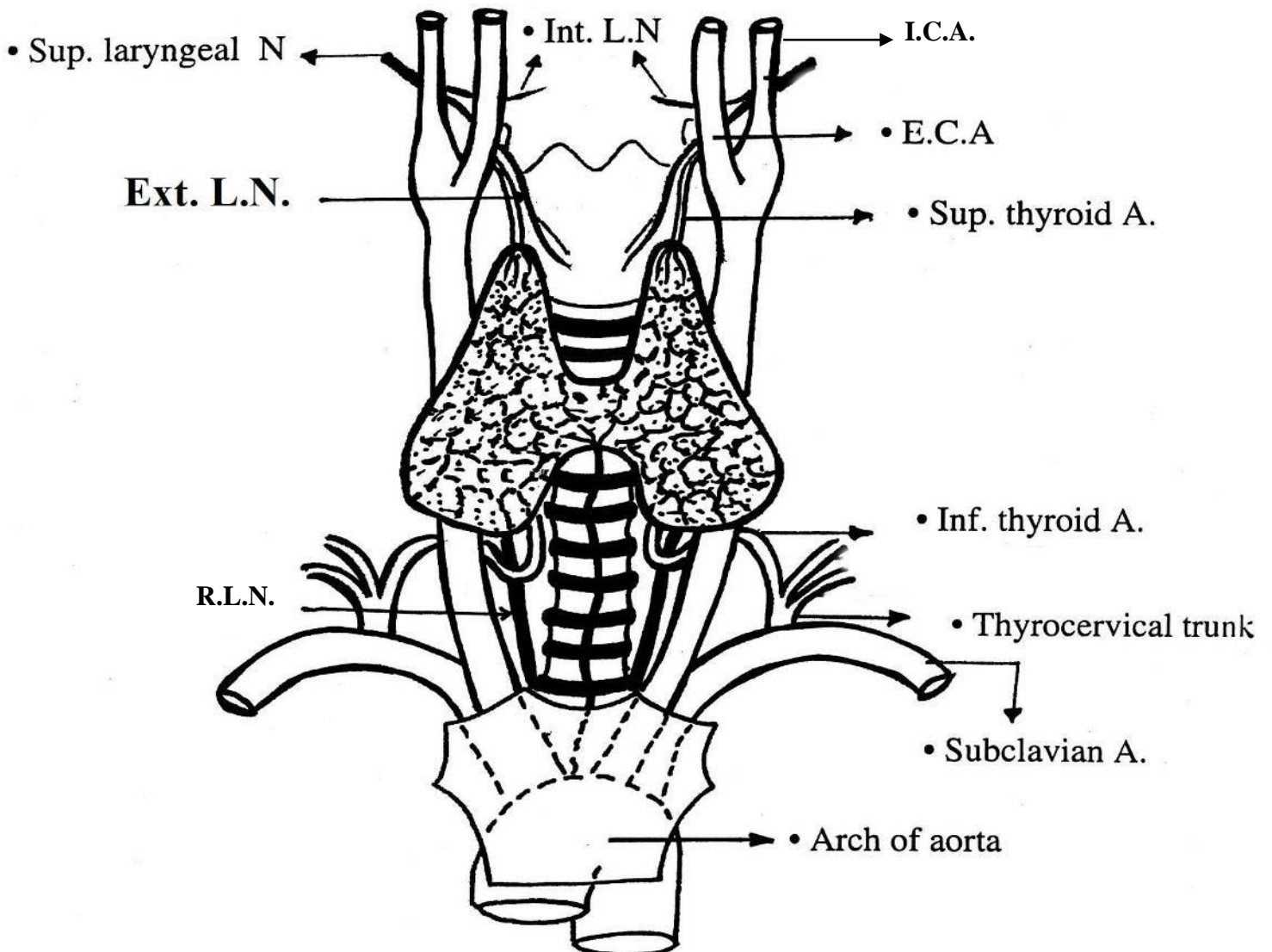


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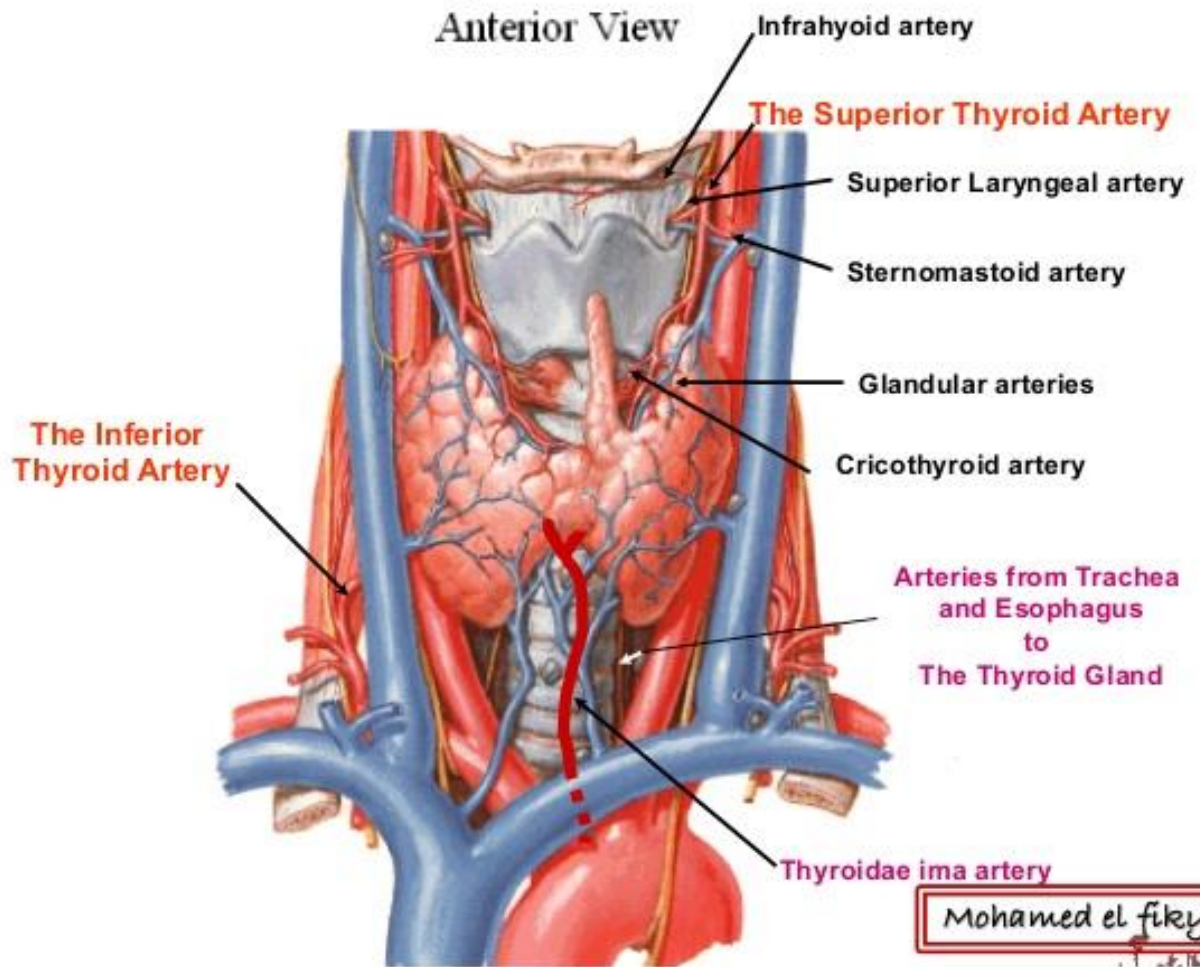
Relations of medial surface



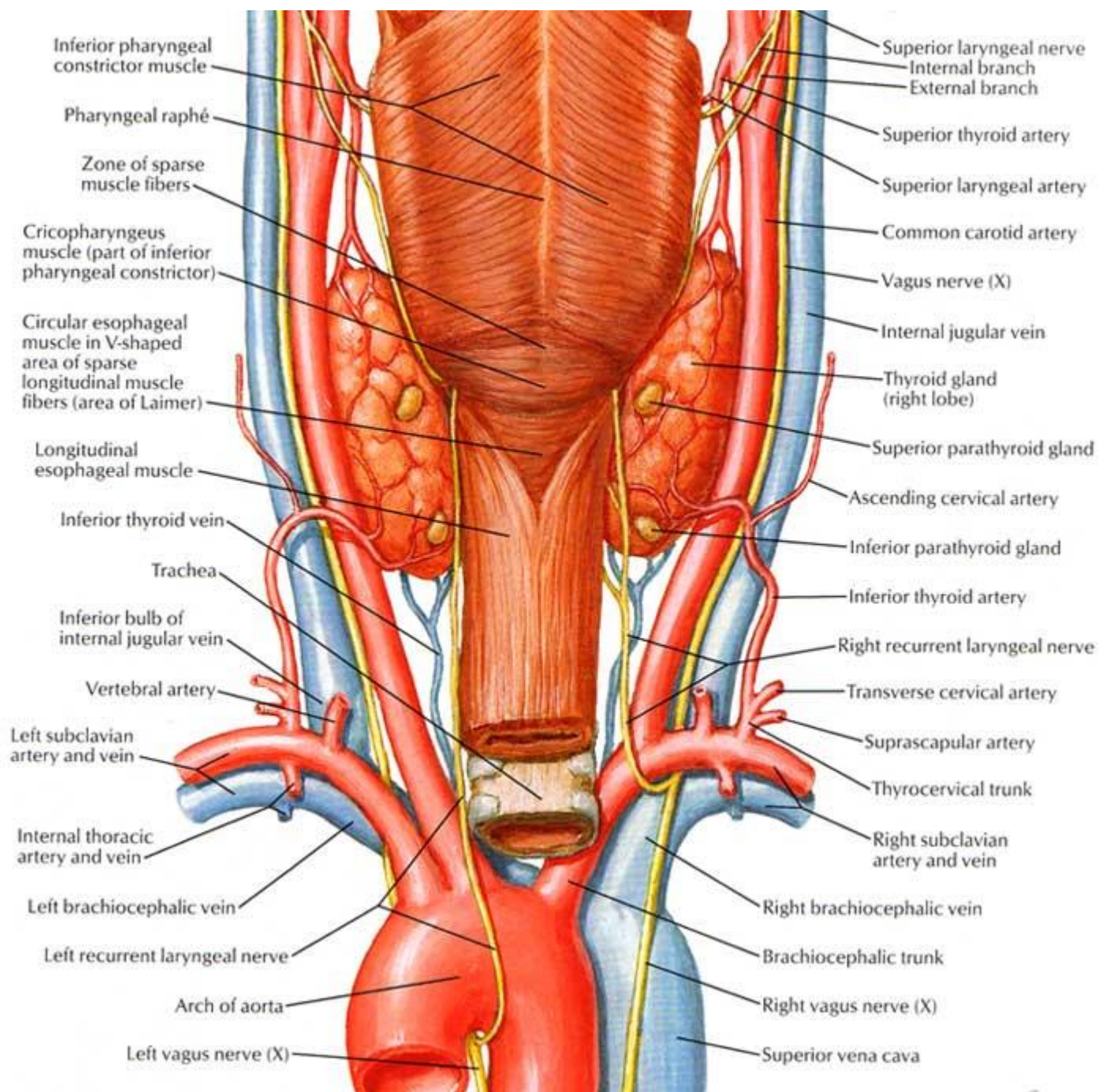
Arterial Supply & Nerves Related To Thyroid Gland

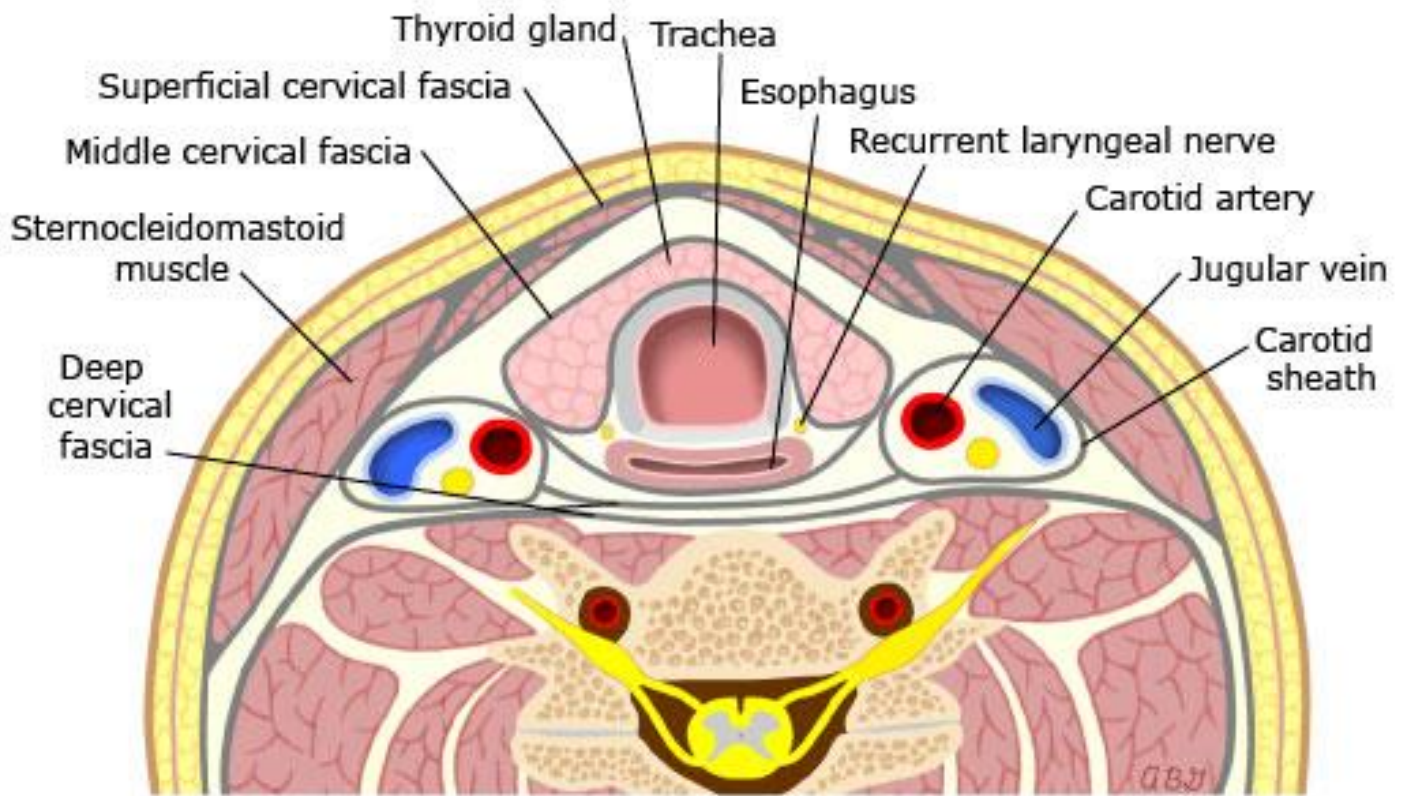
Thyroid Gland

Anterior View



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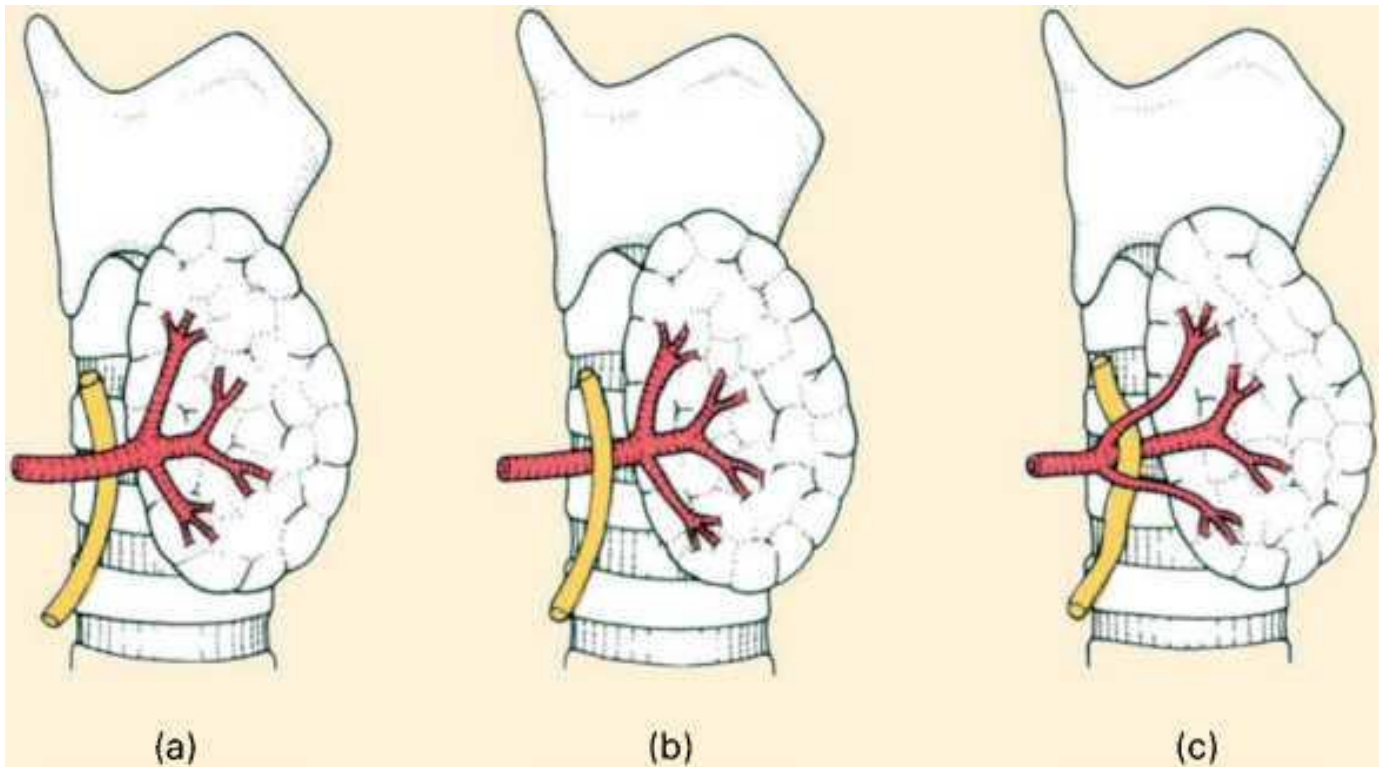


***T.S in the neck showing relations of thyroid gland ***

★ Blood Supply of the Thyroid Gland:

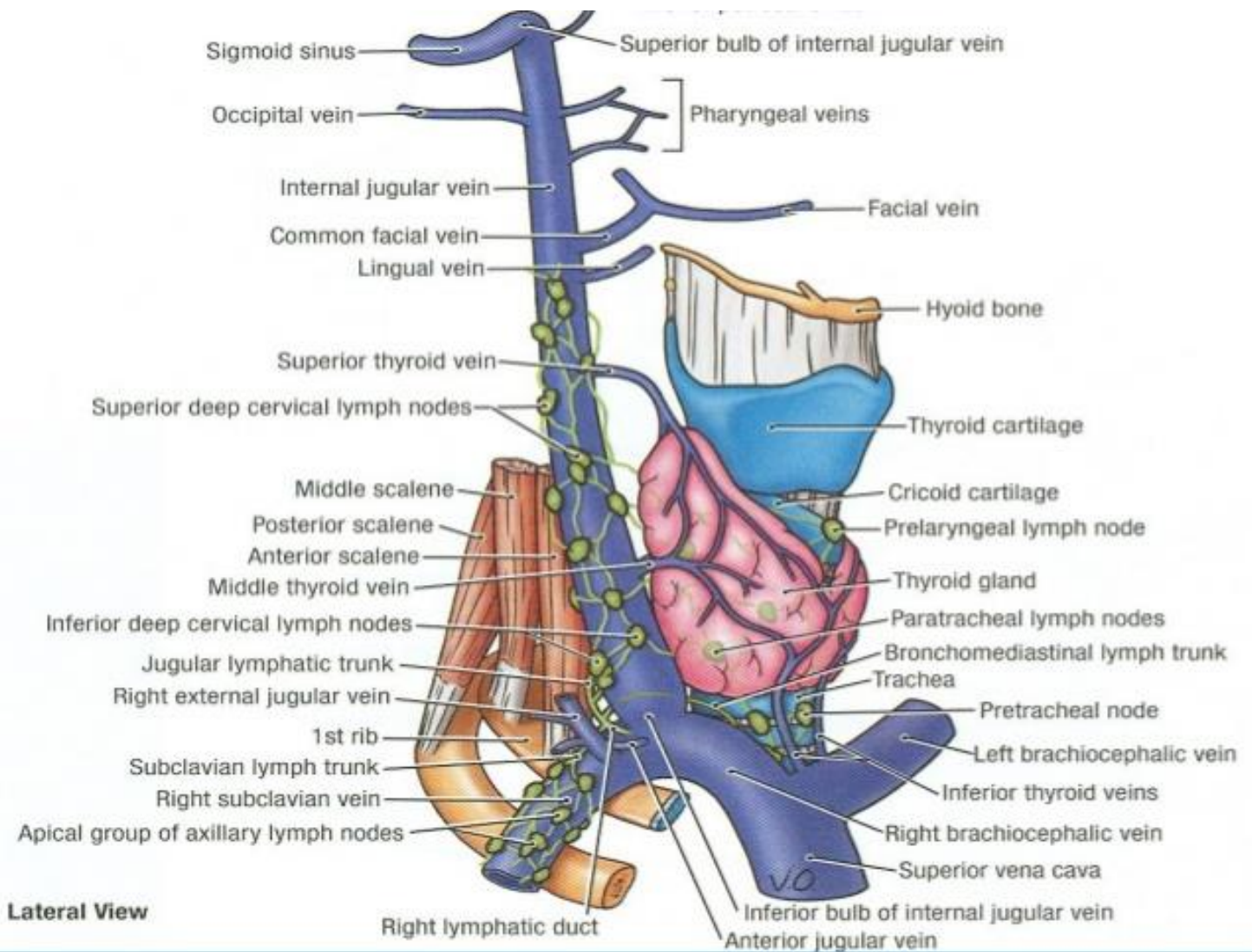
Arteries	Veins
<p>1. Superior thyroid artery:</p> <ul style="list-style-type: none"> - From external carotid artery. - It is accompanied by the external laryngeal nerve which descends behind the artery (<i>during thyrodictomy superior thyroid artery should be ligated as near as possible to the apex of lat. lobe to avoid injury of this nerve</i>). - It supply the upper part & anterior surface of the gland . <p>2. Inferior thyroid artery:</p> <ul style="list-style-type: none"> - From thyrocervical trunk of 1st part of subclavian artery -It comes in direct relation with the recurrent laryngeal nerve (<i>superficial, deep or in between the branches of the artery → this artery should be ligated as far as possible from the gland to avoid injury of the recurrent laryngeal nerve</i>). - It supply the lower part & posterior surface of the gland . <p>3. Thyroidea ima artery: From arch of aorta to supply isthmus (it may be absent)</p>	<p>* Thyroid venous plexus on the thyroid capsule drain into :</p> <p>1. Superior thyroid vein: From the apex of the gland to end in internal jugular vein .</p> <p>2 .Middle thyroid vein: It is a very short vein which arises from each lobe to end in internal jugular vein.</p> <p>3. Inferior thyroid vein: From the isthmus, descends to end in brachiocephalic vein</p>

* Nerve supply : branches of the **cervical sympathetic ganglia** reaches the gland along the **periarterial plexuses** that accompany the **thyroid arteries** . These nerves are **vasomotor, not secretomotor** – endocrine secretion of thyroid hormone is controlled by pituitary gland .



□ To avoid injury to the external laryngeal nerve, the superior thyroid artery is ligated and sectioned near the superior pole of the thyroid gland where it is **not** so closely related to the nerve as it is at its origin.





* **Lymphatic Drainage:** There is an extensive lymphatic plexus within the gland which is drained *into the following nodes*:

- 1) **Prelaryngeal nodes:** In front of the cricothyroid membrane, draining the upper part of the isthmus.
- 2) **Pretracheal nodes:** In front of the trachea, draining the lower part of the isthmus.
- 3) **Paratracheal nodes:** On the sides of the trachea, draining the post. surface of the gland.
- 4) **Upper & Lower deep cervical nodes:** Along the internal jugular vein, forming the main lymphatic drainage of the gland.
- 5) **Brachiocephalic nodes:** In the superior mediastinum, draining the lower part of the gland .

* **Applied anatomy :**

- 1) Thyroid gland **moves up and down with deglutition** because it is enclosed in pretracheal fascia and presence of ligament of Berry.

- 2) **Pretracheal fascia is attached to:**
 - ◆ *Upwards* to oblique line of thyroid cartilage and hyoid bone which move with deglutition.
 - ◆ *Inferiorly* it fuses with the adventitia of arch of aorta and fibrous pericardium.
 - ◆ *Lateral*: forms the carotid sheathes.
- 3) **Ligament of Berry** is a thickening of posterior part of pretracheal fascia that fixes the back of each lobe to the cricoid cartilage.
- 4) **Structures enclosed within pretracheal fascia:**
 - ◆ Thyroid gland
 - ◆ Parathyroid glands.
 - ◆ Pretracheal and prelaryngeal L.Ns.
 - ◆ Remnants of thyroglossal tract.
 - ◆ Remnant of thymus gland.
- 5) **Movement with deglutition is also exhibited** by any swelling related to floor of mouth, hyoid bone, larynx or trachea e.g., thyroglossal cyst, submental, prelaryngeal and pretracheal L.Ns enlargement, subhyoid and Adam's apple bursitis, parathyroid swelling, tracheocele and laryngocele.
- 6) Thyroid swelling always moves with deglutition unless **fixed by:**
 - ◆ Malignancy.
 - ◆ Riedel's thyroiditis.
 - ◆ Huge goitre.
 - ◆ Scarring of the previous operation.
 - ◆ Retrosternal goitre.
- 7) Thyroglossal cyst & fistula and subhyoid bursitis moves ***with deglutition and protrusion of tongue.***
- 8) Enlargement of thyroid gland is called **goitre** which is single swelling, in the lower part of the front of the neck, moves with deglutition, deep to sternomastoid and may be butterfly in shape (if diffuse enlargement).
- 9) Goitre is the 2nd common neck swelling (the 1st is L.Ns enlargement).
- 10) During thyroidectomy **pretracheal muscles are retracted or divided** (in case of huge goiter, thyrotoxicosis or carcinoma), transversely near their upper attachment (to preserve their nerve supply from ansa cervicalis which comes from below)

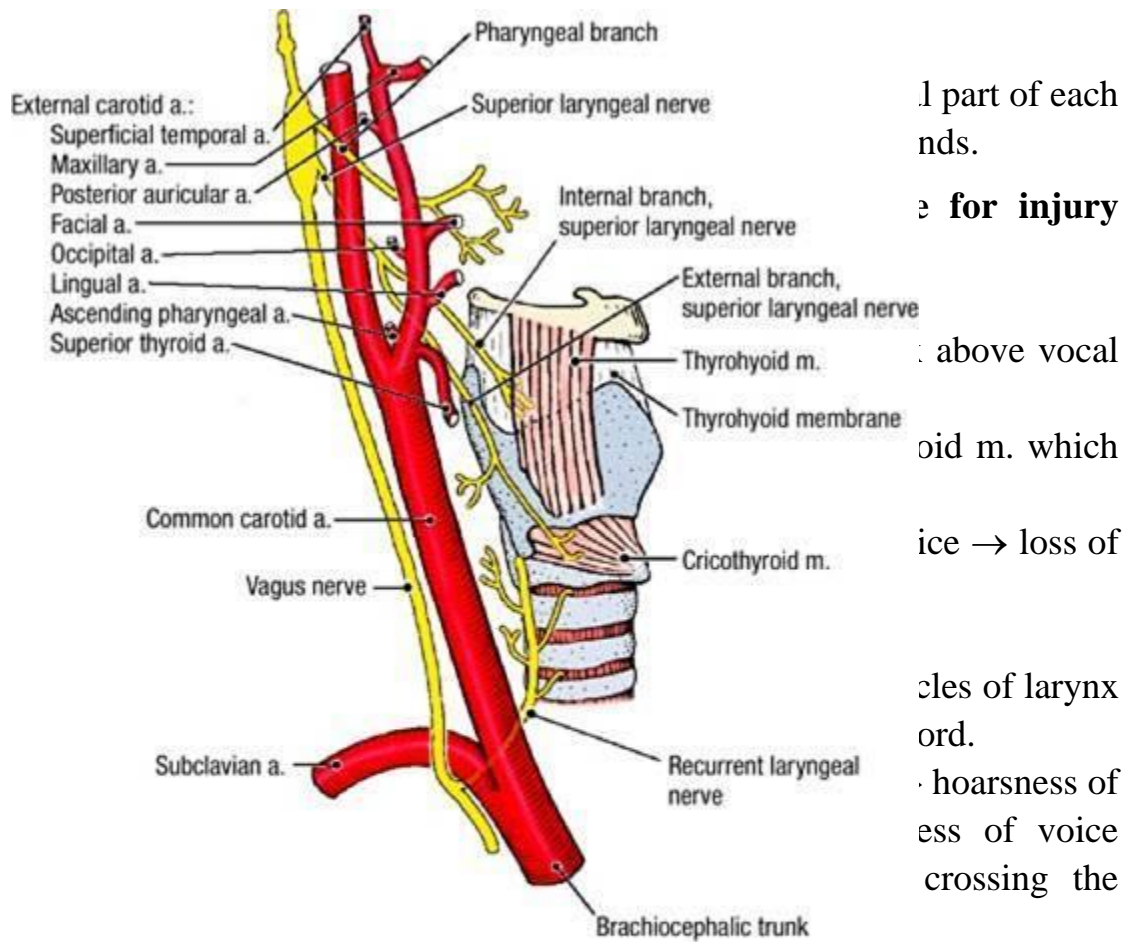
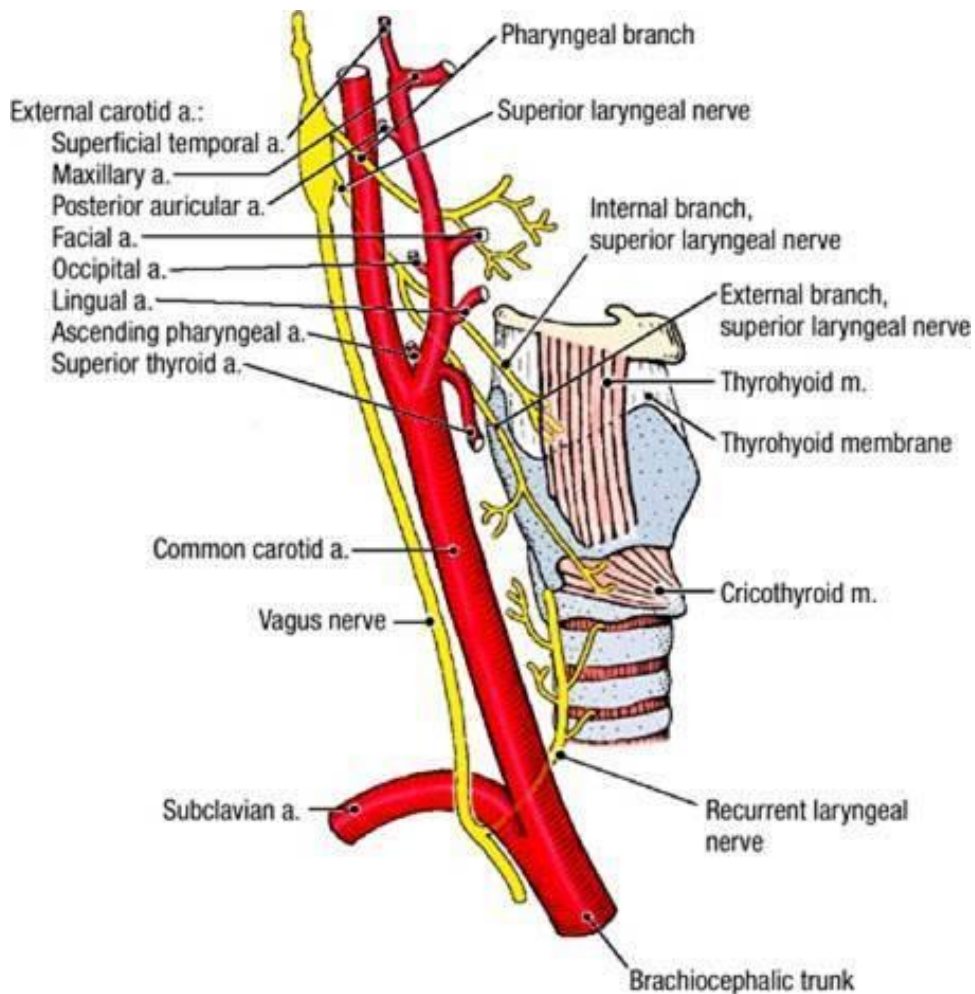


Figure 7.9. Branches of the external carotid artery and right vagus nerve (X) in the neck.



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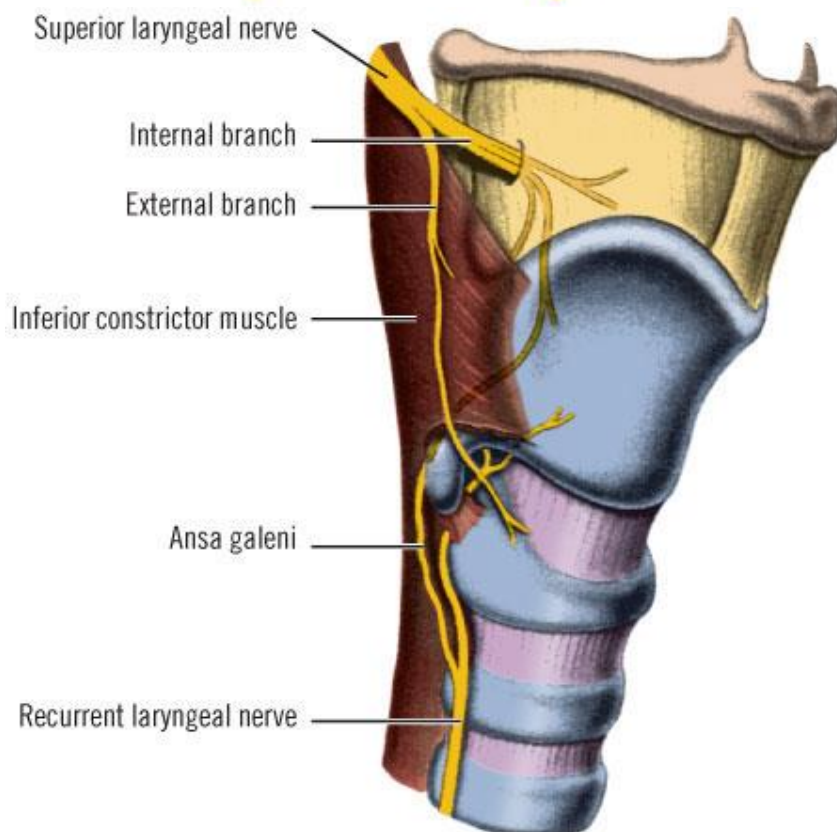
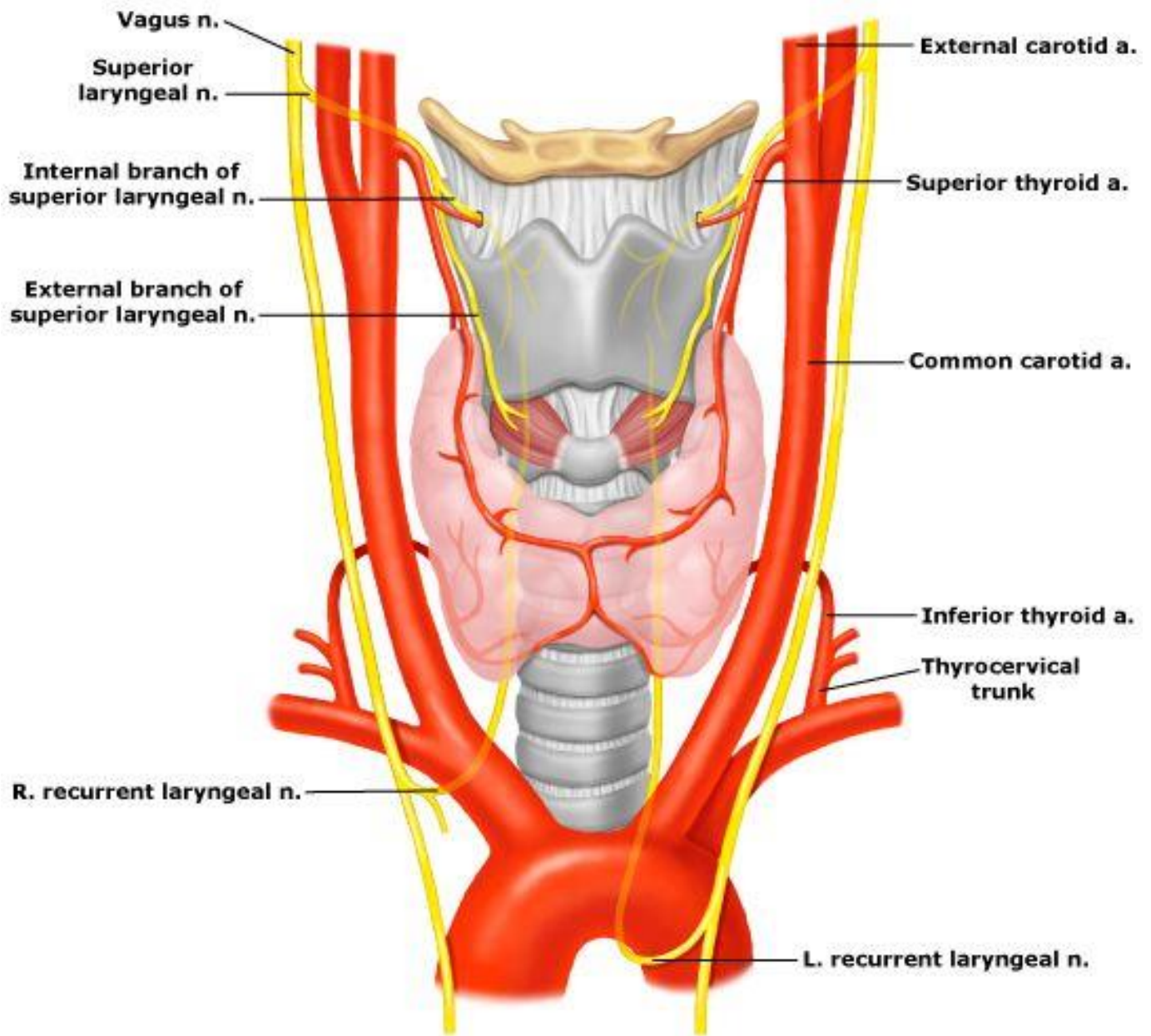
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- 13) When incising the trachea inferior to the isthmus of thyroid gland (**during tracheostomy**), thyroidal artery and inferior thyroid veins are liable for injury.
- 14) The capsule of thyroid gland is surrounded by nerve plexus derived from the laryngeal branches of vagus. Infiltration of this plexus by extra-thyroidal tumour → referred pain along the auricular branch of vagus (Arnold's nerve) → **pain in the auricle is one of early manifestations of extra-thyroidal spread of malignancy.**
- 15) Goitre with **hoarsness of voice** (R.L.N injury) is one of early manifestations of local infiltration by thyroid cancer.
- 16) In benign goiters , **the common carotid artery (CCA)** is shifted backwards and have equal volume but malignancy surrounds and compress the artery (never infiltrate it) → CCA in place but of weak or absent volume (Berry's sign).
- 17) The thyroid gland is **closely related to the trachea** → benign goitre compress or displace the trachea but malignant goitre infiltrate and become fixed to the trachea.
- 18) **Retrosternal goitre compress brachiocephalic veins and SVC** → congested oedematous face with dilated veins crossing the manubrium sterni due to opening of anastomosis between cervical and thoracic veins.

