THYROID&PARATHYROID GLANDS

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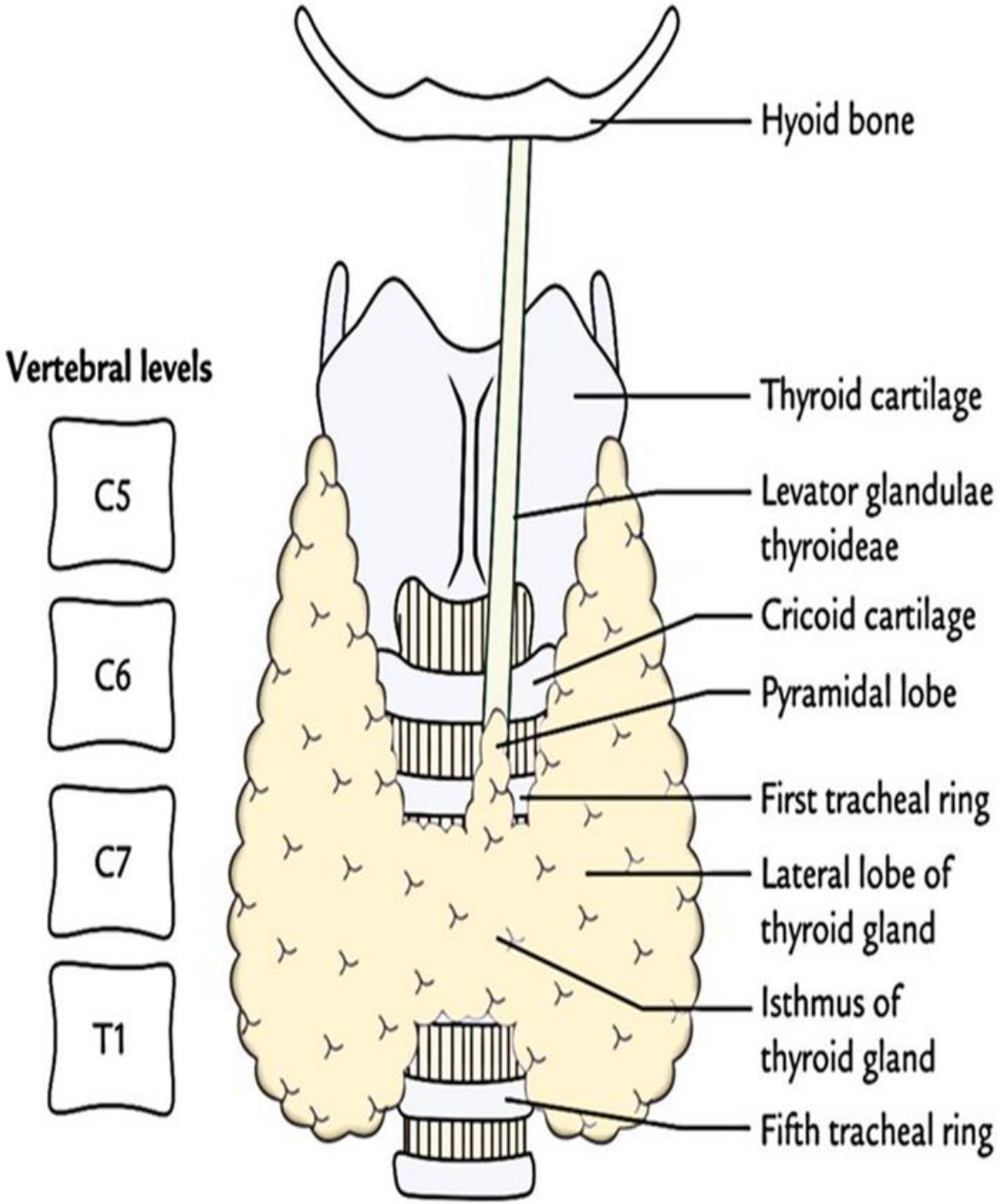
★ **Thyroid Gland**

★ **Site & Shape:**

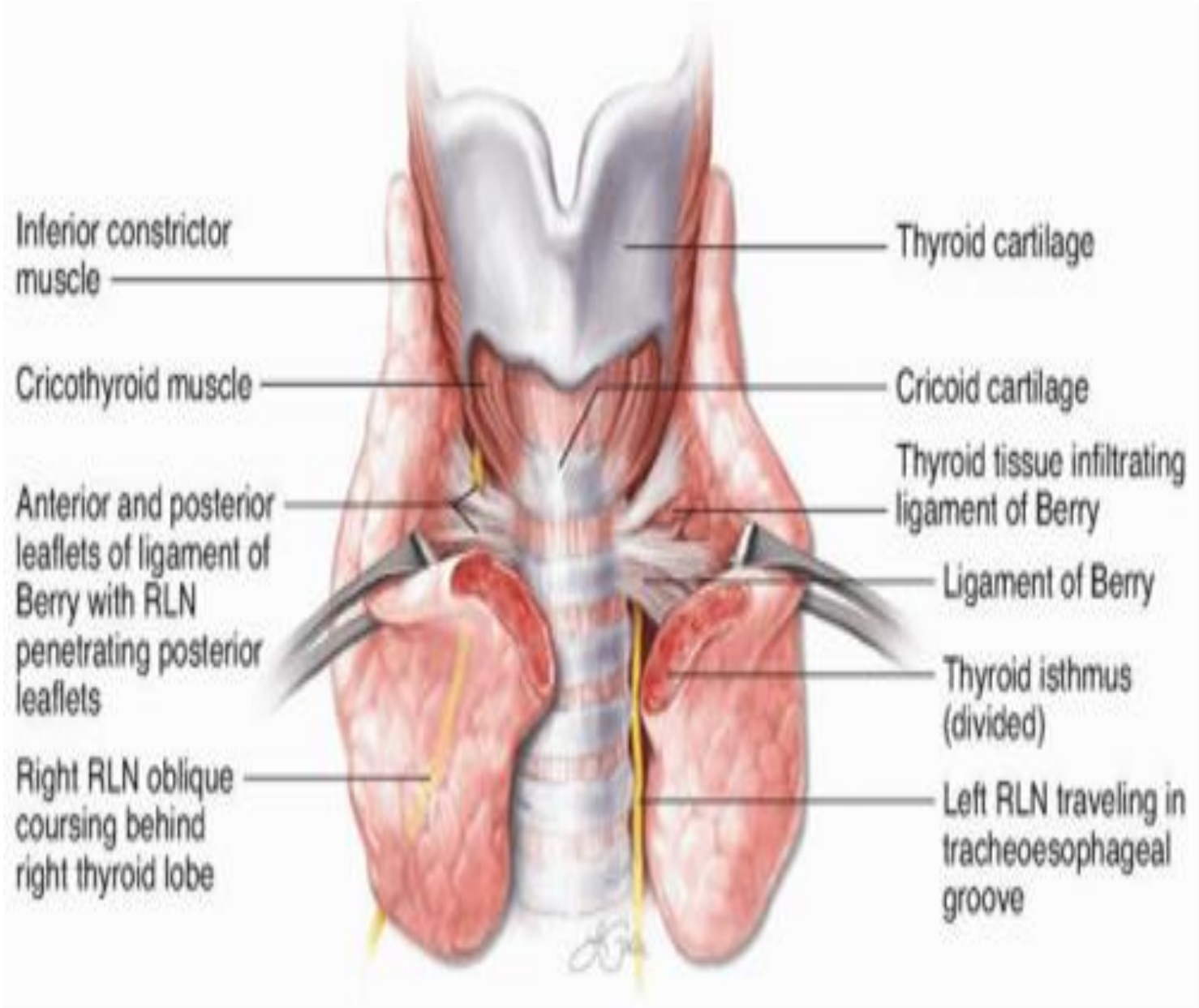
- **It is an endocrinal gland, about 20-25 gm in adults, lies in the lower part of front of the neck.**
- **It is butterfly in shape & formed of 2 lateral lobes connected by an isthmus.**
- **Each lobe is pyramidal in shape, its apex reaches the oblique line of thyroid cartilage, its base reaches the level of 5th- 6th tracheal ring.**
- **The isthmus lies opposite 2, 3, 4 tracheal rings.**

•Small pyramidal lobe: (may be present) project upwards from the isthmus and may be connected by fibromuscular band called levator glandulae thyroidea(remnants of thyroglossal duct of the embryo)

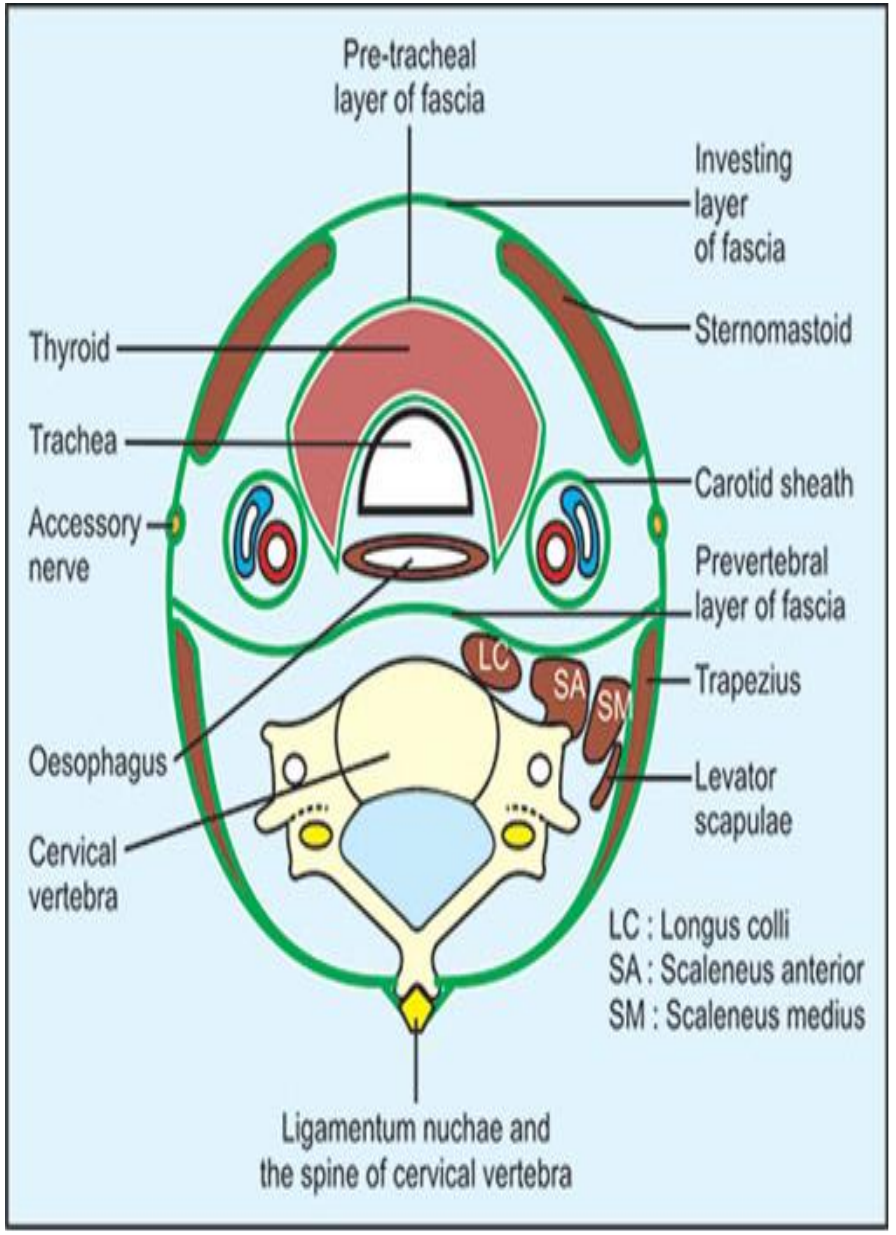


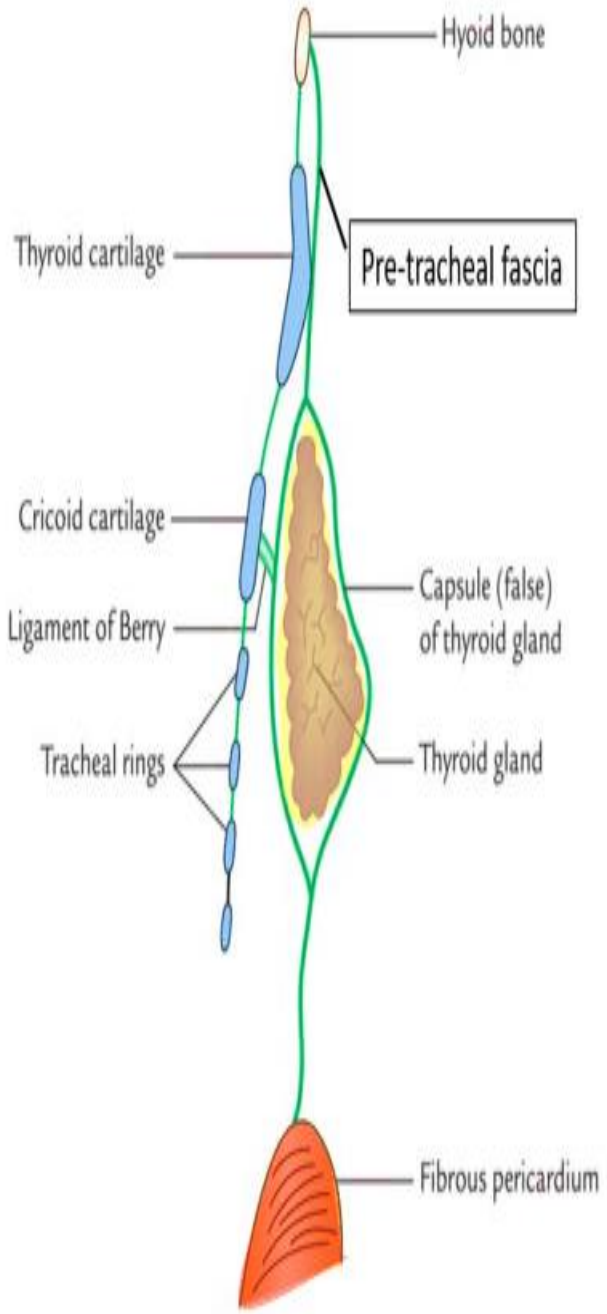
Capsule:

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



- **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 & upper tracheal rings.**

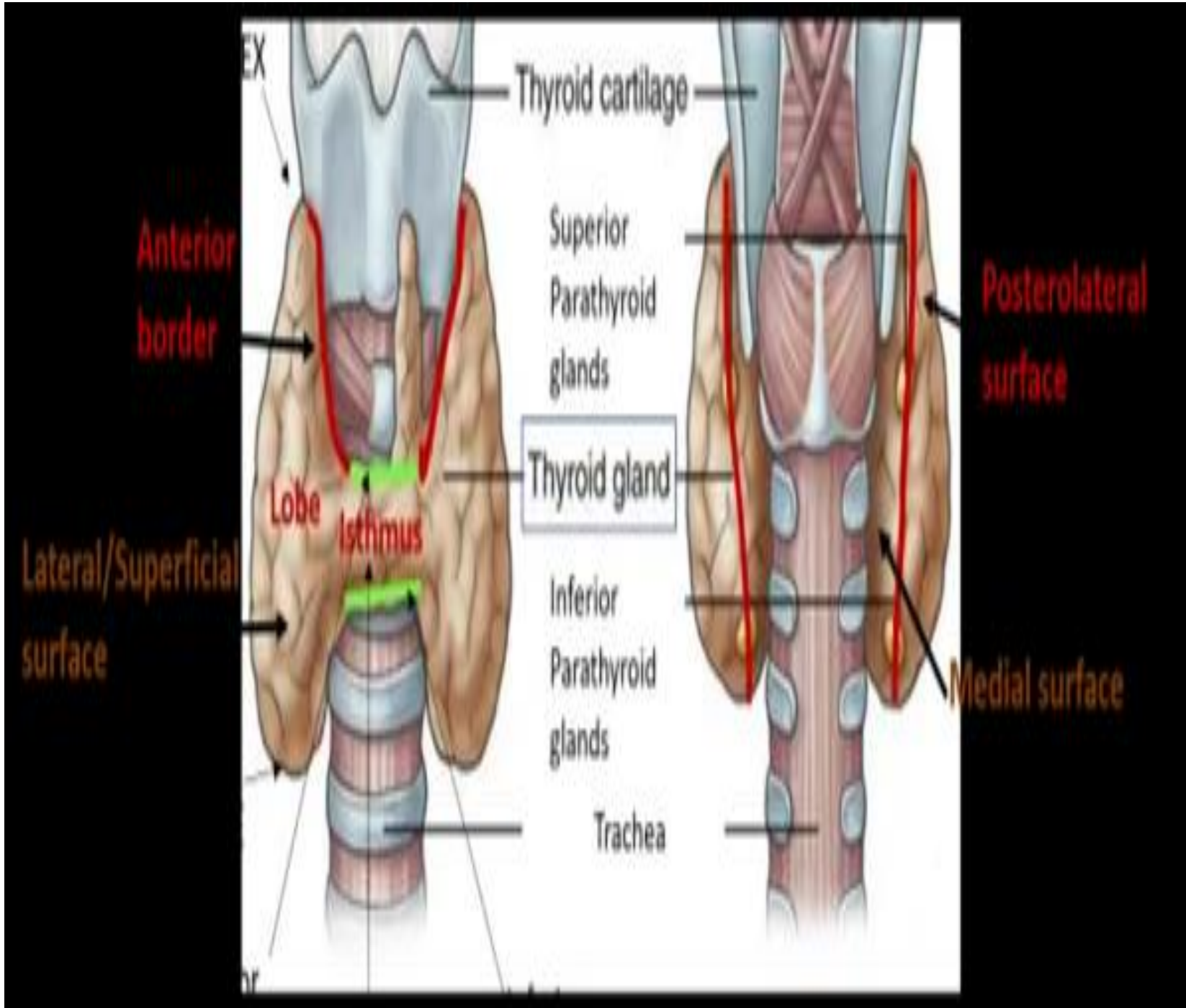




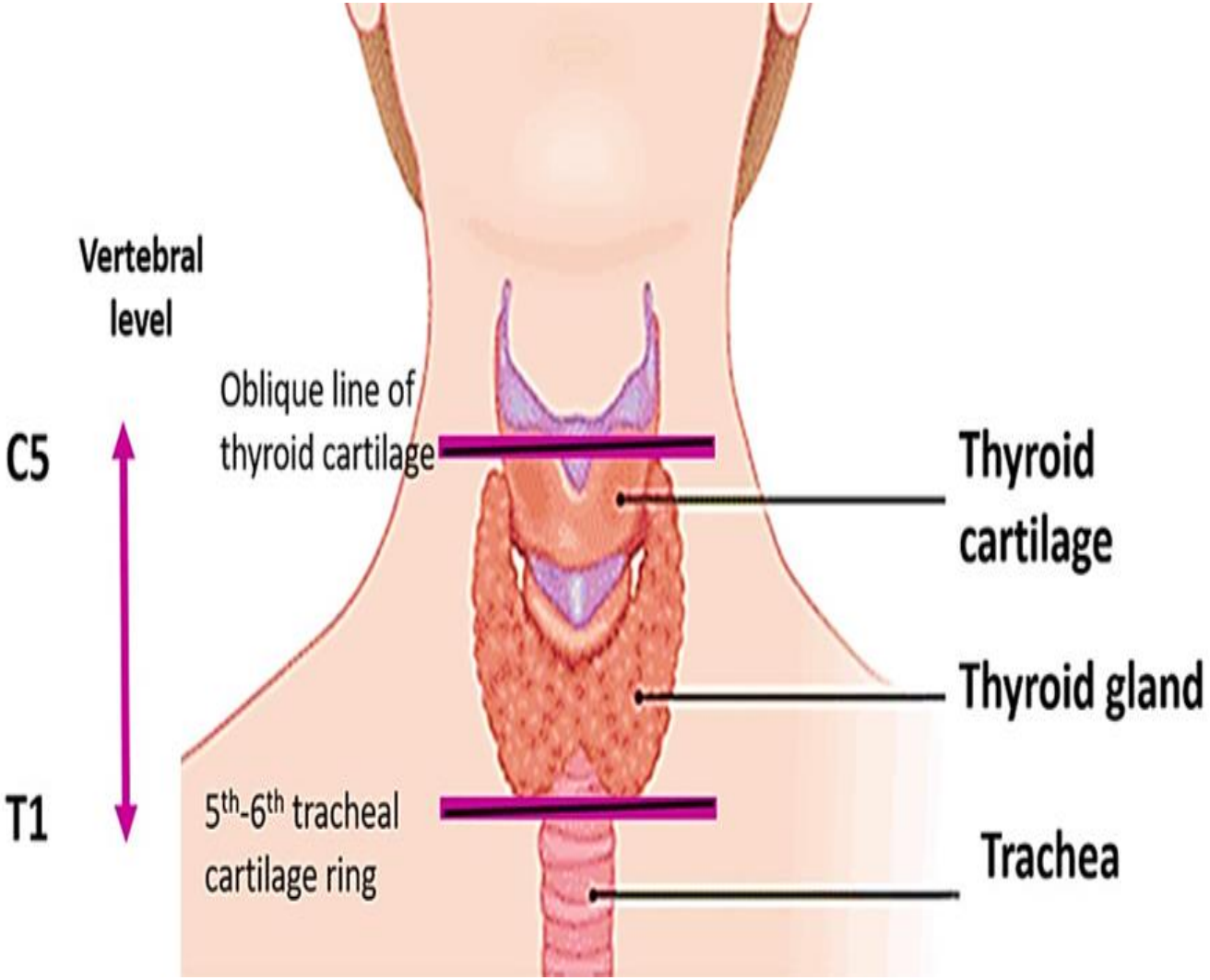
Every lobe of the thyroid gland is pyramidal (conical) in shape, each has:

- ✓ **apex,**
- ✓ **base,**
- ✓ **3 surfaces (lateral, medial and posterolateral)**

- ✓ **and 2 borders (anterior and posterior)**



Apex: The apex is pointed upwards and laterally.
It reaches up to the oblique line of thyroid cartilage.
The apex is sandwiched between the inferior constrictor medially and sternothyroid laterally.



Base:

The base reaches down to the 5th or 6th tracheal ring.

Lateral (superficial) surfaces:

It's convex and is covered by:

3 strap muscles (sternothyroid, sternohyoid and superior belly of omohyoid) AND anterior border of sternocleidomastoid overlapping it inferiorly

Medial surface Its upper part is related to

a) Larynx: thyroid, cricoid cartilages & cricothyroid muscle

b) Pharynx: inferior constrictor muscle

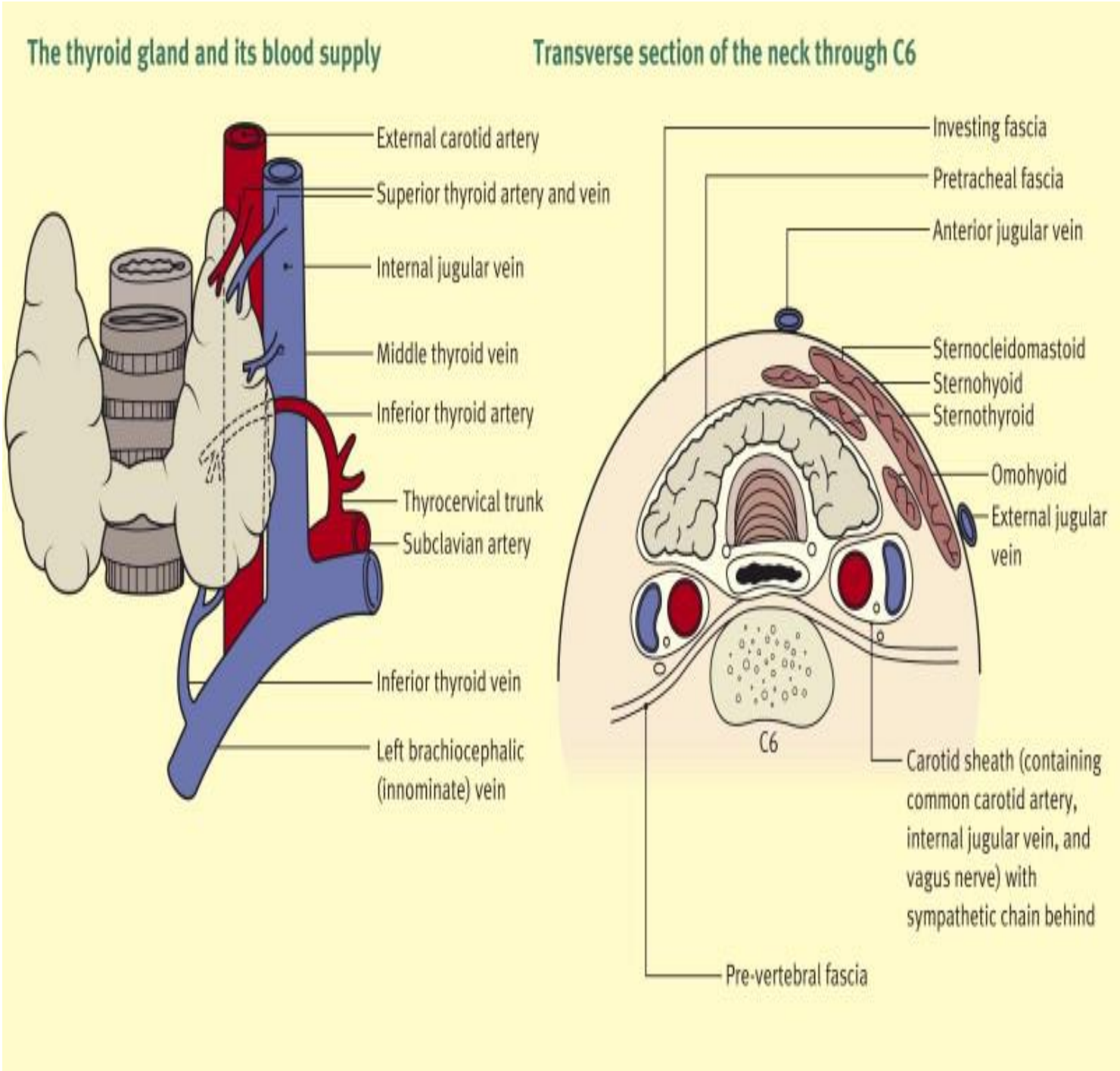
c) External laryngeal nerve

Its lower part is related to

a) Trachea

b) cervical Oesophagus

c) recurrent laryngeal nerve (in between)

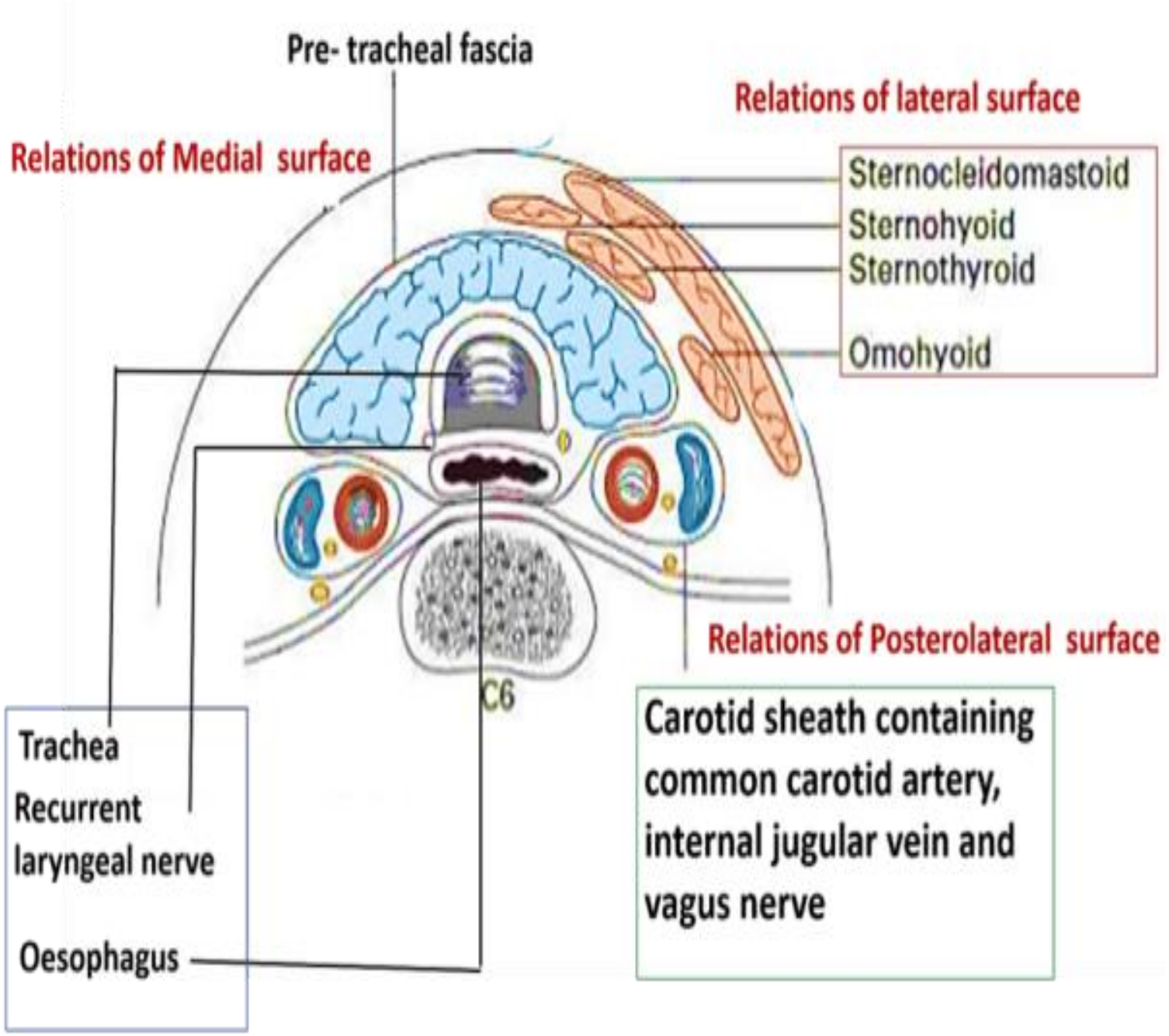


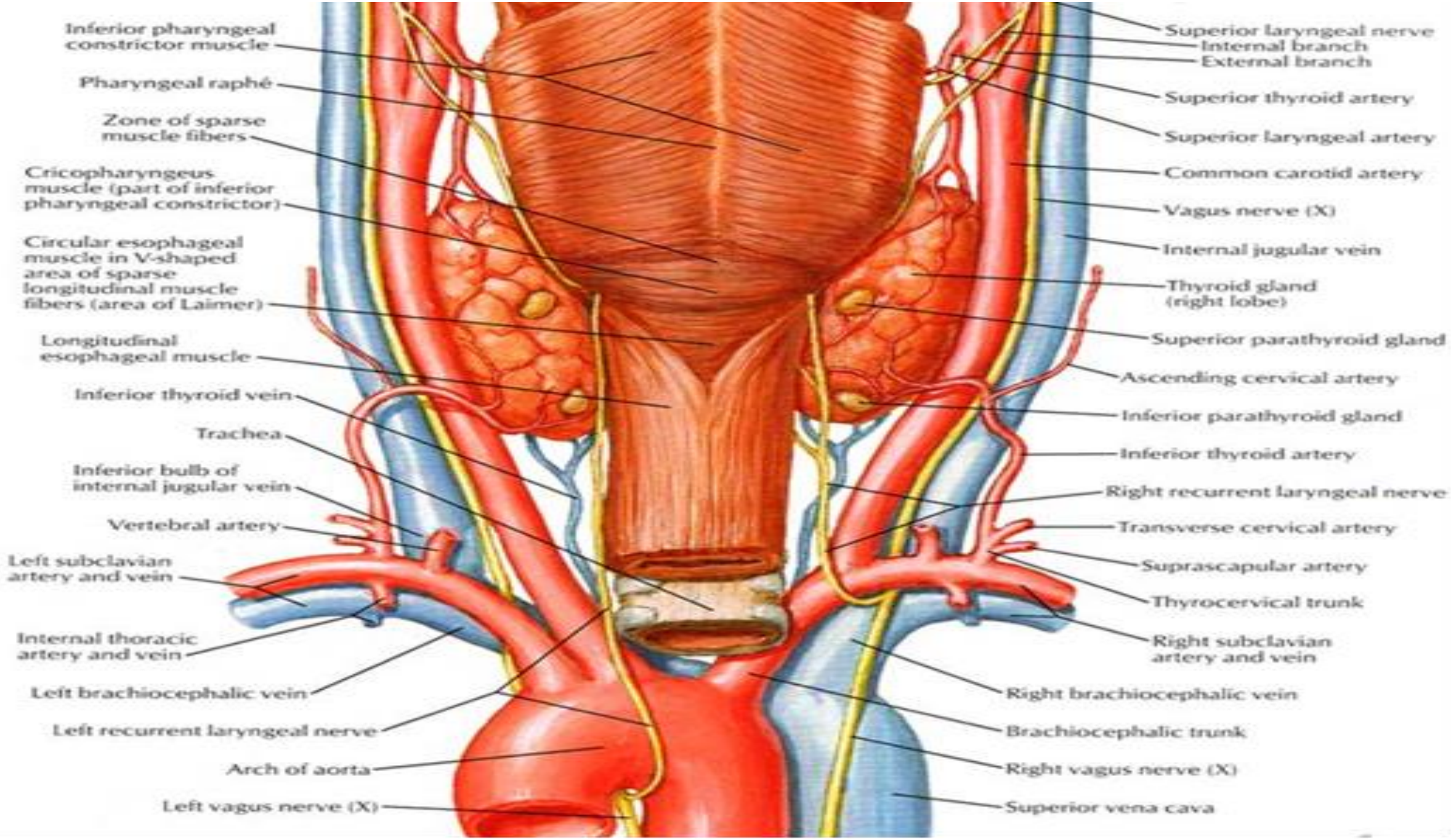
Posterolateral surface is related to

-**carotid sheath** and its contents (common carotid artery, internal jugular vein and vagus nerve).

-The Ansa-cervicalis is embedded in the anterior wall of the sheath

-**inferior thyroid artery** & **parathyroid glands** embedded in the posterior surface of the gland.




Inferior pharyngeal constrictor muscle
Pharyngeal raphé
Zone of sparse muscle fibers
Cricopharyngeus muscle (part of inferior pharyngeal constrictor)
Circular esophageal muscle in V-shaped area of sparse longitudinal muscle fibers (area of Laimer)
Longitudinal esophageal muscle
Inferior thyroid vein
Trachea
Inferior bulb of internal jugular vein
Vertebral artery
Left subclavian artery and vein
Internal thoracic artery and vein
Left brachiocephalic vein
Left recurrent laryngeal nerve
Arch of aorta
Left vagus nerve (X)
Superior laryngeal nerve
Internal branch
External branch
Superior thyroid artery
Superior laryngeal artery
Common carotid artery
Vagus nerve (X)
Internal jugular vein
Thyroid gland (right lobe)
Superior parathyroid gland
Ascending cervical artery
Inferior parathyroid gland
Inferior thyroid artery
Right recurrent laryngeal nerve
Transverse cervical artery
Suprascapular artery
Thyrocervical trunk
Right subclavian artery and vein
Right brachiocephalic vein
Brachiocephalic trunk
Right vagus nerve (X)
Superior vena cava

Anterior border

is thin

It splits lateral and medial surfaces.

It's related to anterior branch of the superior thyroid artery.

Posterior border

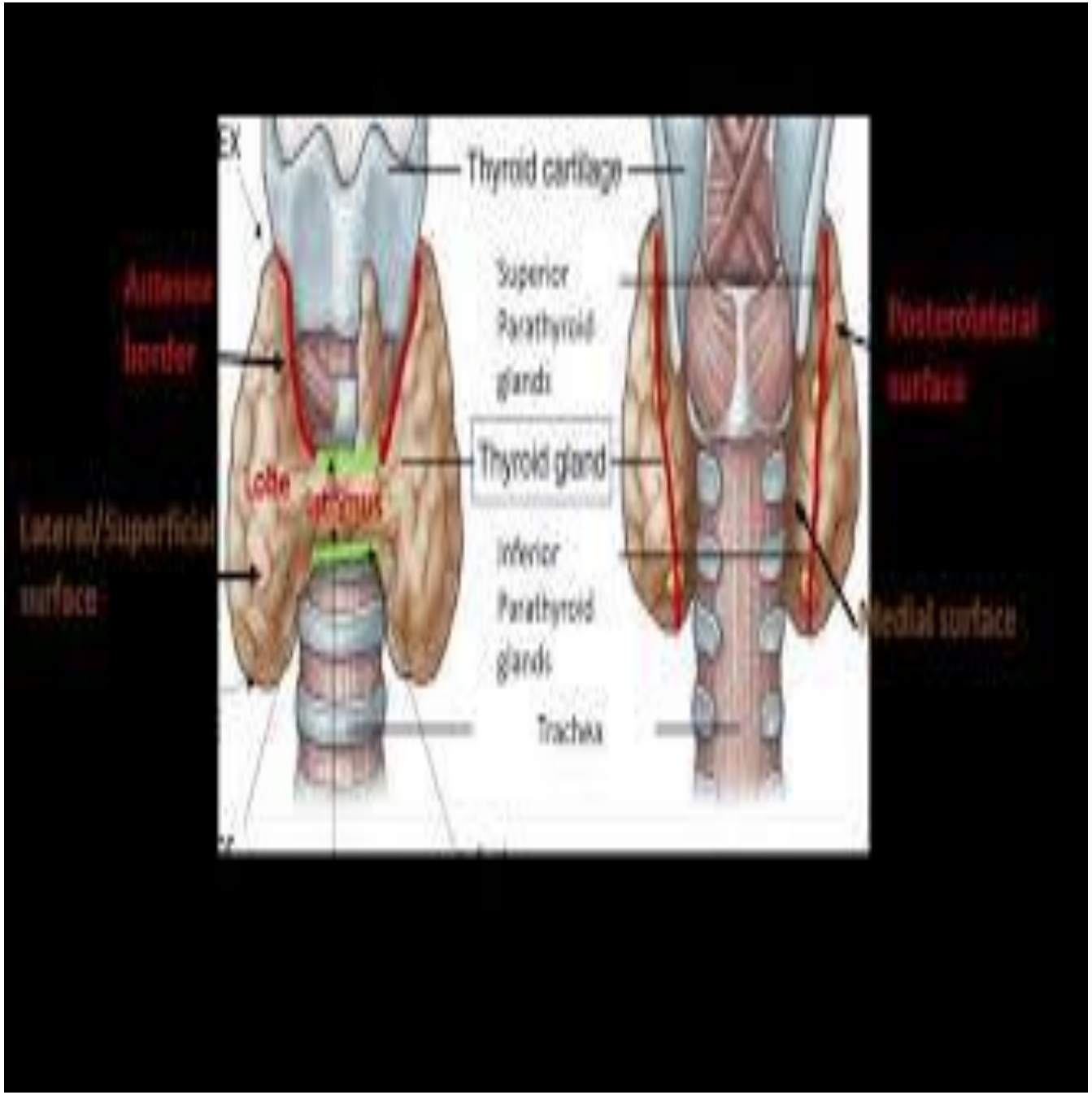
is thick and rounded.

It splits the medial and the posterior surfaces.

It's related to:

1-longitudinal arterial anastomosis between superior and inferior thyroid arteries

2-parathyroid glands



The **ISTHMUS** is:

horizontal

It has 2 surfaces- anterior and posterior

It has 2 edges- superior and inferior.

Anterior surface is related to:

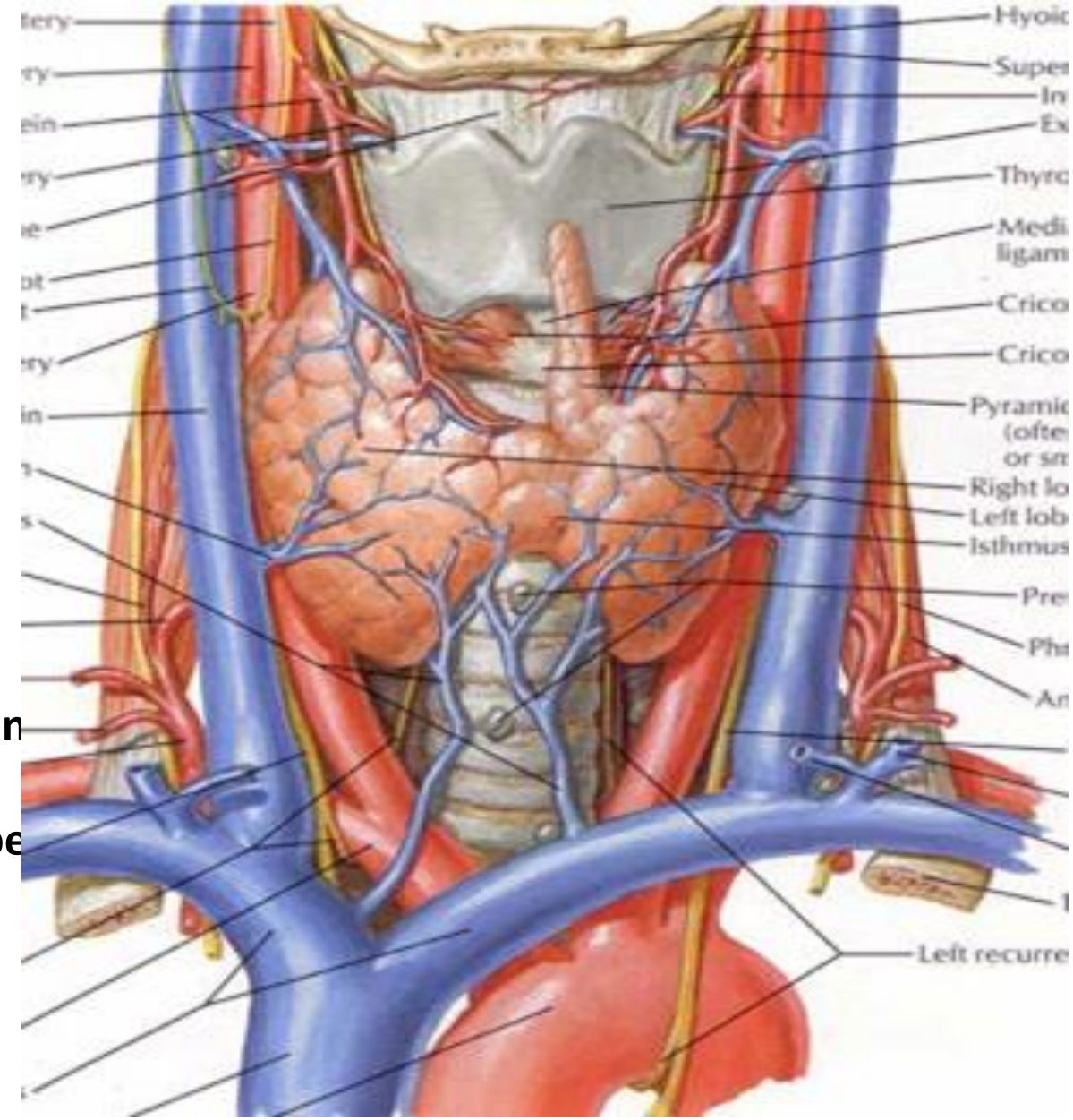
strap muscles (sternohyoid and sternothyroid
anterior jugular veins

Posterior surface is related to:

second, third and 4th tracheal rings.

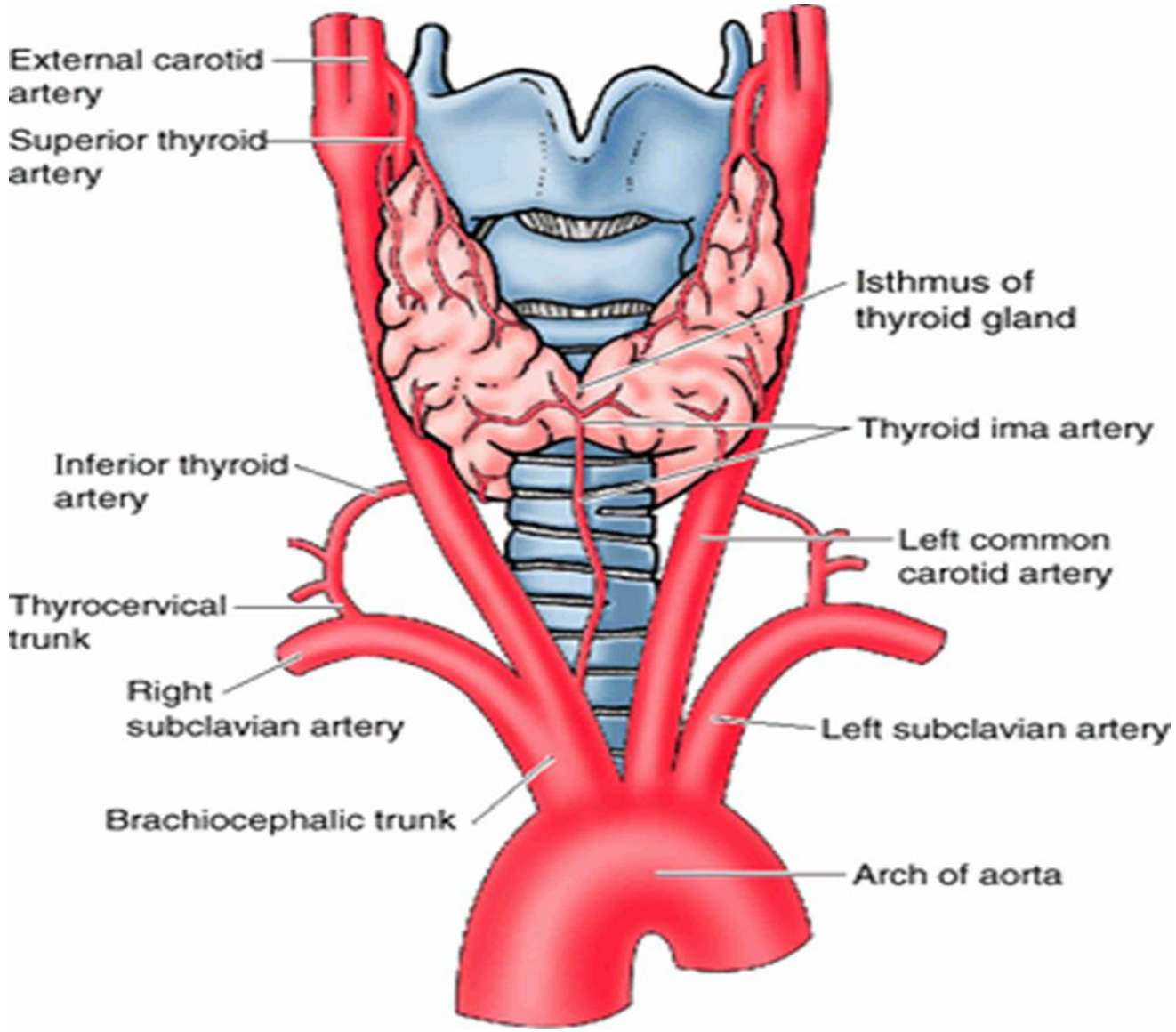
Superior border is associated with anastomosis between the anterior branches of the right and left superior thyroid arteries. Also it is attached to the pyramidal lobe if present

Inferior border: Along this border inferior thyroid vein exit and thyroida ima artery (when present) enters.



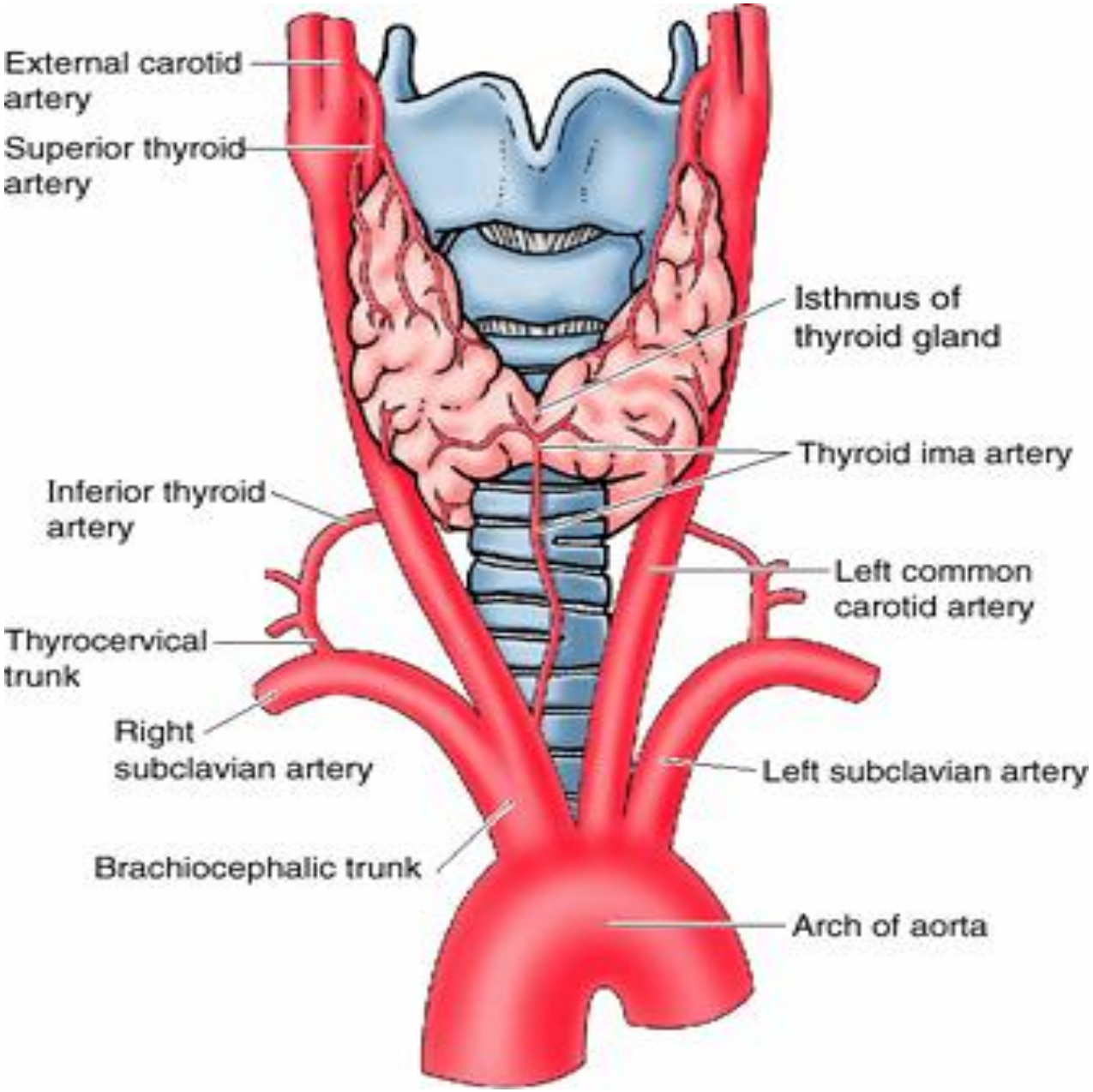
Arteries of Thyroid Gland

- The highly vascular thyroid gland is supplied by the superior and inferior thyroid arteries.
- 1- the superior thyroid arteries
- Usually, the first branches of the external carotid arteries, descend to the superior poles of the gland
- It divides into anterior and posterior branches supplying mainly superior part of the gland



2- The inferior thyroid arteries:

- the largest branches of the THYROCERVICAL TRUNKS arising from the SUBCLAVIAN arteries
- They divide into <u>SEVERAL BRANCHES</u> that pierce the pretracheal fascia
- They supply the posteroinferior aspect,including the inferior poles of the gland.
- The right and left superior and inferior thyroid arteries <u>anastomose</u> extensively WITHIN the gland, ensuring its supply while providing potential collateral circulation between the subclavian and external carotid arteries.



3- thyroid ima artery

In approximately 10% of people, a small, unpaired artery arises from :
the BRACHIOCEPHALIC TRUNK (mainly)
however, it may arise from the ARCH OF THE AORTA
When present, this small artery ascends on the anterior surface of the trachea, supplying small branches to it. The artery then continues to the isthmus of the thyroid gland, where it divides and supplies it.

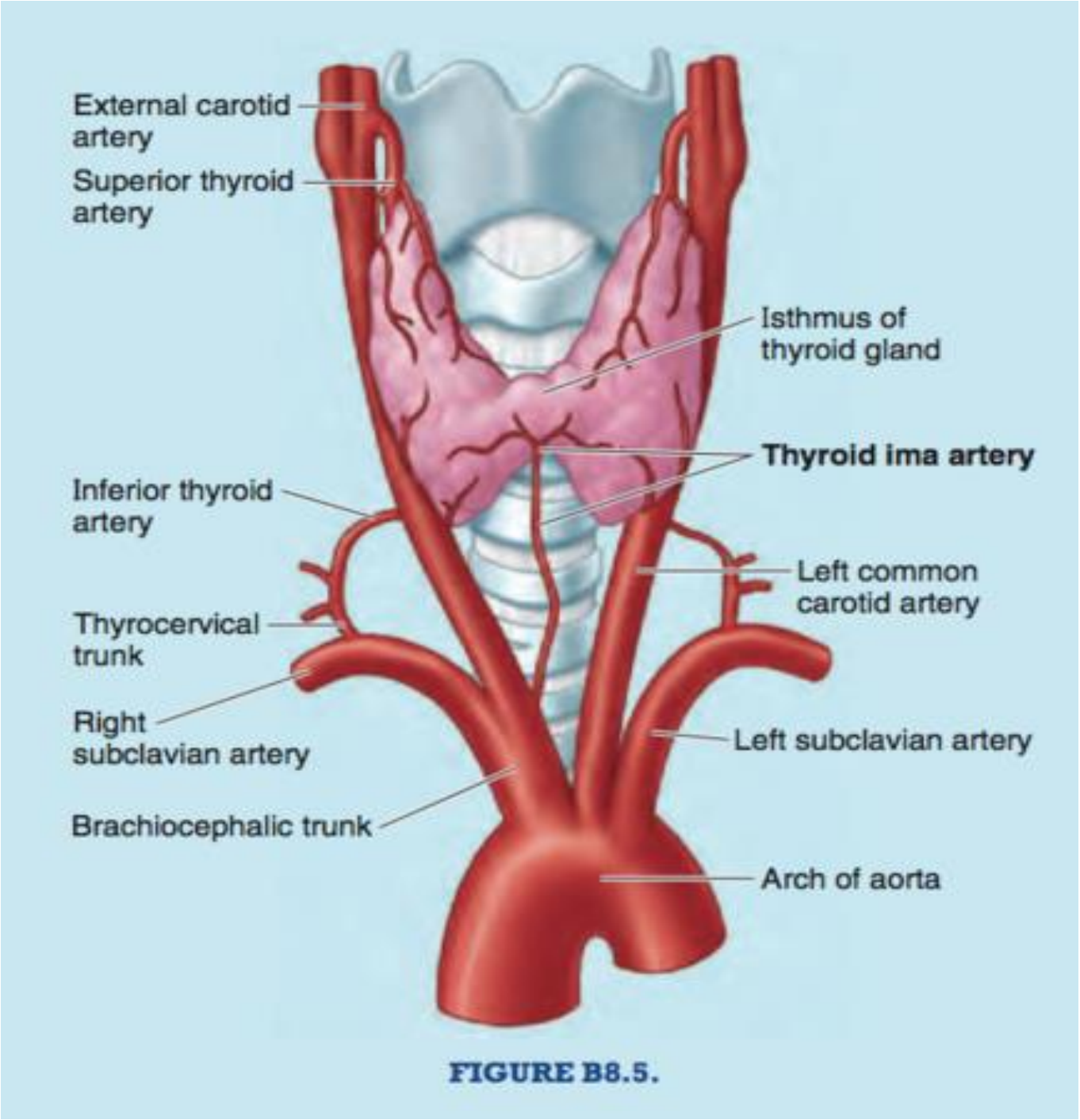


FIGURE B8.5.

Veins of Thyroid Gland.

Three of thyroid veins usually form a thyroid plexus of veins on the anterior surface of the thyroid gland and anterior to the trachea.

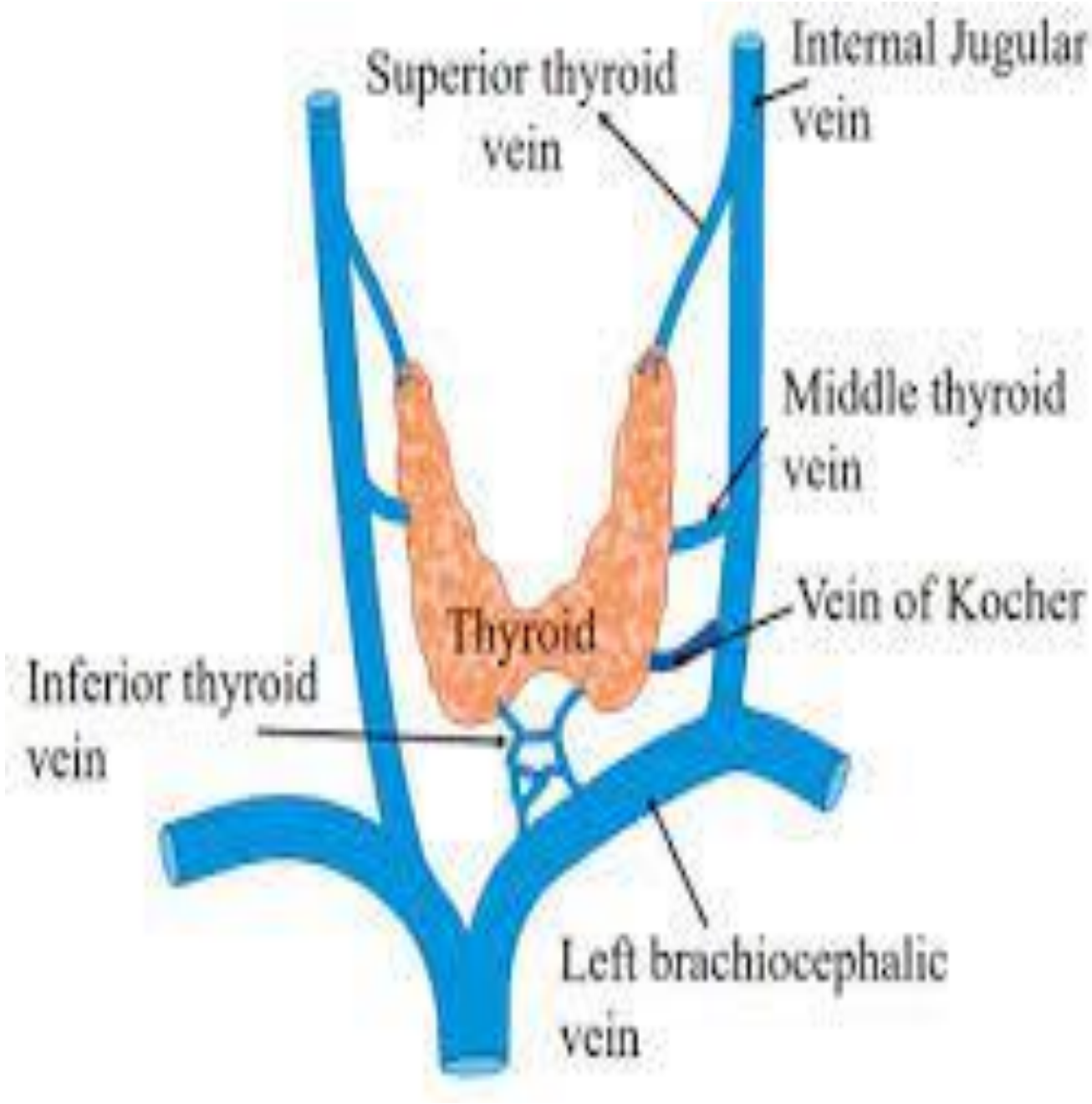
1- **The superior thyroid veins** accompany the superior thyroid arteries; they drain the superior poles of the thyroid gland

2- **the middle thyroid veins** **It is a very short vein** drain the middle of the lobes.

The superior and middle thyroid veins drain into **the Internal Jugular Vein**

3- **The inferior thyroid veins** drain the inferior poles.

They drain into **the brachiocephalic veins.**



Lymphatic Drainage of Thyroid Gland.

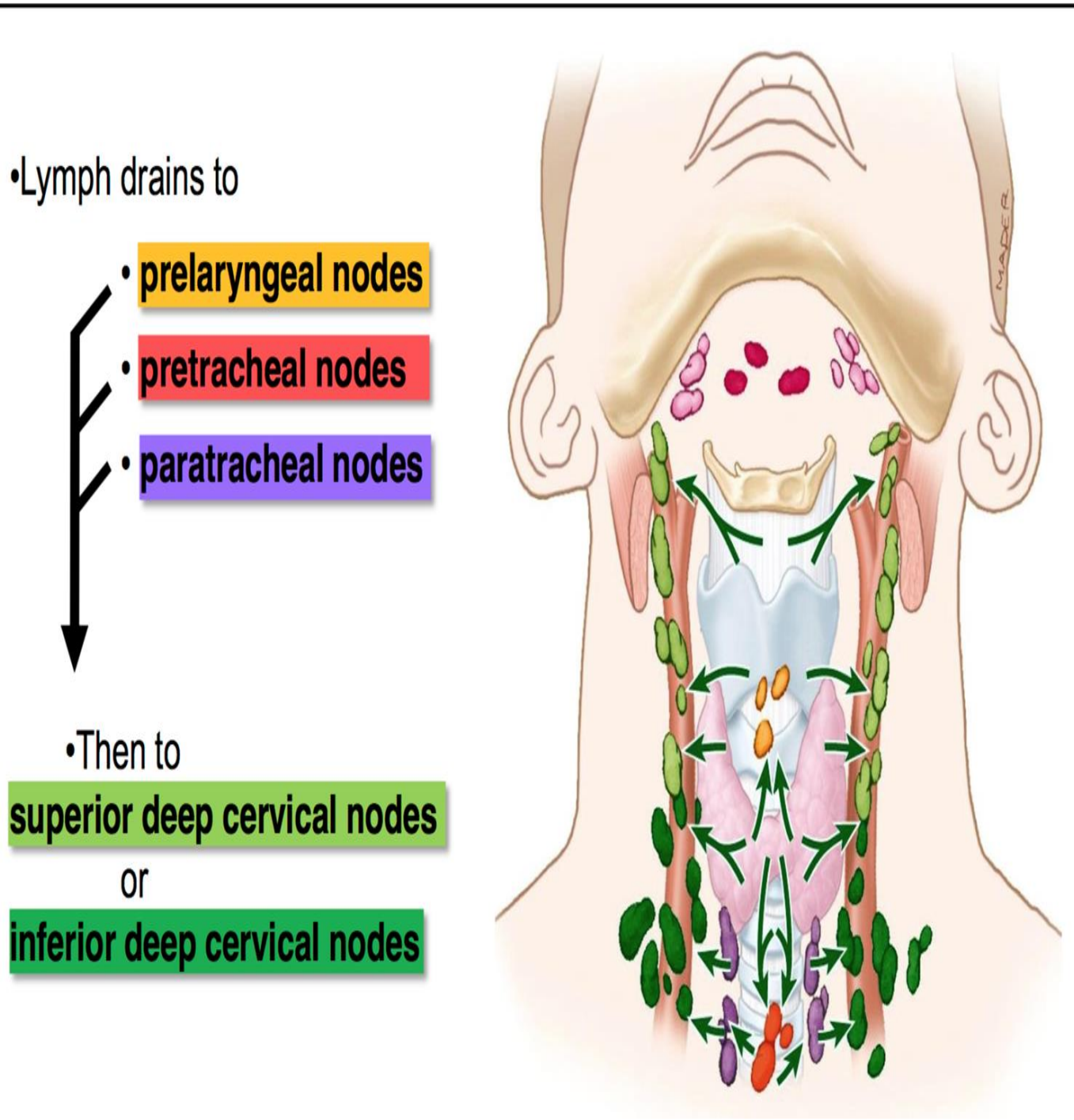
initially to prelaryngeal, pretracheal, and paratracheal lymph nodes.

The prelaryngeal nodes drain in turn to the superior deep cervical lymph nodes

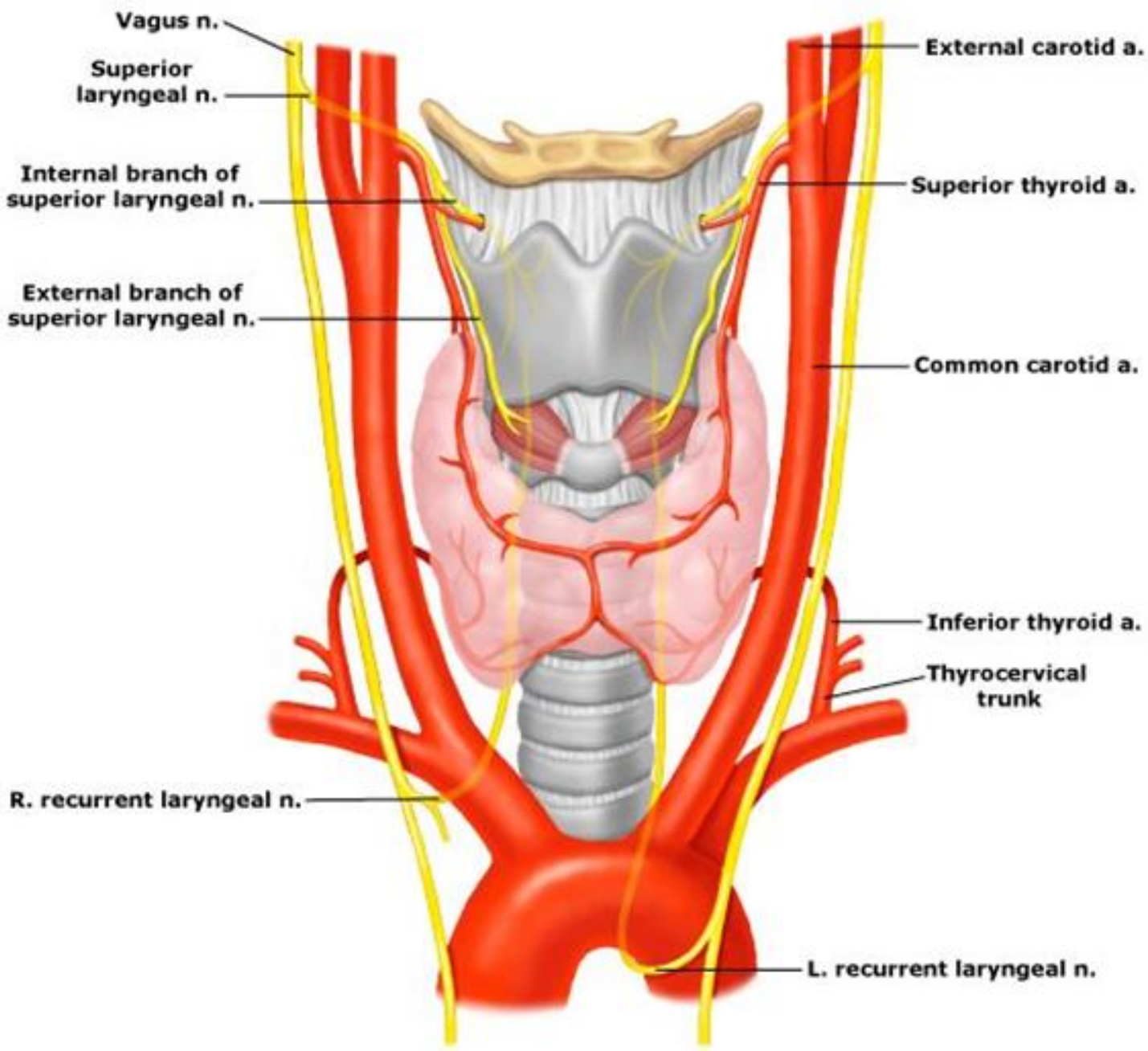
the pretracheal and paratracheal lymph nodes drain to the inferior deep cervical nodes .

Laterally, lymphatic vessels located along the superior thyroid veins pass directly to the inferior deep cervical lymph nodes.

Some lymphatic vessels may drain into the brachiocephalic lymph nodes or to the thoracic duct.



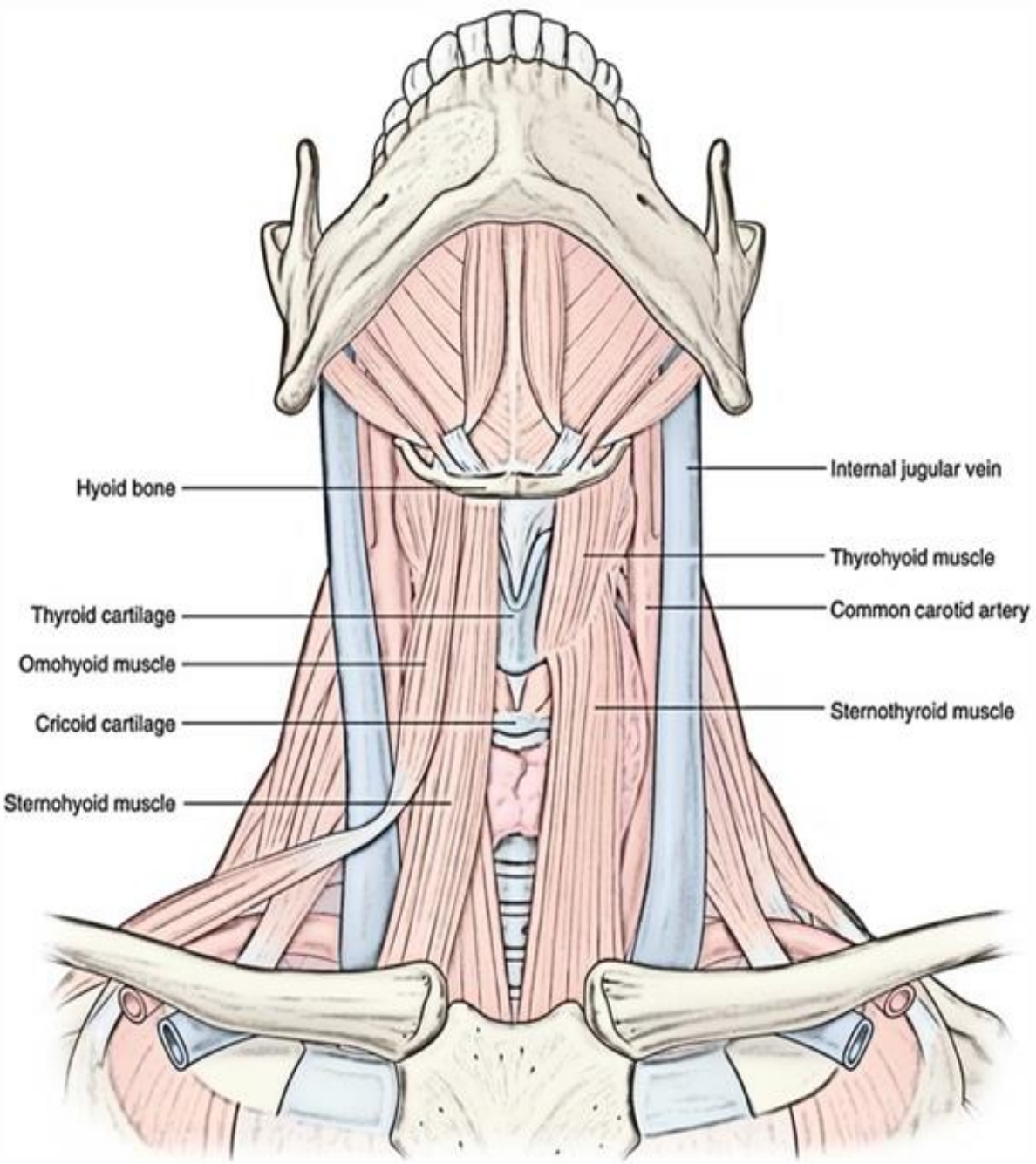
- **Applied Anatomy:**
- 1) Superior to the upper pole of the thyroid, the external laryngeal nerve runs with the superior thyroid artery before turning medially to supply the cricothyroid muscle.
- * High ligation of the superior thyroid artery during thyroidectomy may cause injury of the external laryngeal nerve.
- 2) Ligature of the inferior thyroid artery near the lower pole of the thyroid gland can lead to injury of the recurrent laryngeal



-During thyroidectomy pretracheal muscles are retracted or divided transversely near their upper attachment (to preserve their nerve supply from Ansa cervicalis which comes from below)

-In subtotal thyroidectomy, leave only the postero-medial part of each lobe to protect behind it the RLNs and parathyroid glands.

-Middle thyroid vein is thin short vein and should be ligated first to avoid its injury.



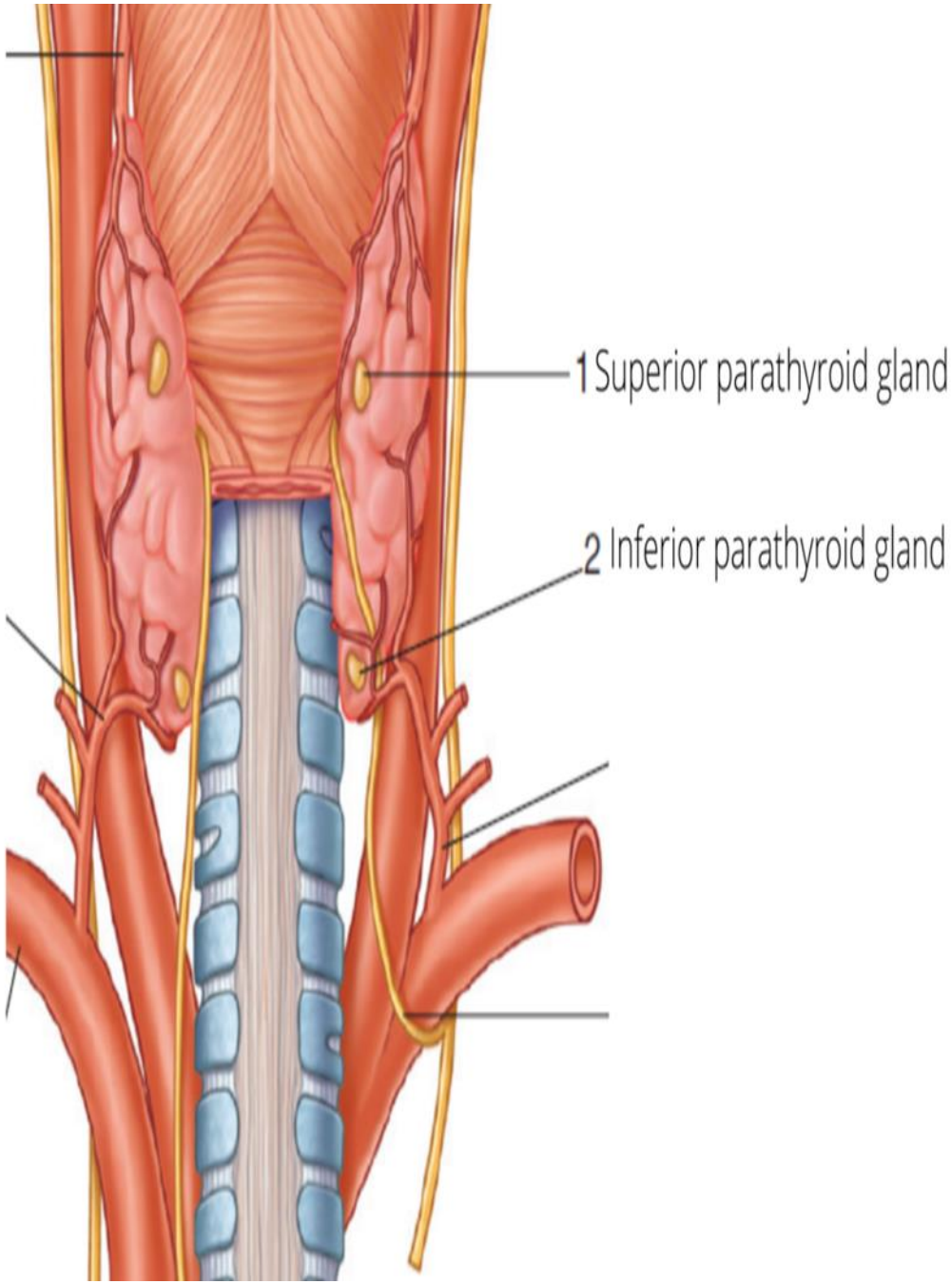
PARATHYROID GLANDS

The parathyroid glands are small (20-40 mg , 2x4x6 mm) , yellow , oval endocrine glands , responsible to produce parathormone hormone, which acts to control calcium levels i the body.

Position:

- **The parathyroid glands are located on the medial half of the posterior surface of the lateral lobes of the thyroid gland , usually situated external to the capsule of the gland but within its sheath.**
- **Superior & inferior parathyroid glands are usually located respectively approximately 1cm superior & inferior to the point of entry of the inferior thyroid arteries into the thyroid gland .**
- **Superior parathyroid glands are more constant in position , usually at the level of lower border of cricoid cartilage.**
- **Although inconsistent in location between individuals, the inferior parathyroid glands are usually found near the inferio poles of the thyroid gland.**

★ **Number:** **Most people have four parathyroid glands, although variation in number is common (2-8).**



★ **Relations:**

- **Anterior: Thyroid gland .**
- **Posterior: Common carotid artery .**
- **Arterial supply: inferior thyroid artery**
- **Lymphatic vessels from the parathyroid glands drain with those from the thyroid gland into deep cervical lymph nodes and paratracheal lymph nodes**

the parathyroid activity is controlled by the level of the blood calcium.

- **The hormone produced by the parathyroid glands, parathormone (PTH),**
- **controls the metabolism of phosphorus and calcium in the blood.**