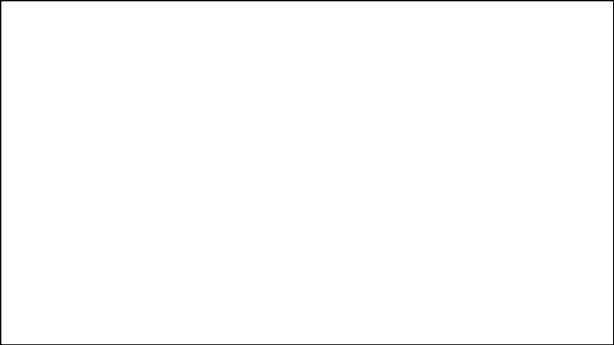


Thyroid and Parathyroids anatomy

By: dr. Ibrahim Falih Noori



Thyroid Gland

❑ The [thyroid](#) is a highly vascular, brownish-red gland located anteriorly in the lower neck, extending from the level of the fifth cervical vertebra down to the first thoracic.

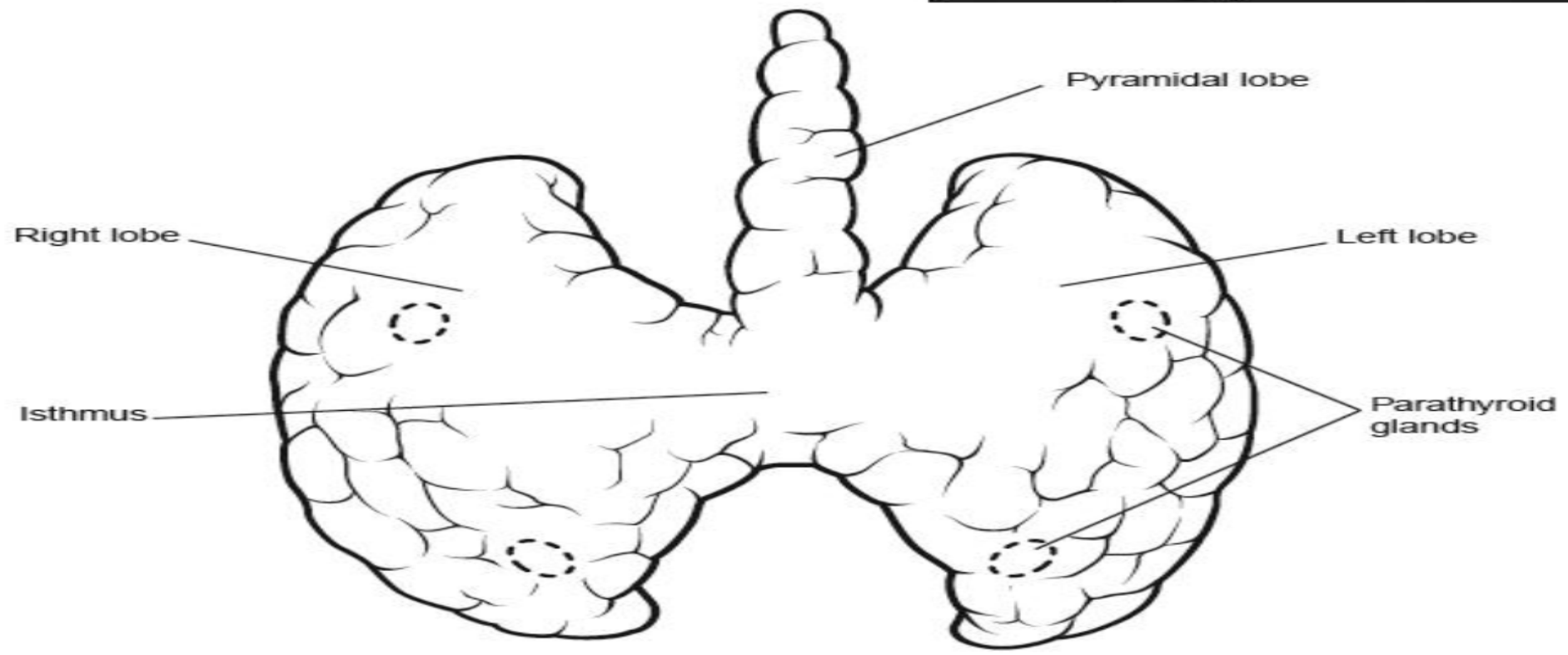
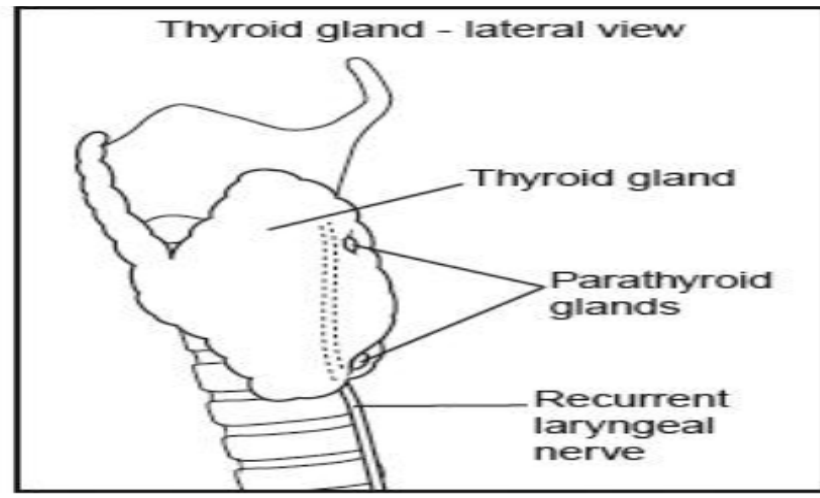
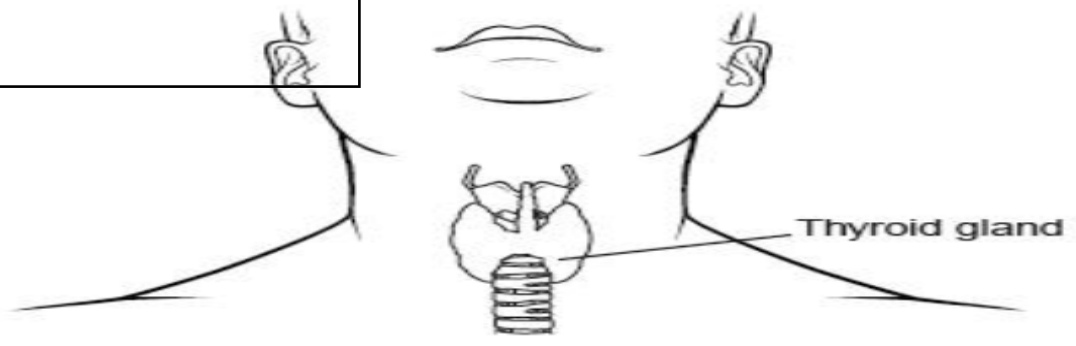
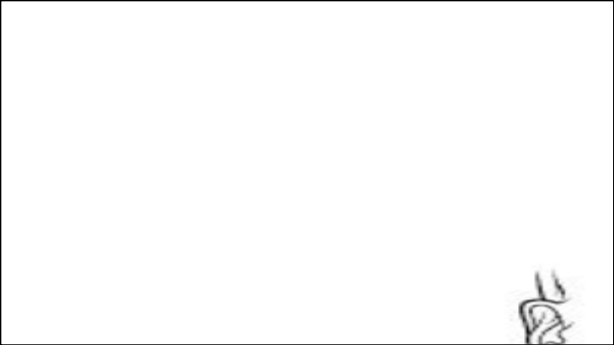
❑ The gland varies from an H to a U shape and is formed by 2 elongated lateral lobes with superior and inferior poles connected by a median isthmus, with an average height of 12-15 mm, overlying the second to fourth tracheal rings.

❑ Each lobe is 50-60 mm long, with the superior poles diverging laterally at the level of the oblique lines on the laminae of the thyroid cartilage.

❑ thyroid weight varies, it averages 25-30 g in adults (it is slightly heavier in women)

❑ Each lobe is pear shaped, with its apex being directed upward as far as the oblique line on the lamina of the thyroid cartilage; its base lies below at the level of the fourth or fifth tracheal ring.

❑ The isthmus extends across the midline in front of the second, third, and fourth tracheal rings. A pyramidal lobe is often present, and it projects upward from the isthmus, usually to the left of the midline.



The normal thyroid gland is immediately caudal to the larynx and encircles the anterolateral portion of the trachea.

The thyroid is bordered by the trachea and esophagus medially and the carotid sheath laterally.

The sternocleidomastoid muscle and the three strap muscles (sternohyoid, sternothyroid, and the superior belly of the omohyoid) border the thyroid gland anteriorly and laterally

Location and relations

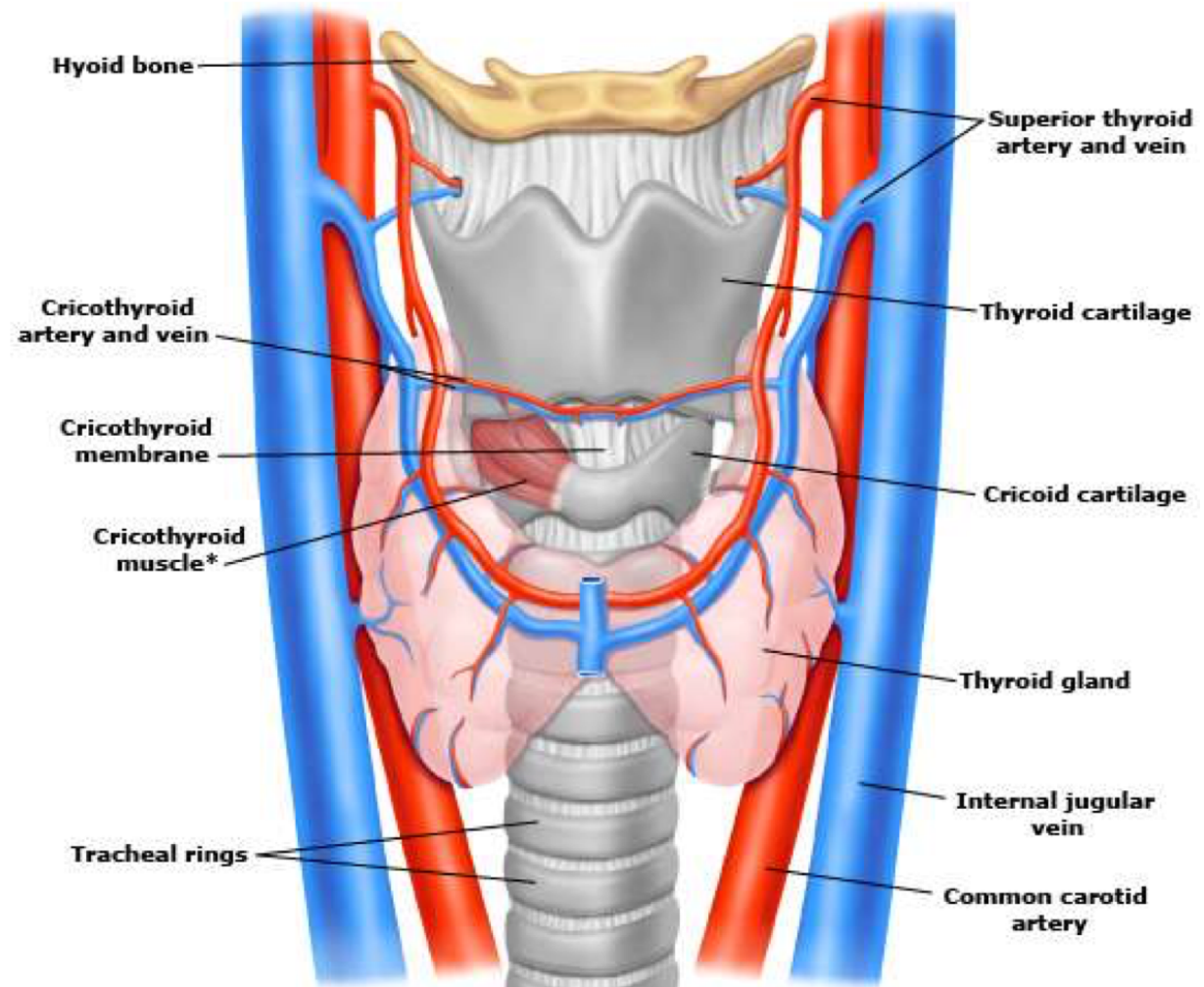
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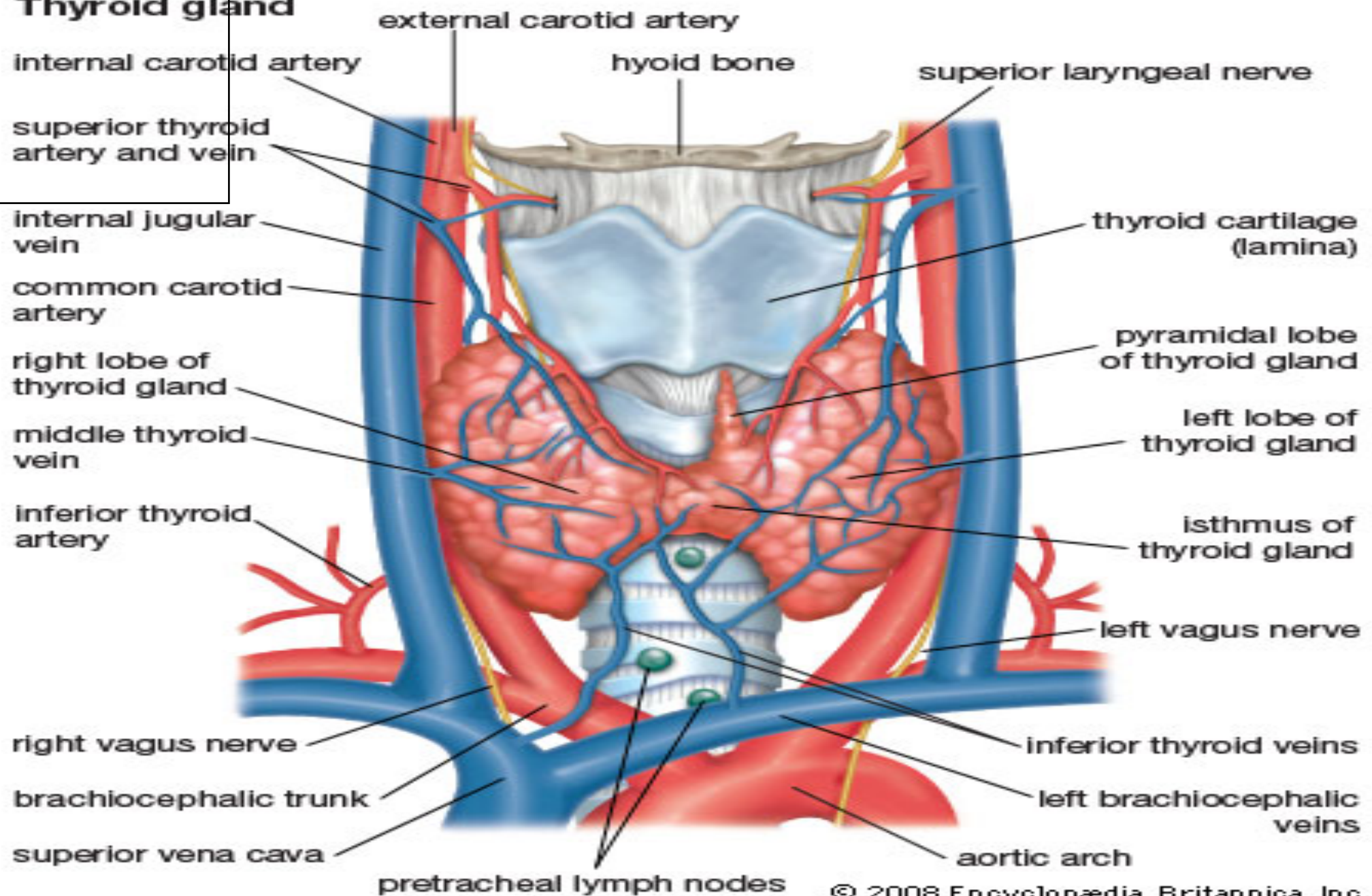
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□ A conical pyramidal lobe often ascends from the isthmus or the adjacent part of either lobe (more often the left) toward the hyoid bone, to which it may be attached by a fibrous or fibromuscular band, the levator of the [thyroid gland](#).

□ Usually, 2 pairs of [parathyroid glands](#) lie in proximity to the thyroid gland.

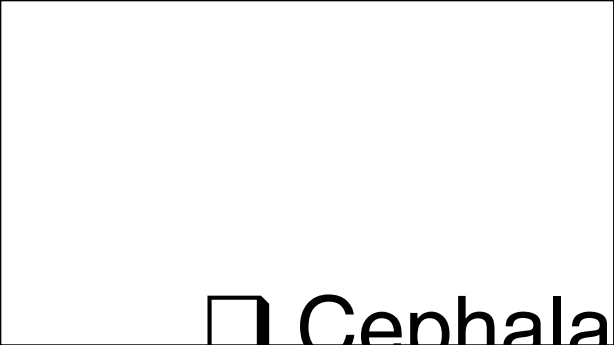


Thyroid gland



Blood supply of thyroid

- **Superior thyroid artery** is the first branch off the external carotid artery. It extends inferiorly to the superior pole of the thyroid lobe.
- In addition to supplying the thyroid, the superior thyroid artery is the primary blood supply to approximately 15 percent of superior parathyroid glands.
- The superior thyroid artery is a landmark for identification of the superior laryngeal nerve, which courses with the artery until approximately 1 cm from the superior thyroid pole



- ❑ Cephalad to the superior pole, the external branch of the superior 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 places this nerve at risk of inadvertent injury, which would produce dysphonia by altering pitch regulation.

- **Inferior thyroid artery** is a branch of the thyrocervical trunk which arises from the subclavian artery.
- The inferior thyroid artery courses posterior to the carotid artery to enter the lateral thyroid. The point of entry can extend from superior to inferior thyroid poles.
- The inferior thyroid artery also supplies the inferior parathyroid glands and approximately 85 percent of superior parathyroid glands.
- The RLN may course anterior or posterior to the inferior thyroid artery. In some cases, the RLN may branch into both an anterior and posterior position.

❑ The inferior thyroid artery has a variable branching pattern and is closely associated with the recurrent laryngeal nerve.

❑ The latter also ascends in the tracheoesophageal groove and enters the larynx between the inferior cornu of the thyroid cartilage and the arch of the cricoid.

❑ The relationship between the nerve and the inferior thyroid artery is highly variable

❑ The nerve can be found deep to the inferior thyroid artery (40%), superficially (20%), or between branches of the artery (35%).

- **Thyroidea ima artery** is found in approximately 3 percent of individuals and arises from the aortic arch or innominate artery and courses to the inferior portion of the isthmus or inferior thyroid poles.

External carotid artery
Superior thyroid artery

Inferior thyroid artery

Thyrocervical trunk

Right subclavian artery

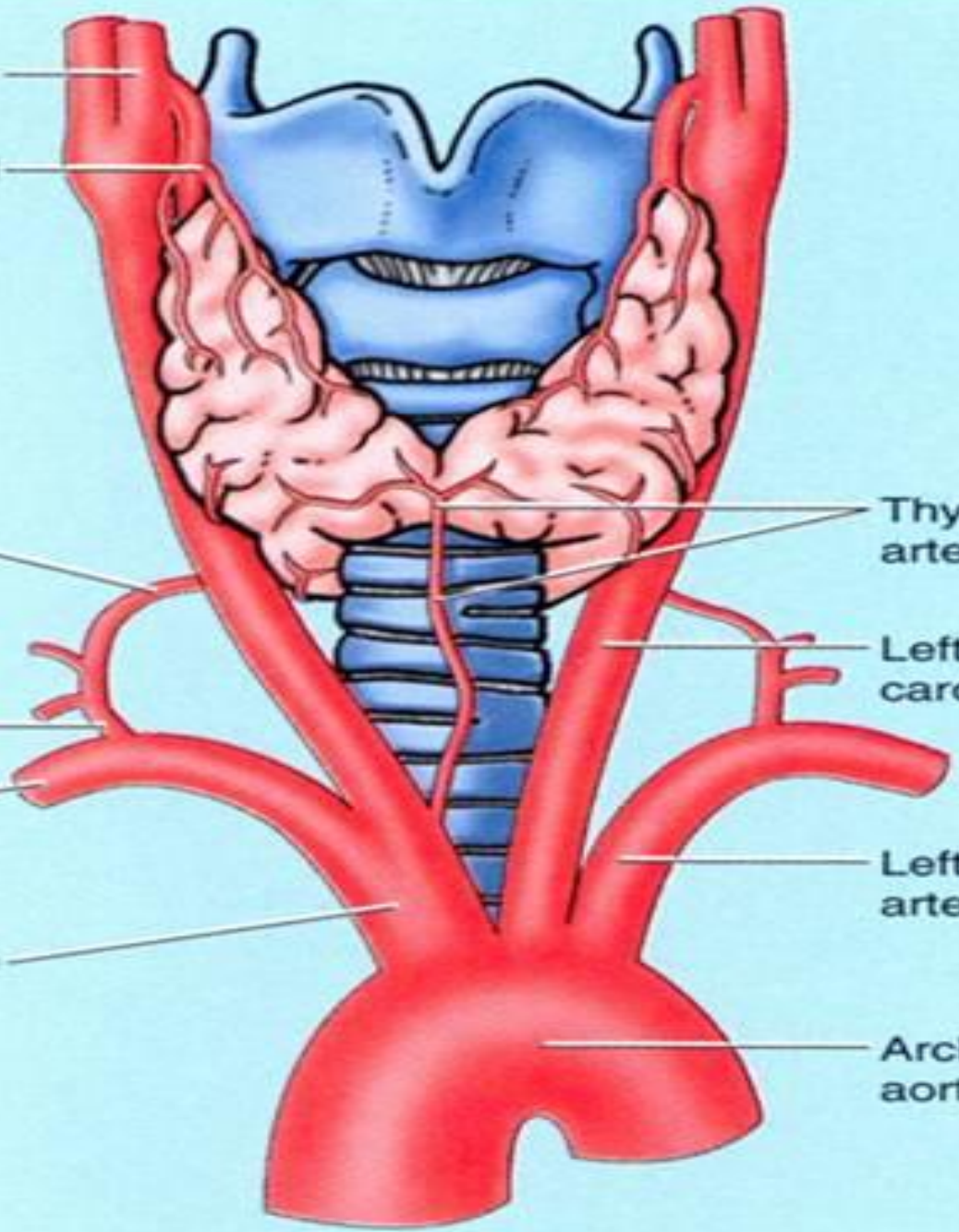
Brachiocephalic artery

Thyroid ima artery

Left common carotid artery

Left subclavian artery

Arch of aorta



Venous drainage

Superior thyroid vein:

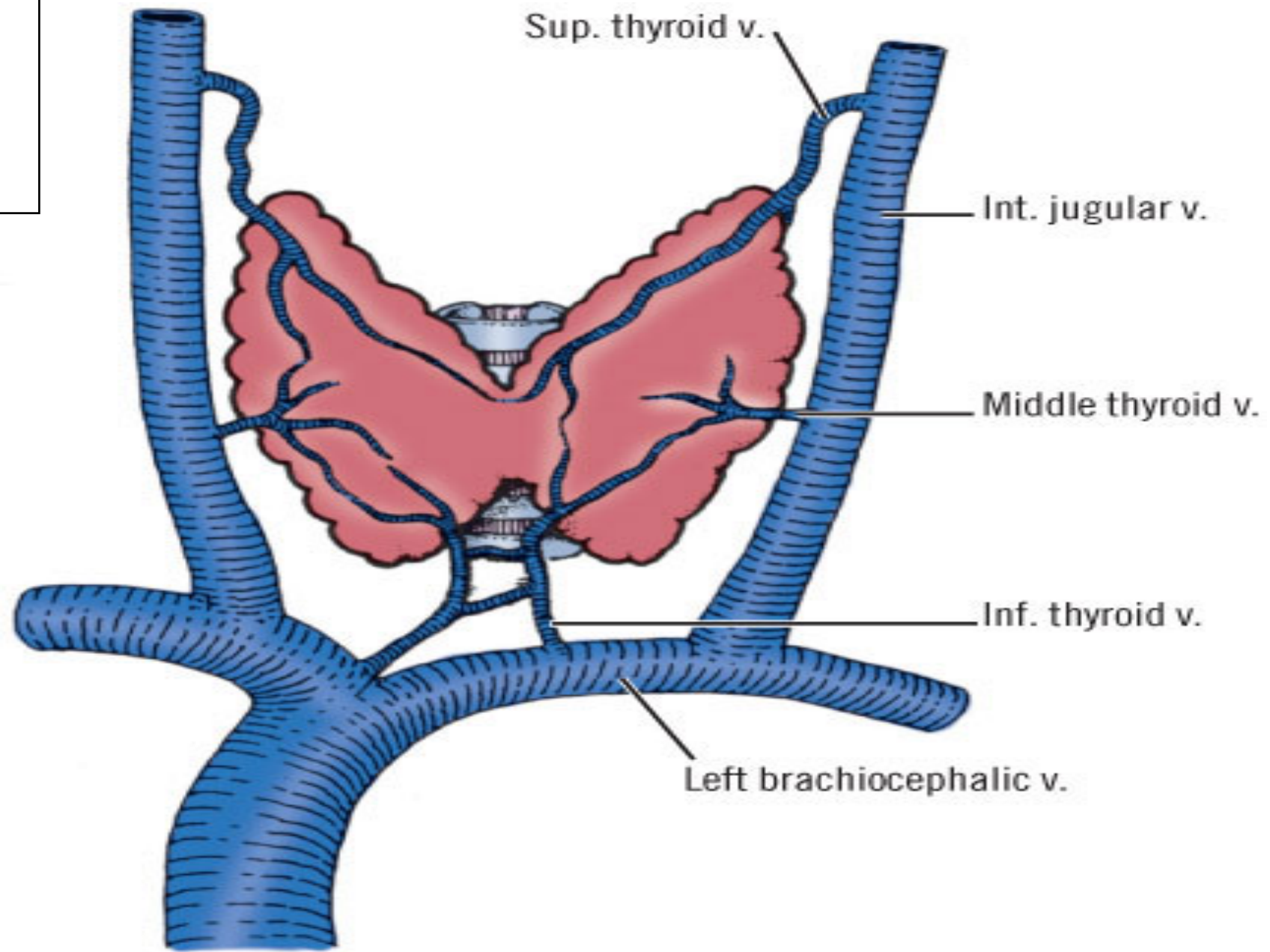
- It arises from the upper part of the lobe.
- It ends into the internal jugular vein.

Middle thyroid vein:

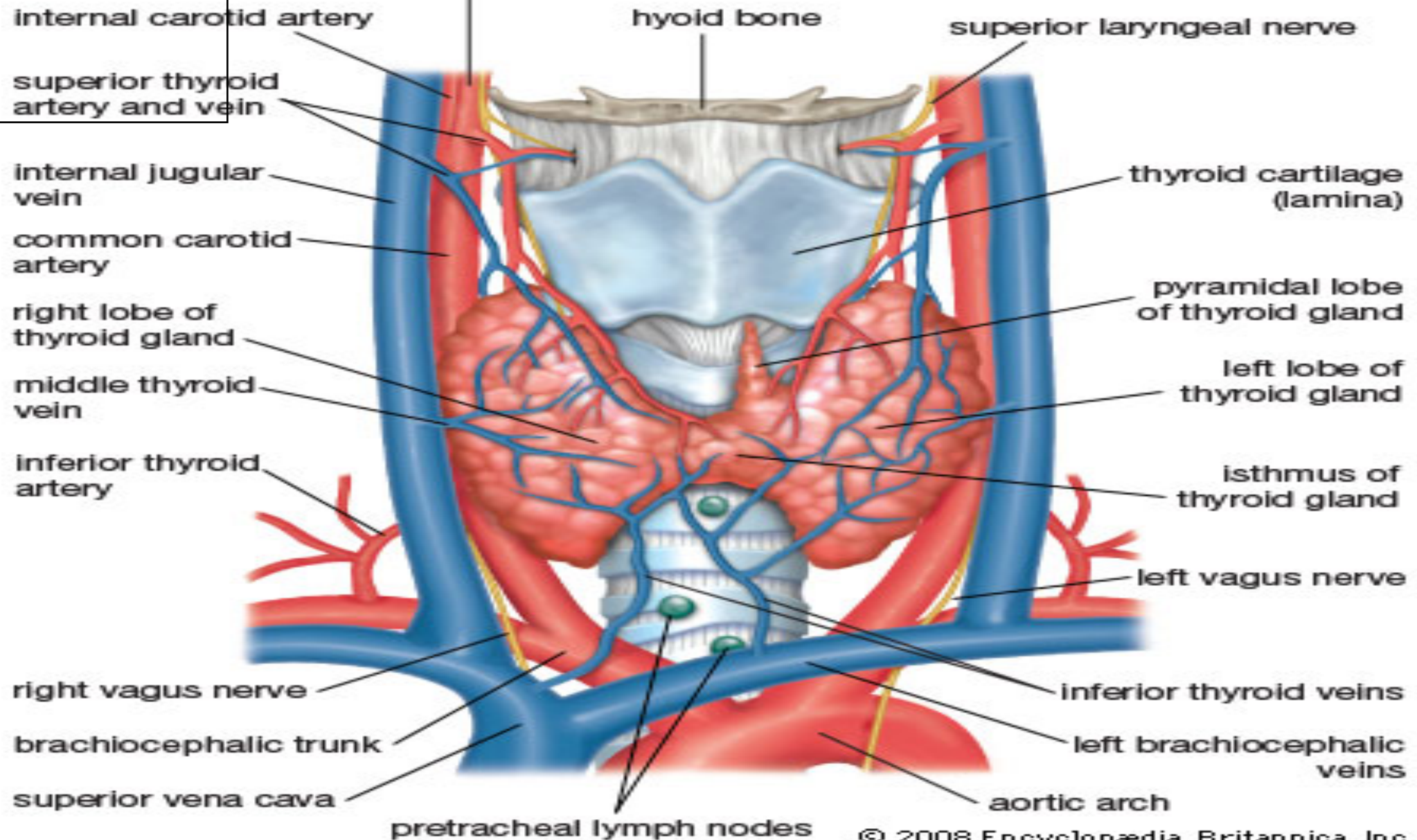
- It arises from the middle of the lobe.
- It ends into the internal jugular vein.

Inferior thyroid veins:

- Arise from the isthmus and lower parts of the lobes.
- Descend in front of the trachea.
- End into the left brachiocephalic vein.

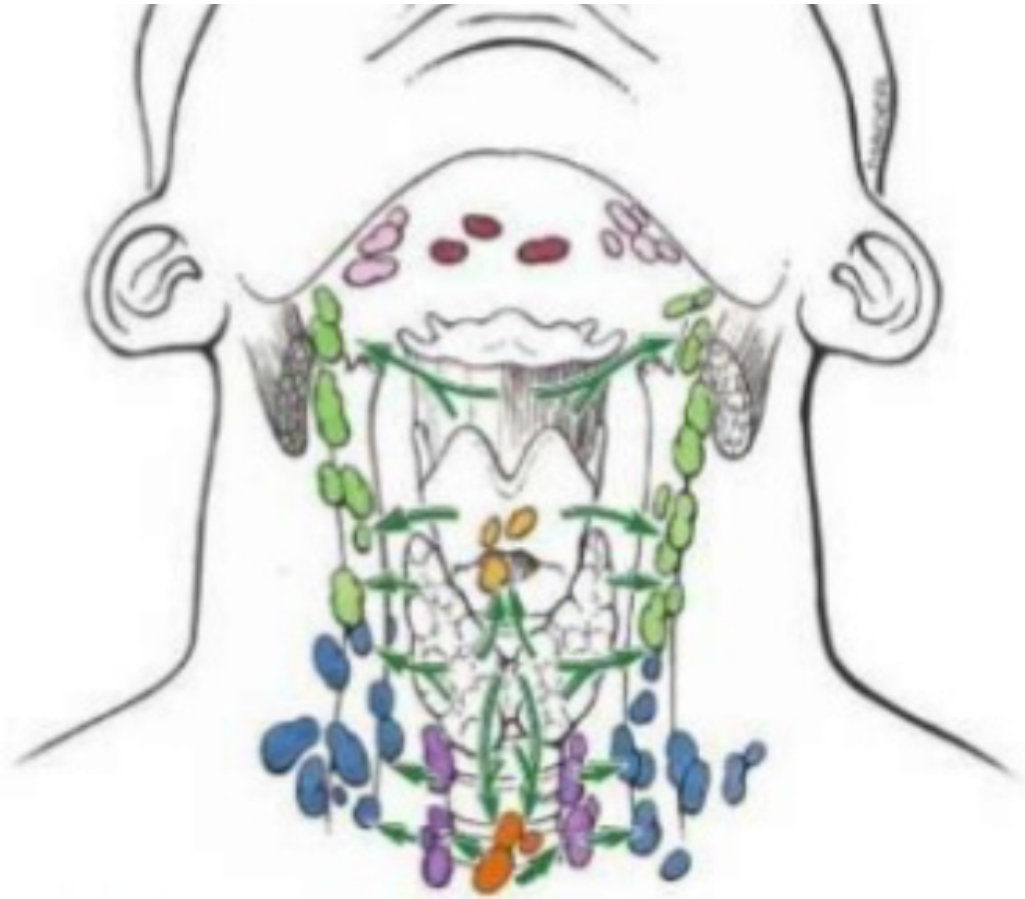









Thyroid gland



LYMPHATIC DRAINAGE

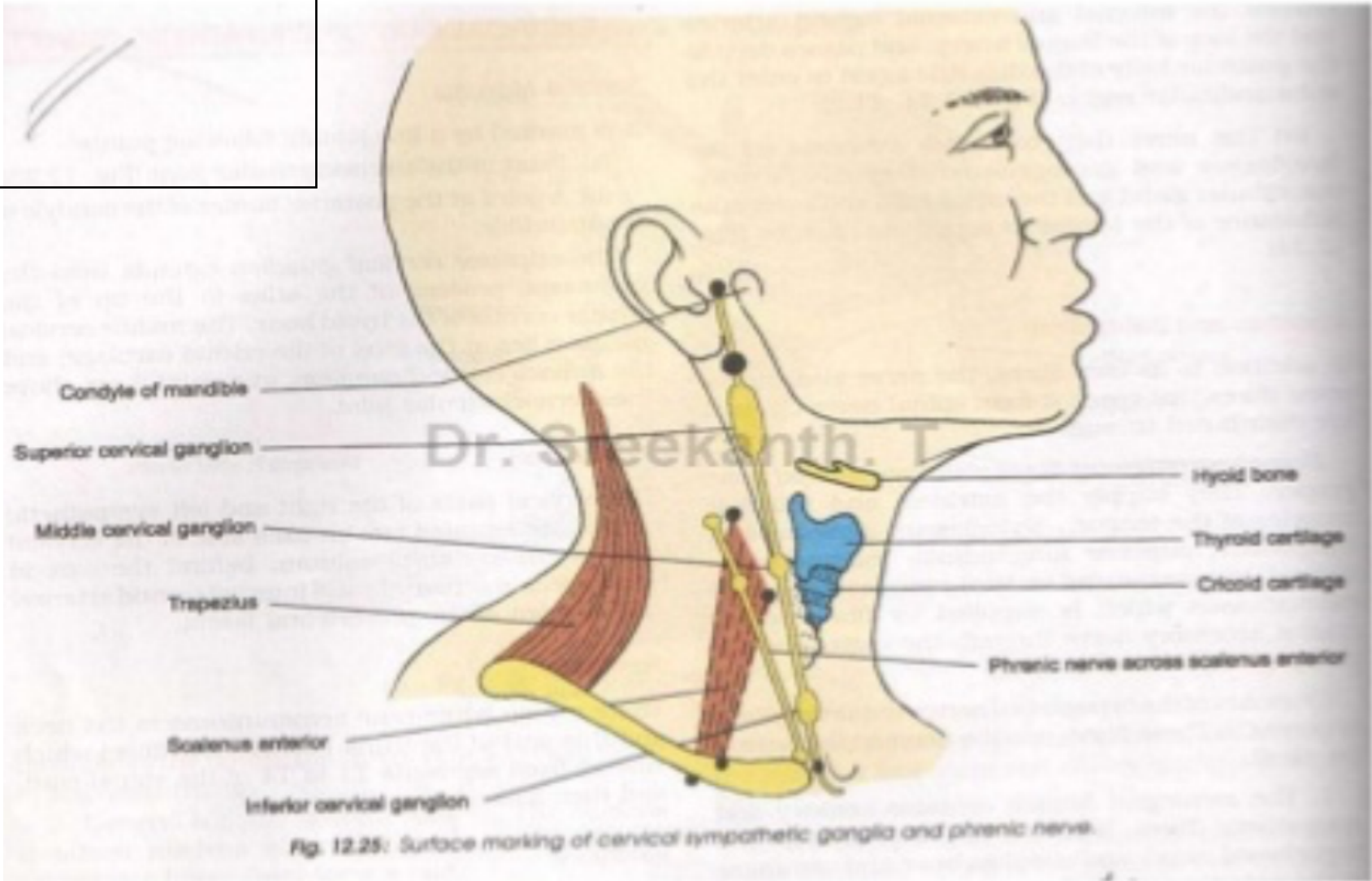
- Extensive, multidirectional flow
- periglandular → prelaryngeal (Delphian) → pretracheal → paratracheal (along RLN) → brachiocephalic (sup mediastinum) → deep cervical → thoracic duct
- Upper part via prelaryngeal LN to upper deep CLN
- Lower part via pretracheal and paratracheal LN to lower deep CLN
- Brachiocephalic LN and thoracic duct
- regional metastasis of thyroid carcinoma are **superior and lateral**, along IJV ie: invasion of the pretracheal and paratracheal LNs and obstruction of normal lymph flow



	Superior deep cervical		Prelaryngeal
	Inferior deep cervical		Paratracheal
	Submental		Pretracheal
	Submandibular		

Innervation

- Sympathetic vasoconstrictor innervations mainly from middle cervical ganglia and partly from superior and inferior cervical ganglia.
- Parasympathetic innervations via cardiac and laryngeal branches of vagus nerve.
- No secretomotor innervations (secretion regulated by TSH)



Effects of thyroid hormone

- Fetal brain and skeletal maturation
- Increase in basal metabolic rate
- Increases sensitivity to catecholamines
- Stimulates gut motility
- Increase bone turnover
- Increase in serum glucose, decrease in serum cholesterol

Goiter : is abnormal enlargement of thyroid regardless the function



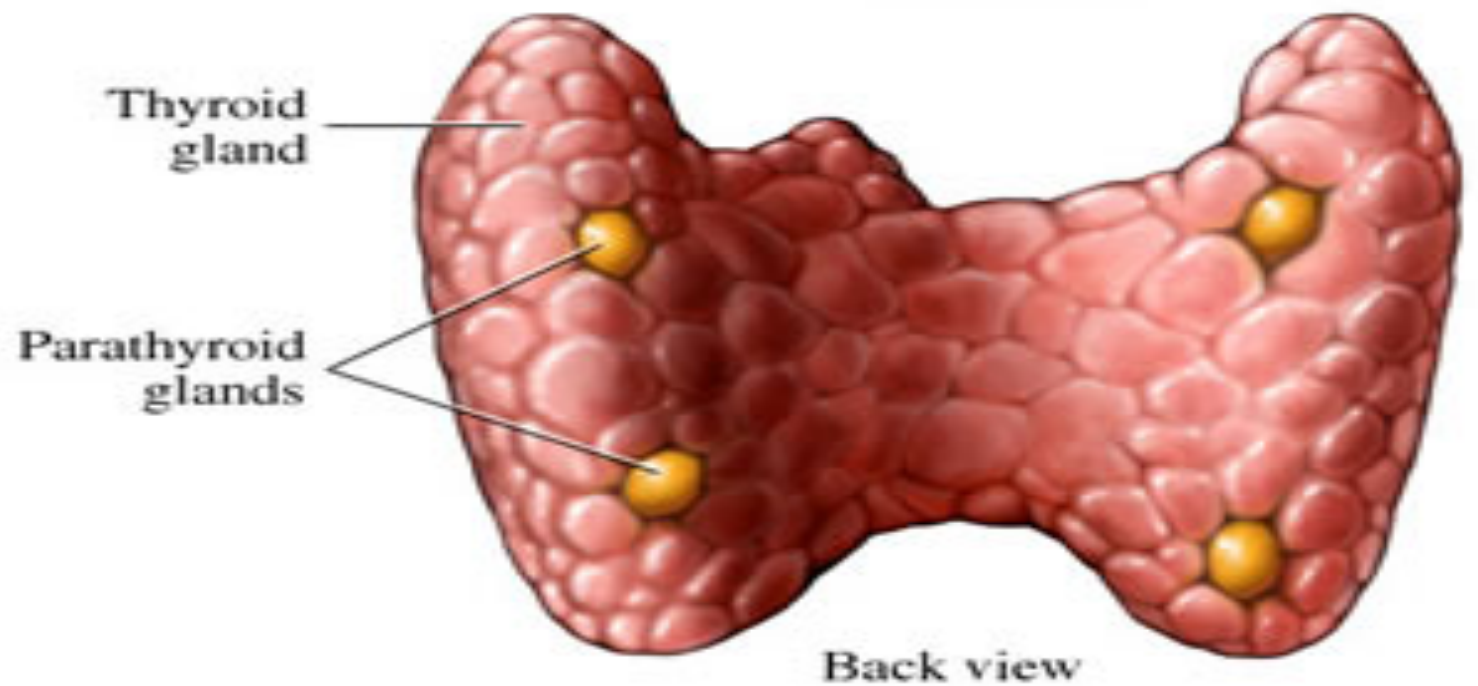
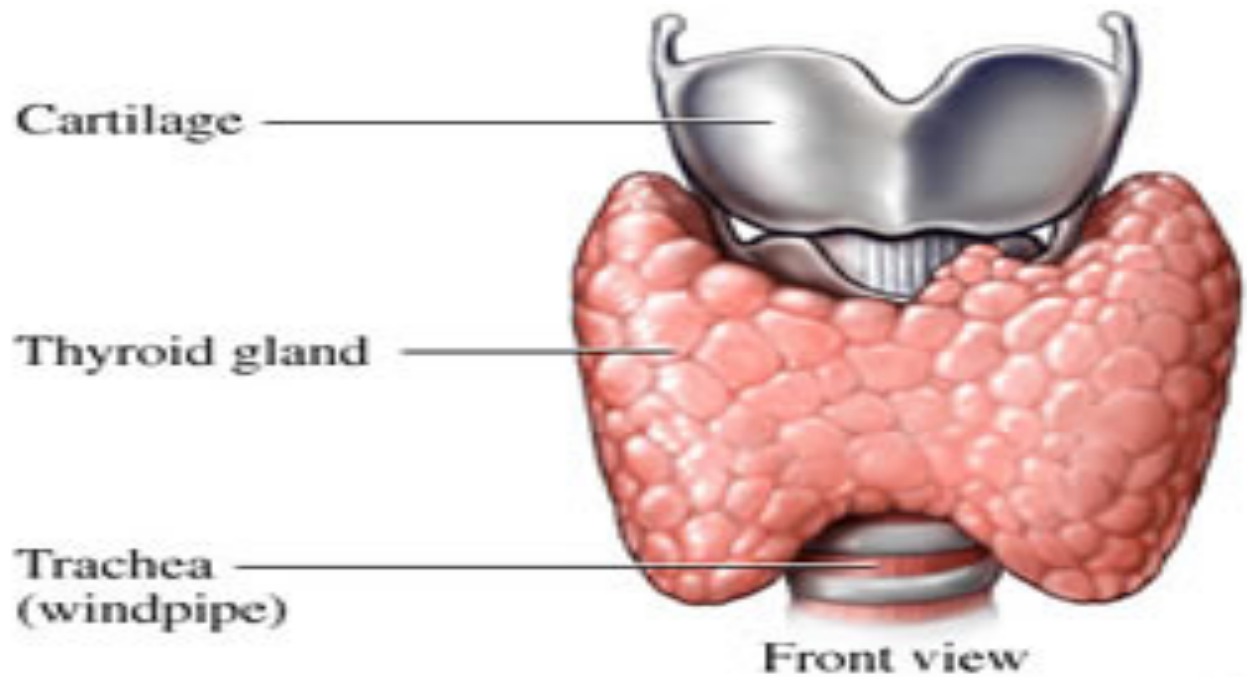
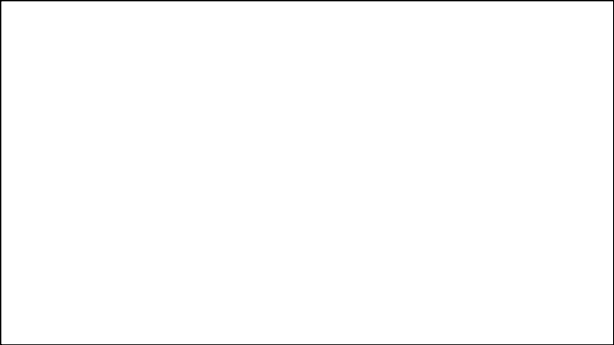
Hyperthyroidism & hypothyroidism



Parathyroid glands anatomy

- ❑ Four parathyroid glands are found near the posterior aspect of the [thyroid gland](#).
- ❑ They are small (20-40 mg) and have a beanlike shape.
- ❑ These 4 glands produce parathyroid hormone (PTH), which helps to maintain calcium homeostasis by acting on the renal tubule as well as calcium stores in the skeletal system and by acting indirectly on the gastrointestinal tract through the activation of vitamin D.

- ❑ The parathyroid glands have a distinct, encapsulated, smooth surface that differs from the thyroid gland, which is has a more lobular surface.
- ❑ The color of the parathyroid glands is typically light brown to tan, which relates to their fat content, vascularity, and percentage of oxyphil cells within the glands

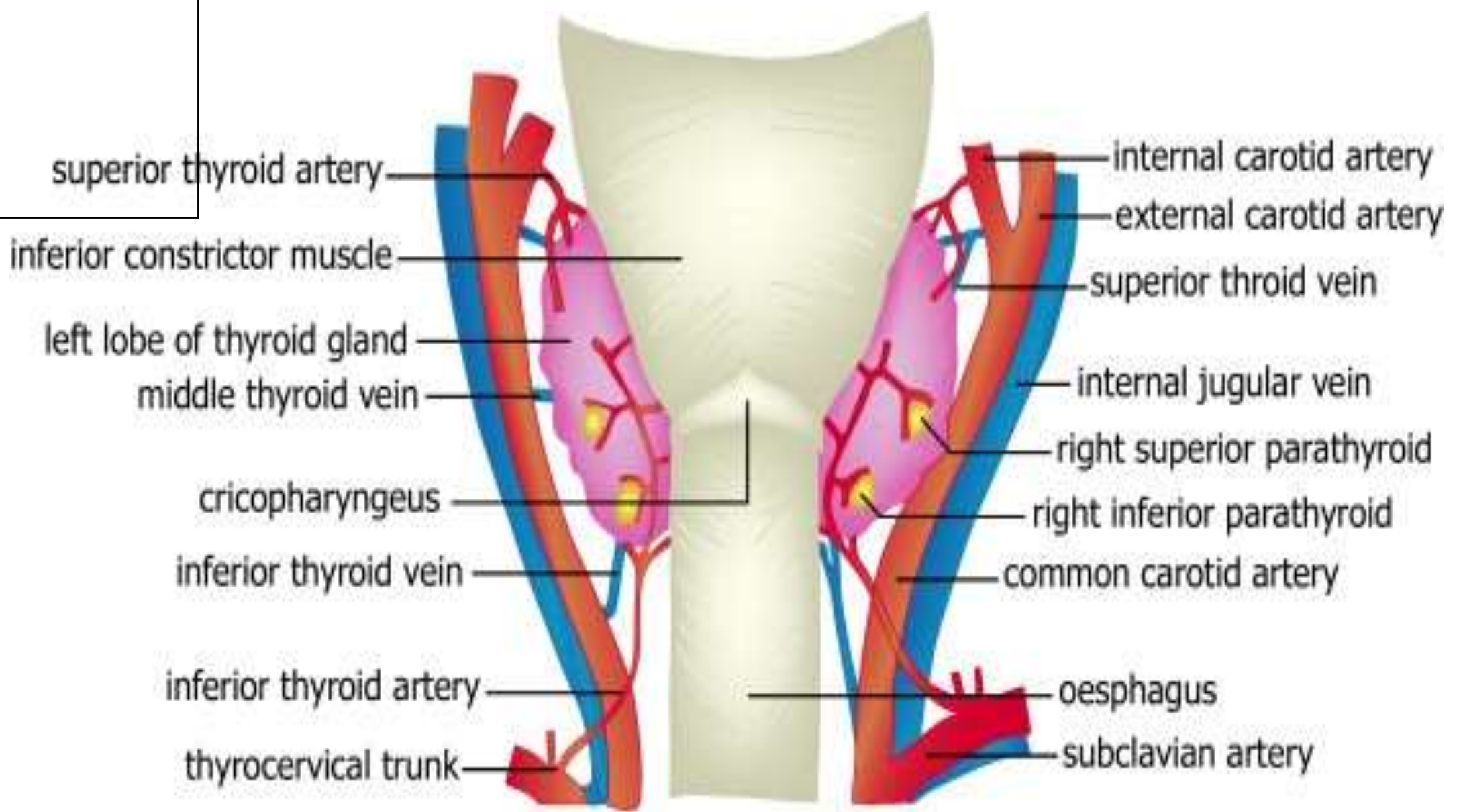


- Parathyroids

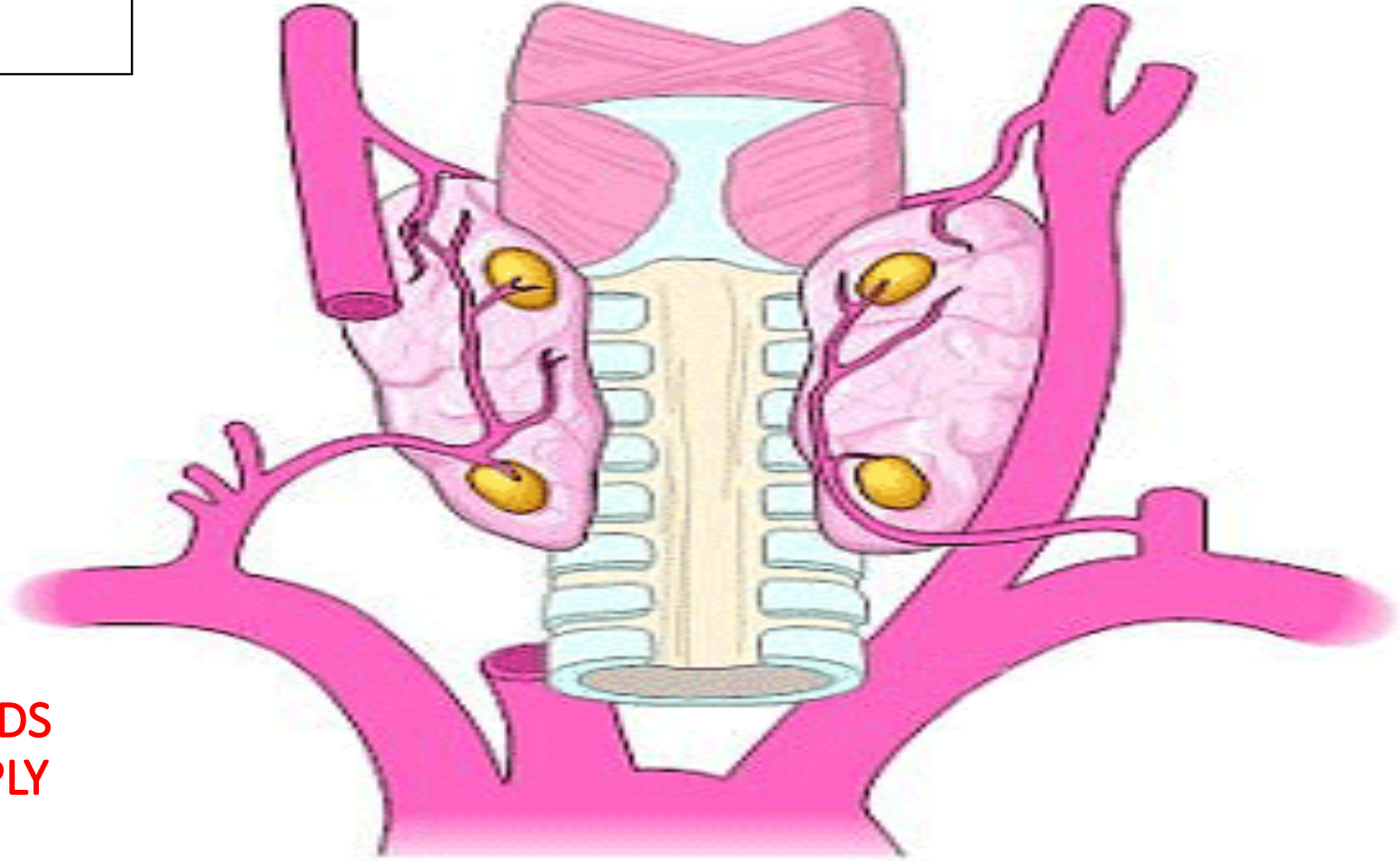
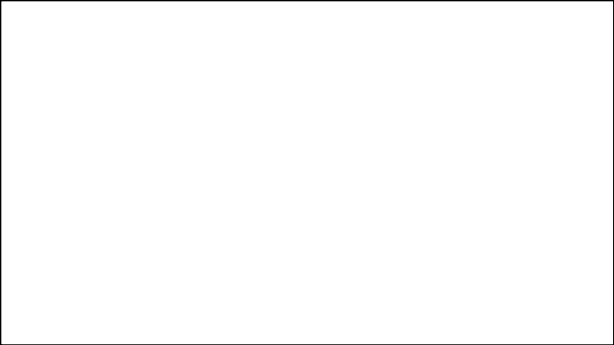
- ❑ The superior parathyroid glands are most commonly located in the posterolateral aspect of the superior pole of the thyroid gland at the cricothyroidal cartilage junction. They are most commonly found 1 cm above the intersection of the inferior thyroid artery and the recurrent laryngeal nerve..
- ❑ The inferior parathyroid glands are more variable in location and are most commonly found near the lower thyroid pole of the thyroid.

Parathyroids blood supply

- ❑ The inferior parathyroid gland is supplied by the inferior thyroid artery from the thyrocervical trunk.
- ❑ The superior parathyroid gland is also usually supplied by the inferior thyroid artery or by an anastomotic branch between the inferior thyroid and the superior thyroid artery.



Schematic diagram of the posterior view of the thyroid showing the parathyroid glands and their blood supply



PARATHYROIDS
BLOOD SUPPLY