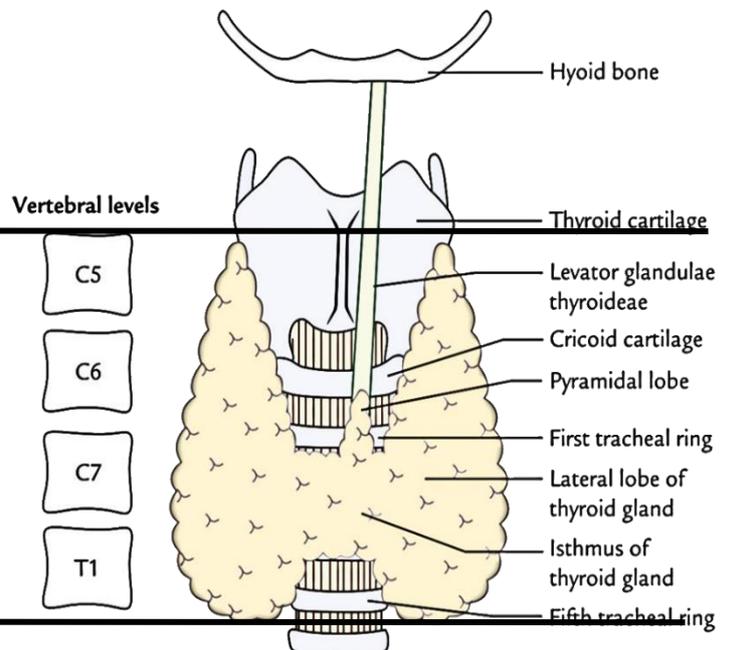
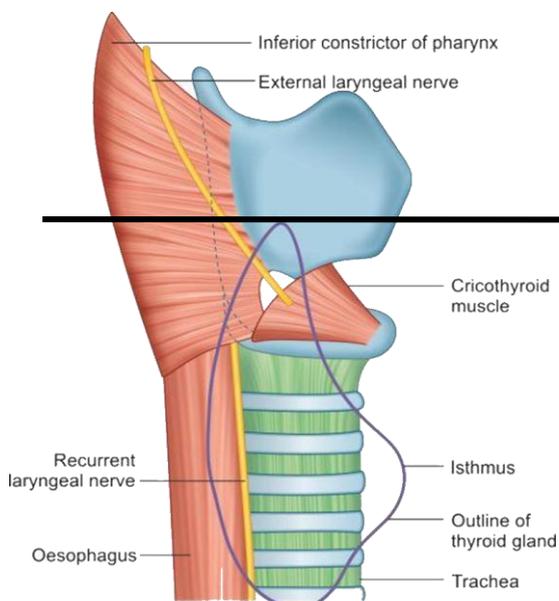
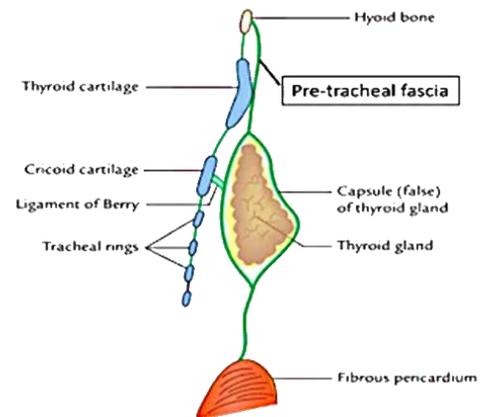
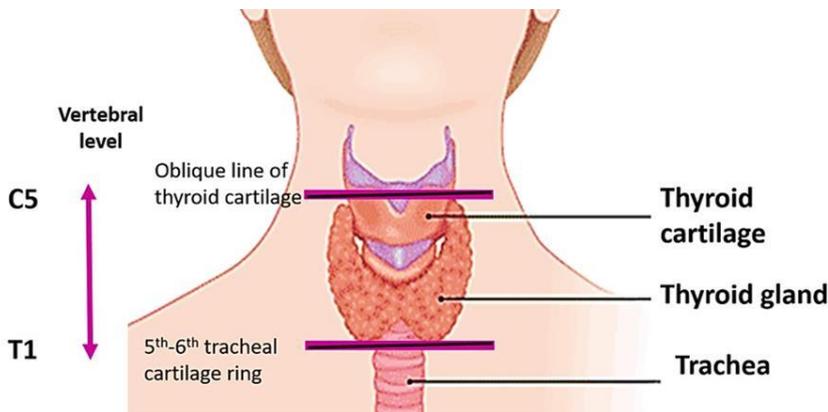


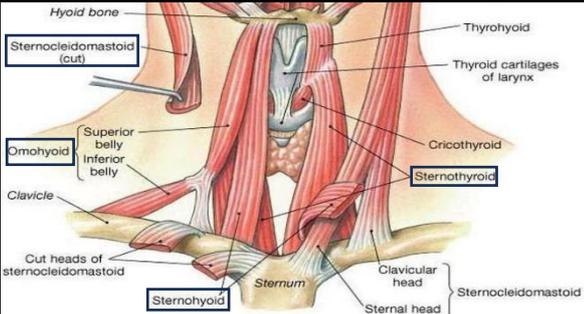
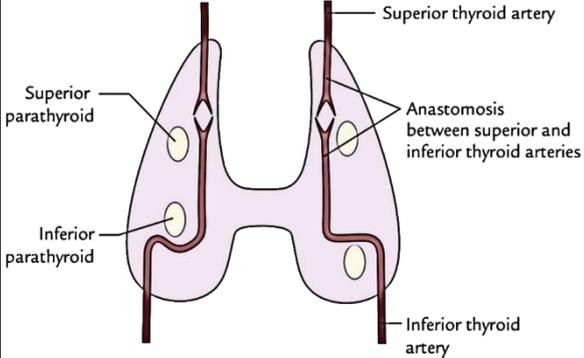
Anatomy & Development of Thyroid & Parathyroid gland

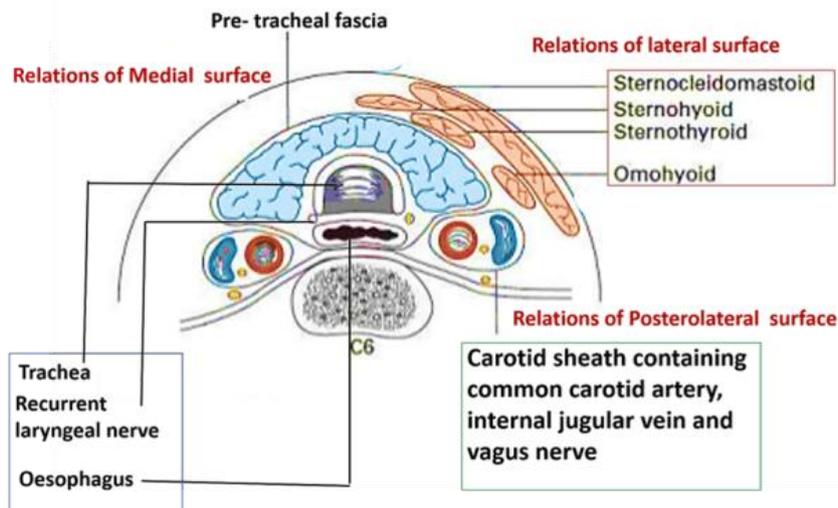
Anatomy of the Thyroid gland

Site	In the lower part of front of neck	
Extent	Infront	Behind
	Extending from middle of thyroid cartilage to 5th tracheal ring	Opposite 5th, 6th, 7th cervical vertebrae & 1st thoracic vertebra
Shape	Butterfly in shape	
Parts	<ul style="list-style-type: none"> • Right & Left lobes • Isthmus connecting the two lobes • Pyramidal lobe (from upper border of isthmus) 	
Capsule	True capsule	False capsule
	Condensation of connective tissue of the gland.	A sheath of pretracheal fascia , which fixes the gland to hyoid bone, thyroid & cricoid cartilage (the gland moves up and down with swallowing).



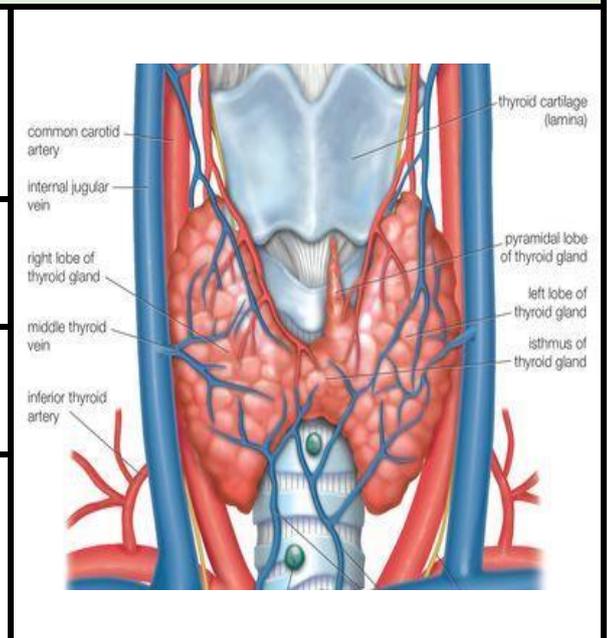
Surfaces, borders & Relations of the Thyroid gland

Surfaces		
Lateral (superficial) surface	<ul style="list-style-type: none"> • Upper: Superior belly of omohyoid • Middle: Sternohyoid & Sternothyroid • Lower: Sternomastoid 	
Posterior surface	<p>Carotid sheath (contents medial to lateral): Common carotid artery – Vagus nerve – Internal jugular vein</p>	
Medial surface	Upper part	<ul style="list-style-type: none"> • Larynx • Pharynx • External laryngeal nerve (in between)
	Lower part	<ul style="list-style-type: none"> • Trachea • Esophagus • Recurrent laryngeal nerve (in between)
Borders		
Anterior border	Related to anterior branch of superior thyroid artery .	
Posterior border	Related to parathyroid glands , inferior thyroid artery & anastomosis between superior & inferior thyroid arteries	



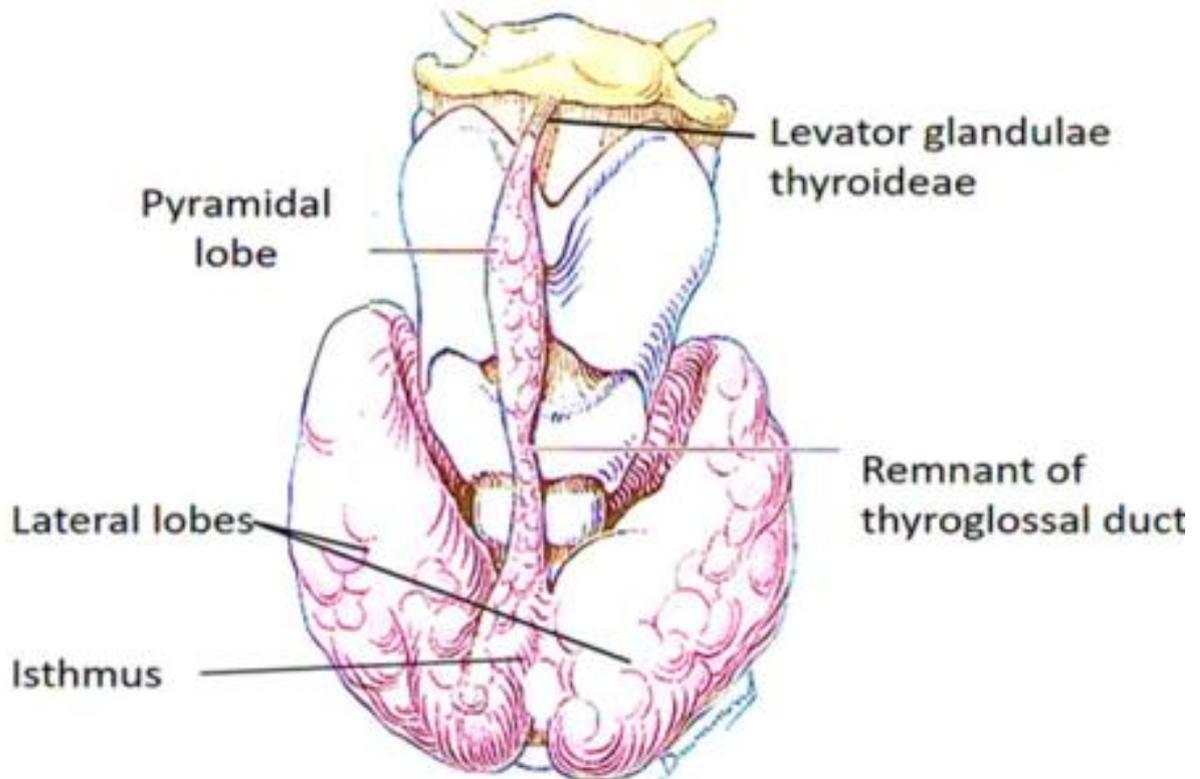
Isthmus (connects the two lobes)

Anterior surface	<ul style="list-style-type: none"> • Sternohyoid • Anterior jugular veins. • Sternothyroid
Posterior surface	2 nd , 3 rd & 4 th tracheal rings
Upper border	Shows anastomosis between the two superior thyroid arteries
Lower border	Related to inferior thyroid veins , thyroidea ima , anastomosis between inferior thyroid arteries



Pyramidal lobe

- It's a small conical process that extends from the upper border of the isthmus.
- It's connected to the hyoid bone by a fibromuscular band, the **levator glandulae thyroidea**.



Arterial supply of the Thyroid gland

Superior Thyroid artery		Inferior thyroid artery
Origin	External carotid artery	Thyrocervical trunk from 1st part of subclavian artery.
Accompanied with	External laryngeal nerve	Recurrent laryngeal nerve
Termination	In apex by dividing into: <ul style="list-style-type: none"> - <u>Anterior branch</u>: anastomoses with its fellow of the opposite side. - <u>Posterior branch</u>: anastomoses with inferior thyroid artery. 	Anastomoses with the posterior branch of superior thyroid artery
Branches	<ol style="list-style-type: none"> 1. <u>Glandular</u> to: <ul style="list-style-type: none"> - Apex - Upper $\frac{1}{3}$ of thyroid lobe - Upper $\frac{1}{2}$ of isthmus 2. <u>Superior laryngeal artery</u>: Pierces the thyrohyoid membrane 3. <u>Infrahyoid artery</u> 4. <u>Artery to sternomastoid</u> 5. <u>Artery to cricothyroid</u> 	<ol style="list-style-type: none"> 1. <u>Glandular</u> to: <ul style="list-style-type: none"> - Base - Lower $\frac{2}{3}$ of thyroid lobe - Lower $\frac{1}{2}$ of isthmus 2. <u>Inferior laryngeal artery</u> 3. <u>Parathyroid gland</u> 4. <u>Tracheal and esophageal branches</u> 5. <u>Ascending cervical artery</u>: Anterior to scalenus anterior

Thyroid ima artery

- It may be present.
- **Origin**: it arises either from the **arch of aorta** or from the **brachiocephalic artery**.
- Ascends in front of the trachea to supply the **isthmus**.
- It is a potential source of bleeding when performing procedures in the midline of the neck inferior to the isthmus

N.B. Accessory thyroid arteries: From the esophageal and tracheal branches.

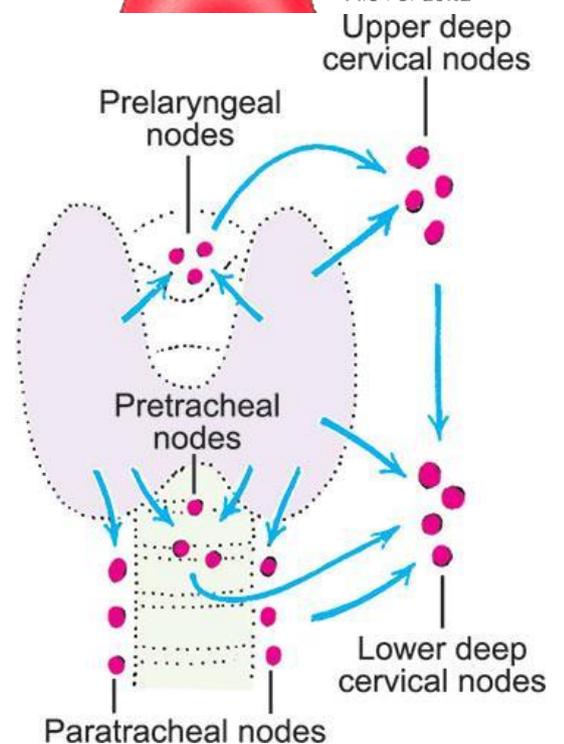
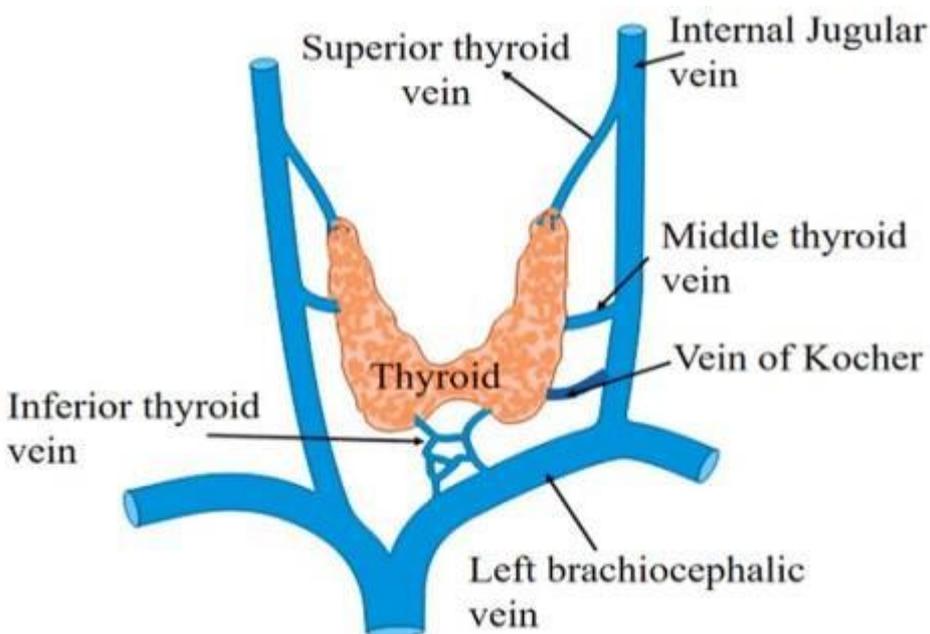
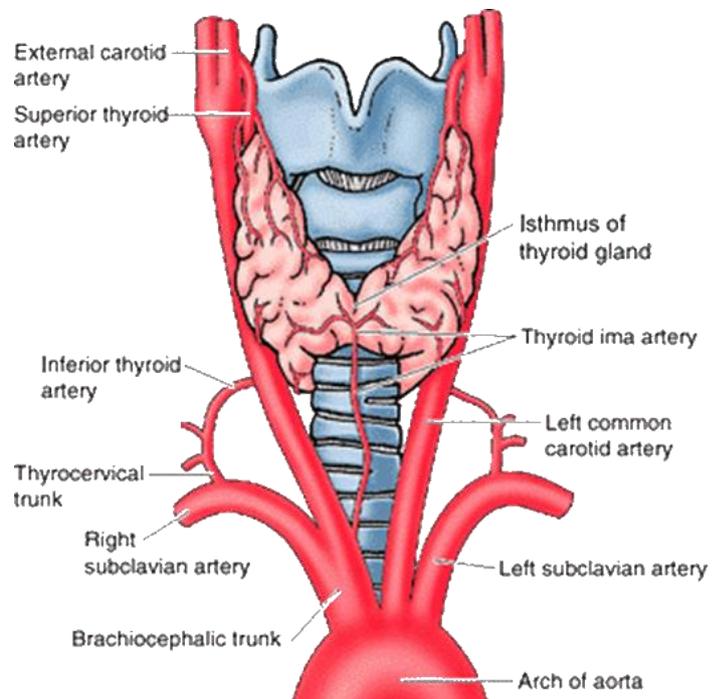
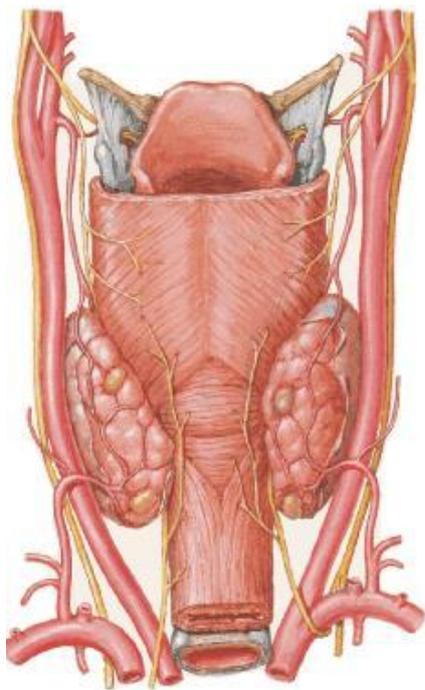
Venous drainage of the Thyroid gland

Superior thyroid vein	Ends in	Internal Jugular vein
Middle thyroid vein		Internal Jugular vein
Inferior thyroid vein		Brachiocephalic vein

Lymphatic drainage of the Thyroid gland

Upper parts	Upper and deep cervical lymph nodes.
Lower parts	Lower deep cervical lymph nodes.
Isthmus	Pretracheal lymph nodes.

Posterior View



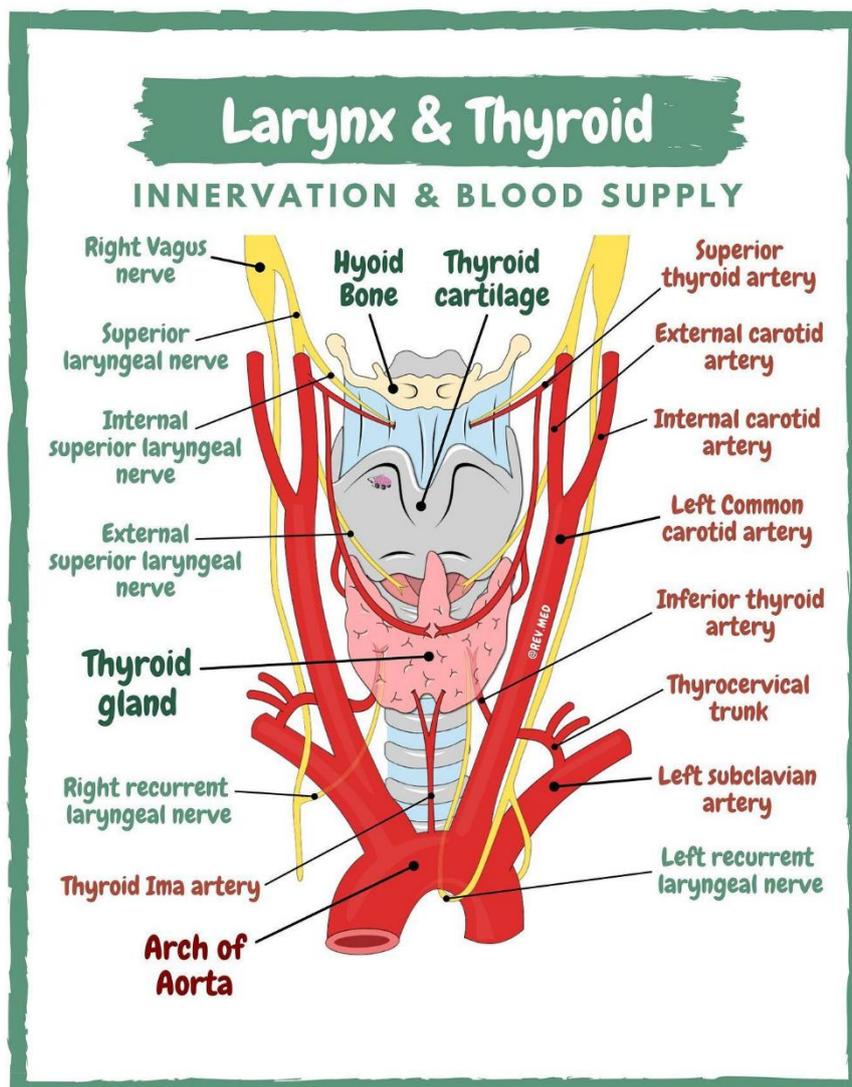
Clinical applied of the Thyroid gland

- **Injury of laryngeal nerves** during thyroidectomy may cause hoarseness of voice.
- **Try to avoid:**
 - **External laryngeal n** while ligating **superior thyroid artery** by ligating it **near to** the gland (as it lies away from the nerve at that position).
 - **Recurrent laryngeal n** while ligating **inferior thyroid artery** by ligating it **away from** the gland (as it lies away from the nerve at that position).

N.B.

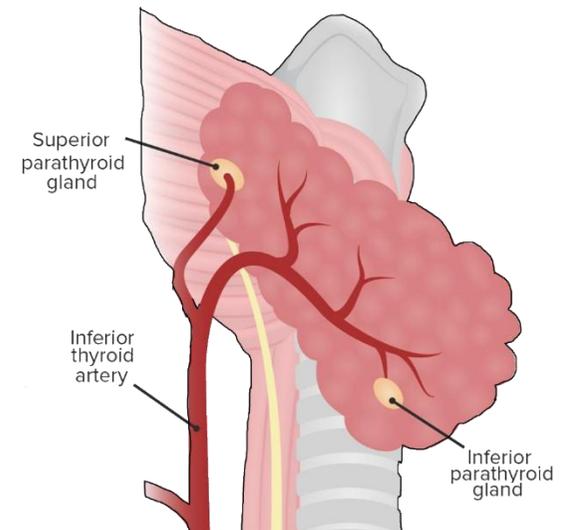
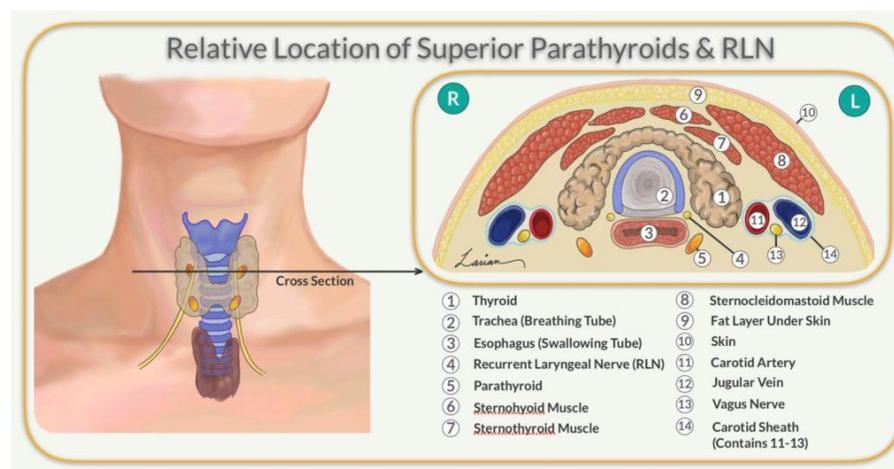
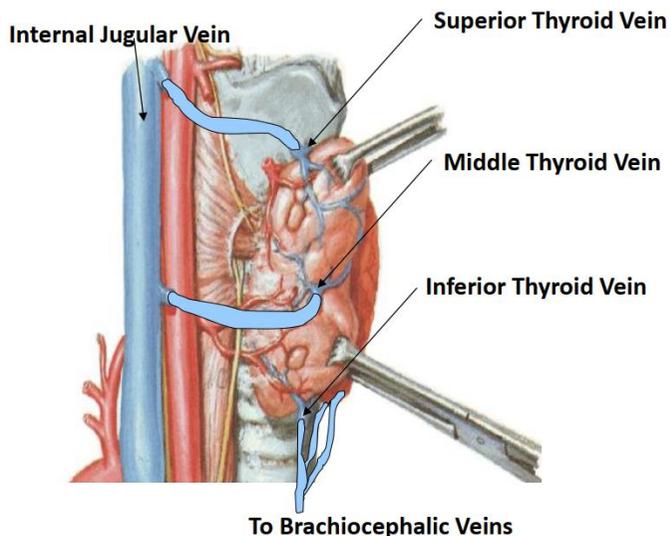
1. **Unilateral or partial injury of recurrent laryngeal nerve** → transient hoarseness of voice.

2. **Bilateral nerve injury of recurrent laryngeal nerve** → severe respiratory distress and stridor requiring immediate airway management and potential tracheostomy.



Parathyroid gland

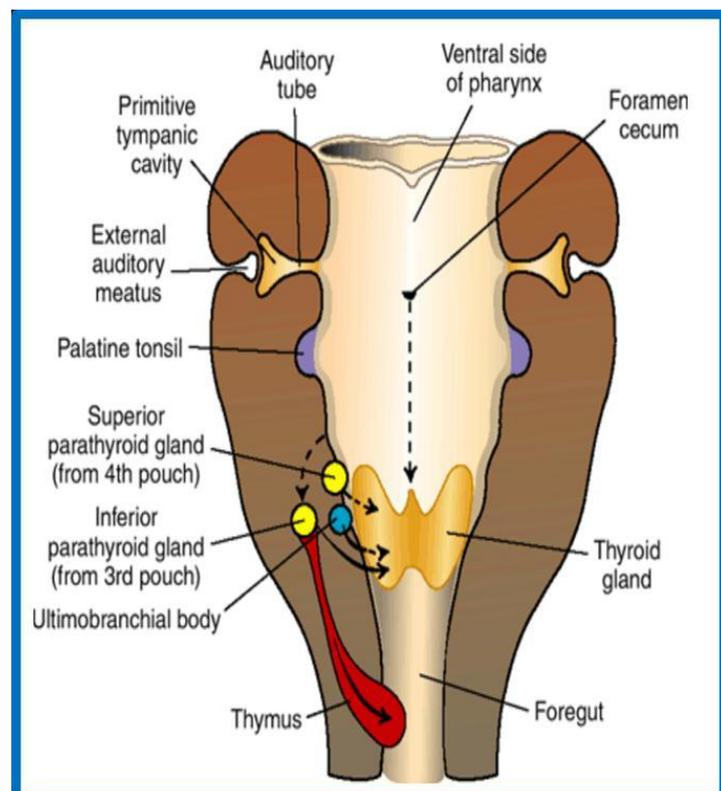
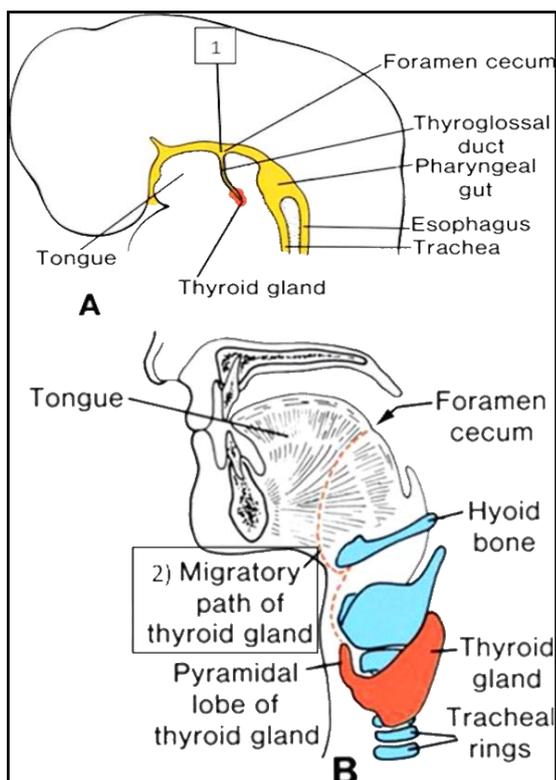
Site	Two superiors	More constant in position & lies at the level of the middle of the posterior border of the thyroid gland , usually at the level of the inferior border of the cricoid cartilage.
	Two inferiors	Usually lie close to the inferior poles of the thyroid gland.
		May lie within the fascial sheath , embedded in the thyroid substance, or outside the fascial sheath.
		May be found some distance caudal to the thyroid gland, in association with the inferior thyroid veins & recurrent laryngeal n , or they may in the superior mediastinum in the thorax
Features	<ul style="list-style-type: none"> The parathyroid glands are ovoid bodies measuring about 6 mm in their greatest diameter. They are four in number and are closely related to the posterior border of the thyroid gland, lying within its fascial capsule. 	
Blood supply	Arterial supply	From superior and inferior thyroid arteries mainly inferior thyroid arteries .
	Venous drainage	Drains into the thyroid plexus of veins of the thyroid gland and trachea.



Development of the Thyroid gland

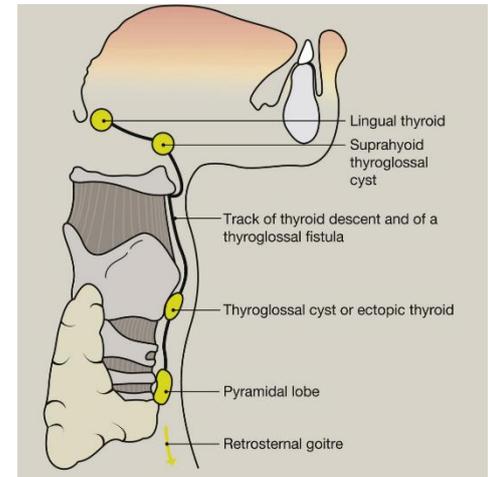
- Time of development: **4th week**.
- Steps:
 - 1) **Median bilobed diverticulum** in floor of primitive pharynx between the processes of tongue
 - 2) It **descends** ventral to pharynx, hyoid & thyroid cartilage
 - 3) During its migration, it is still **connected** to tongue with **thyroglossal duct**
 - 4) It reaches its **final position** in front of trachea **in 7th week**
 - 5) In that time, it is formed of 2 lobes with a narrow isthmus
 - 6) **Thyroglossal duct** disappears except:
 - Foramen cecum of tongue at its proximal part
 - Pyramidal lobe & levator glandulae thyroidea at its distal part
 - 7) Gland becomes functioning at **12th week** with **colloid- filled follicles**
 - 8) **Parafollicular cells, (C cells)**
secreting calcitonin, derived from **ultimobranchial body** at **5th pouch**

N.B. **ultimobranchial body** is an out pocketing of the fourth pharyngeal pouch that fuses with the thyroid diverticulum, giving rise to calcitonin-producing C-cells



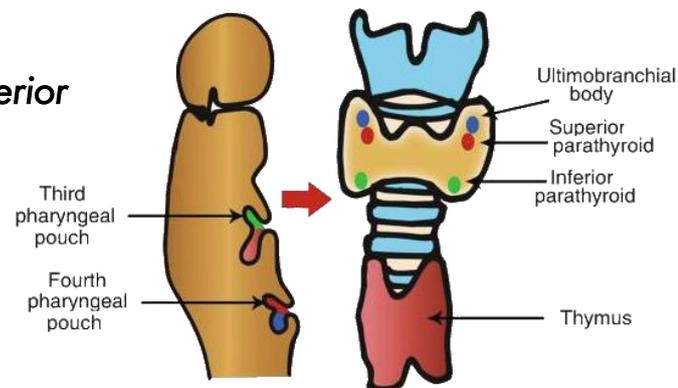
Anomalies of the Thyroid gland

- Aplasia or Hypoplasia
- Aberrant thyroid gland: found along path of thyroid descent:
 - **Lingual thyroid**: found at base of tongue due to failure of descent
 - **Retrosternal thyroid**: due to excessive descent
- Thyroglossal duct anomalies:
 - **Thyroglossal cyst**: found along path of thyroid descent at midline
 - **Thyroglossal fistula**: opening at midline of neck



Development of parathyroid gland

- Embryologically, the parathyroid glands **derive from the endoderm of the third and fourth pharyngeal pouches**
- The **third pharyngeal pouch** gives rise to the **inferior parathyroids**.
- The **fourth pharyngeal pouch** gives rise to the **superior parathyroids**.



Quiz

1) Superior thyroid artery arises from which artery:

- A- Internal carotid
- B- External carotid
- C- Subclavian
- D- Vertebral

Answer: B

2- Thyroid gland reaches its final position in front of trachea in which week:

- A- 4th
- B- 5th
- C- 6th
- D- 7th

Answer: D