

Lymphatic drainage of head and neck

Edited by: Batool B.

Lymph nodes of face and scalp

Five groups of lymph nodes *Notice how they're around the parotid*

Pre-auricular/parotid nodes

Ordered anterior to posterior:

1- Submental nodes

2- Submandibular nodes

3- Pre-auricular/ parotid nodes

4- Mastoid/ Post-auricular nodes

5- Occipital nodes

They form a ring around the base of the head

There's no lymphatic drainage above the level of this ring

Submental nodes

Submandibular nodes

Omohyoid muscle

Jugulo-omohyoid node

Occipital nodes

Mastoid nodes (Post auricular)

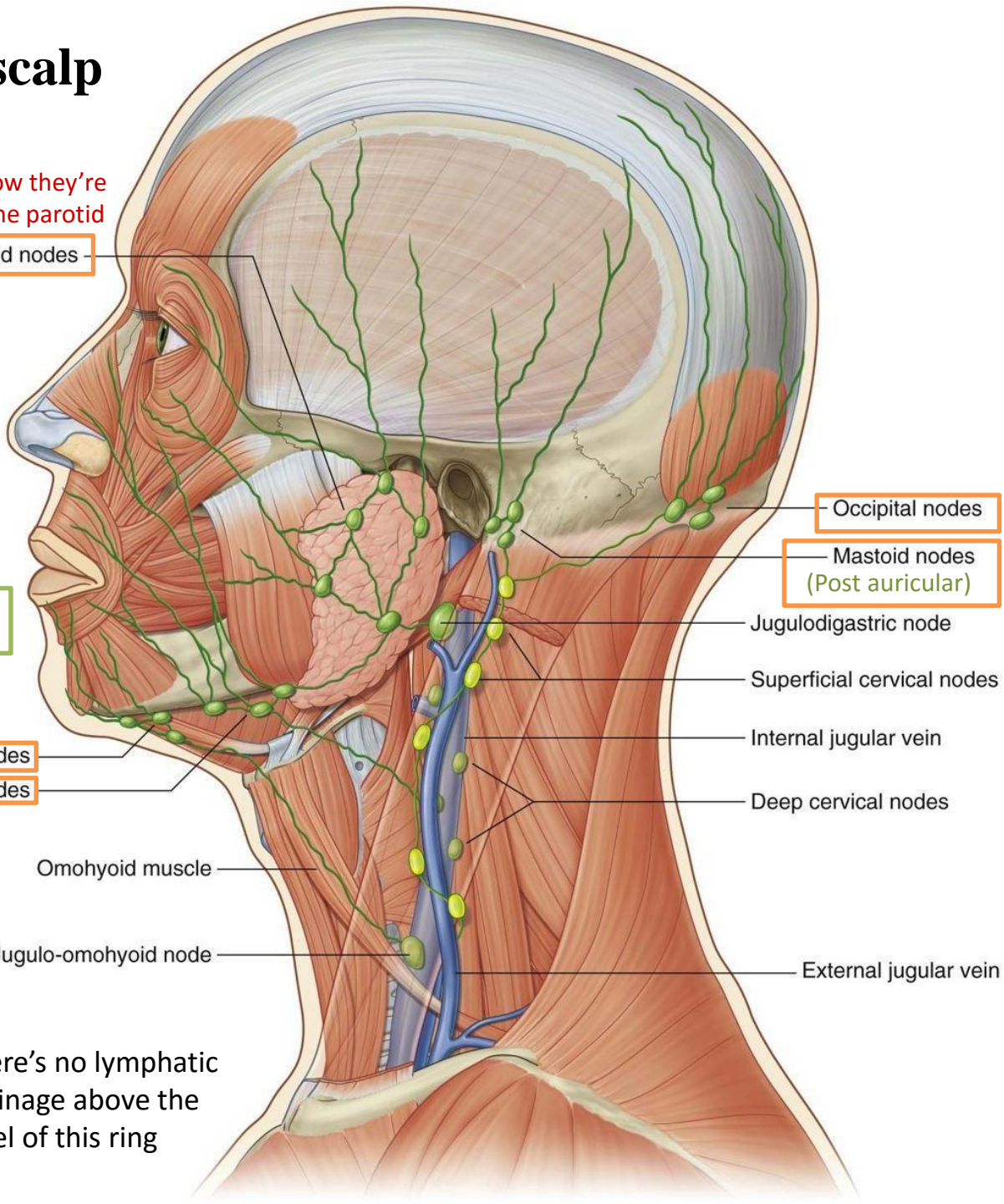
Jugulodigastric node

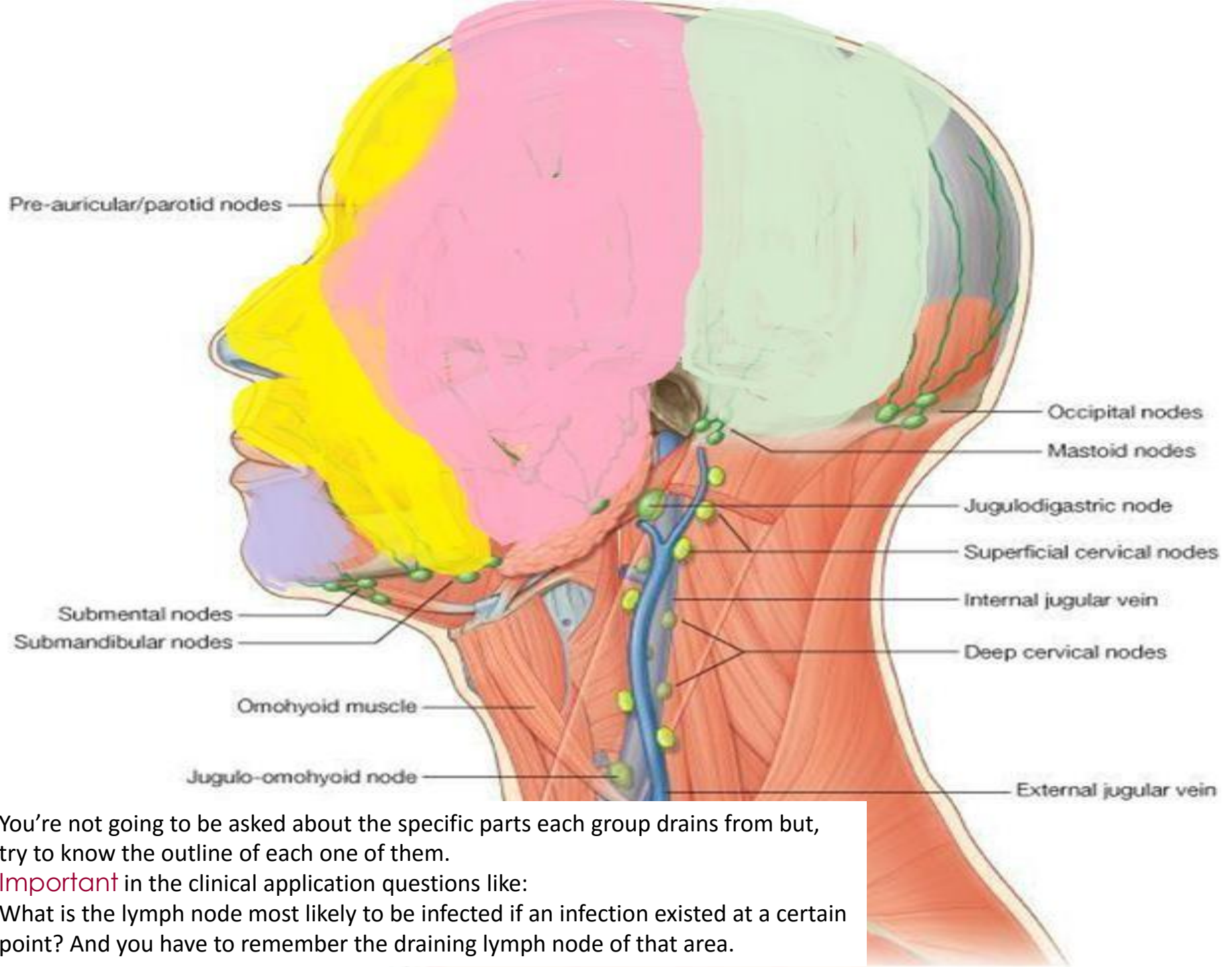
Superficial cervical nodes

Internal jugular vein

Deep cervical nodes

External jugular vein





You're not going to be asked about the specific parts each group drains from but, try to know the outline of each one of them.

Important in the clinical application questions like:

What is the lymph node most likely to be infected if an infection existed at a certain point? And you have to remember the draining lymph node of that area.

Draining site sites of each lymph node: Extra info*

Submental brings Drainage from: lower lip, lower teeth, tip of the tongue, lower gingiva, anterior part of the floor of the mouth

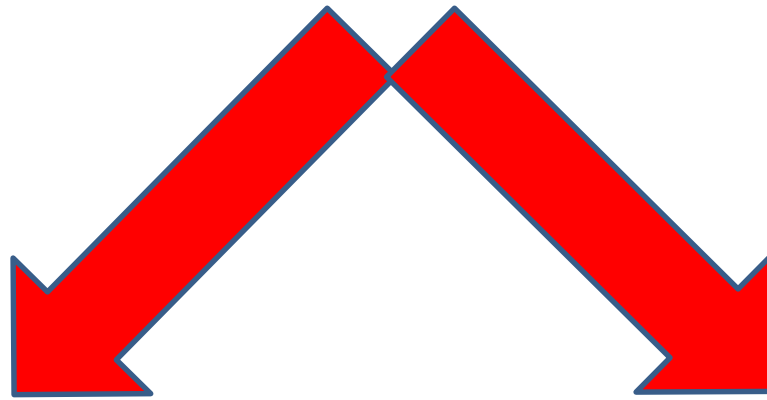
Submandibular: completes draining the lower lip, the upper lip, side of the nose, medial side of the eye, anterior part of the forehead

Pre-auricular/ parotid: the rest of the cheek, the upper and lower eyelids, from the anterior part of the auricle, anterior half of the scalp

Post-auricular/ mastoid: posterior part of the auricle, middle posterior part of the scalp, lateral part of the scalp

Occipital: most posterior part of the scalp

Lymph nodes of the neck



Superficial group

*exist in the superficial
fascia

Deep group

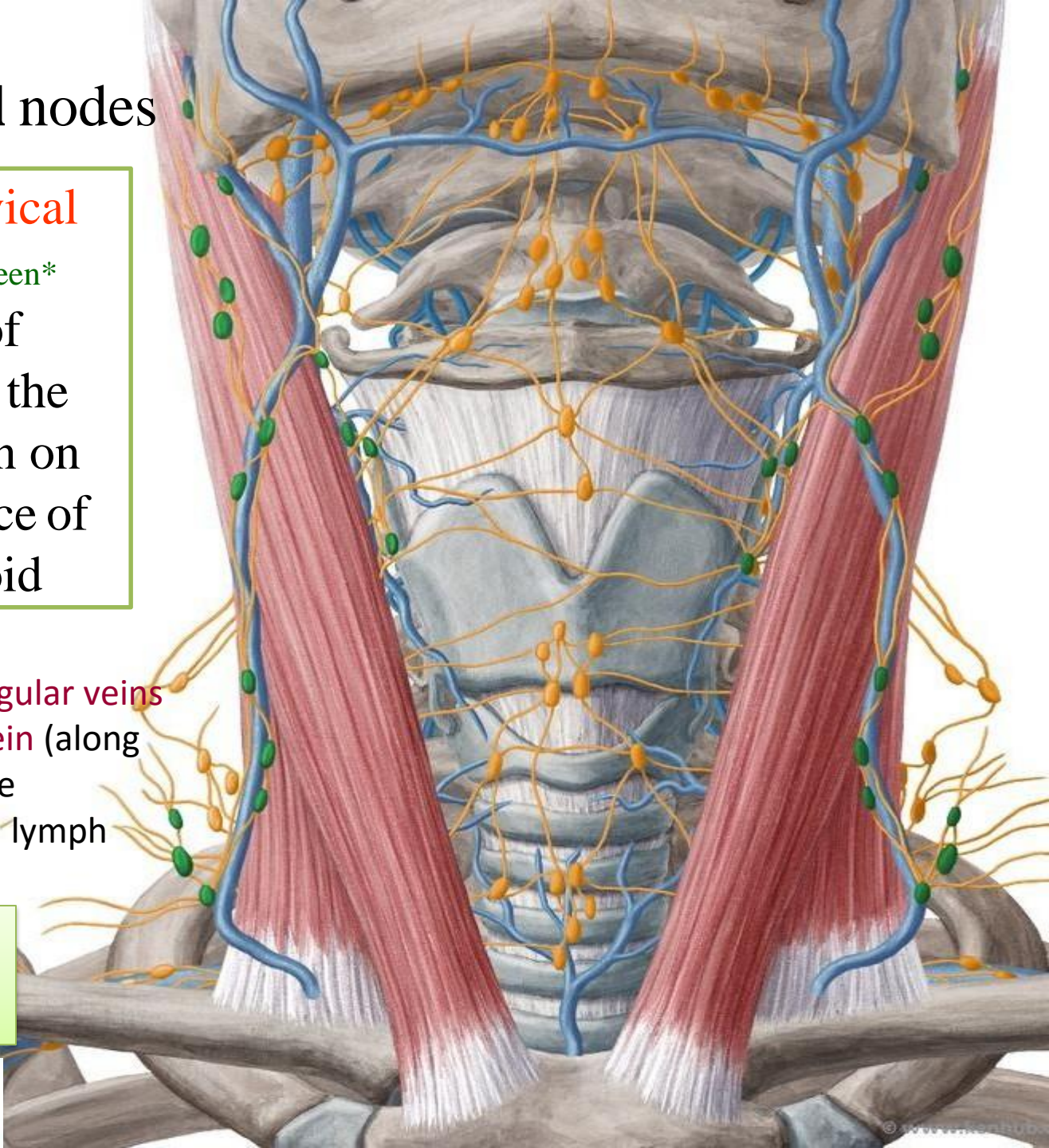
* Deep to the deep
fascia

Superficial cervical nodes

The **superficial cervical nodes** *highlighted in green* are a collection of lymph nodes along the external jugular vein on the superficial surface of sternocleidomastoid

- Superficial veins:
- lateral external jugular veins
 - Anterior jugular vein (along its course are some superficial cervical lymph nodes)

Vertical along superficial veins



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Course of the anterior jugular vein:

It starts with the submental veins, they form 2 anterior jugular veins, which run in a vertical direction in the superficial anterior part of the neck.

Just above the supra sternal notch they communicate forming the jugular arch, then they separate, each one going laterally to pierce the deep fascia becoming deep to eventually drain into deeper veins.

Deep cervical nodes

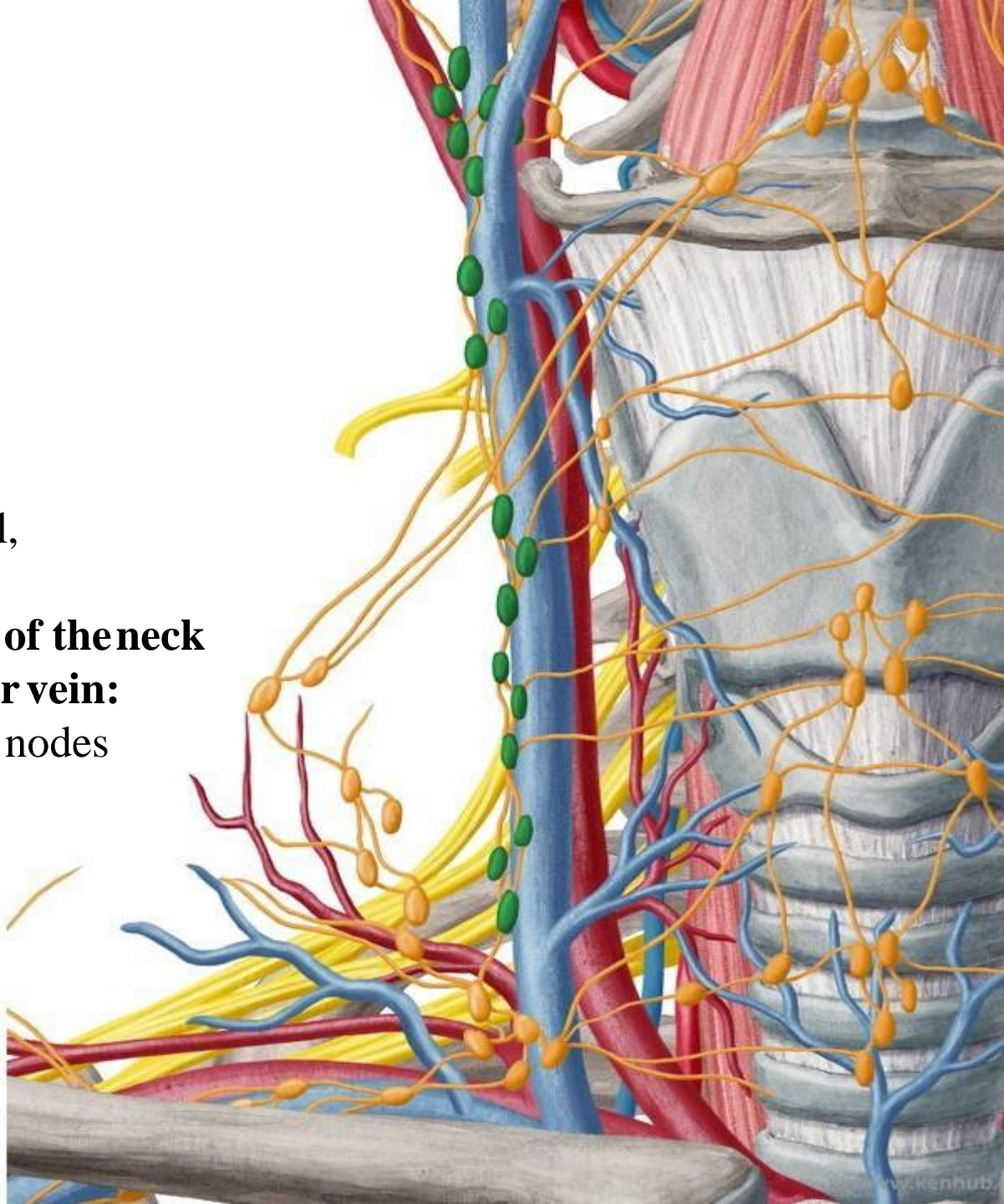
Deep Cervical Lymph nodes are divided into 2 groups:

1- Median group:

-Retropharyngeal, prelaryngeal, pretracheal and paratracheal

2- Lateral group: At the side of the neck related to the internal jugular vein:

- Upper & lower deep cervical nodes



Median group of deep cervical lymph nodes (deep)

They're named according to the related structures

Supra hyoid lymph nodes

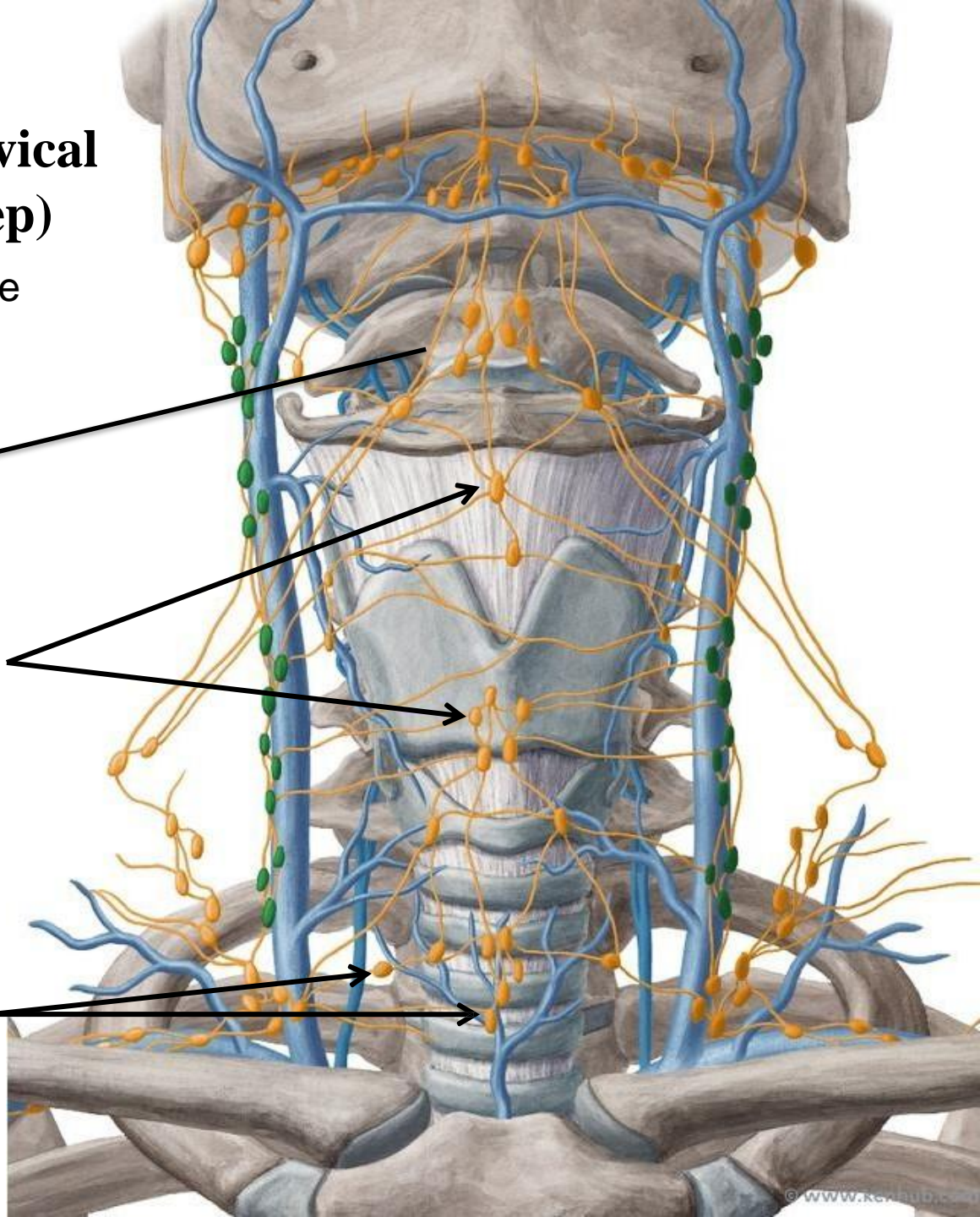
Located anterior to the larynx

Prelaryngeal lymph nodes

Located anterior to the trachea

Pretracheal and paratracheal lymph nodes

At the sides of trachea



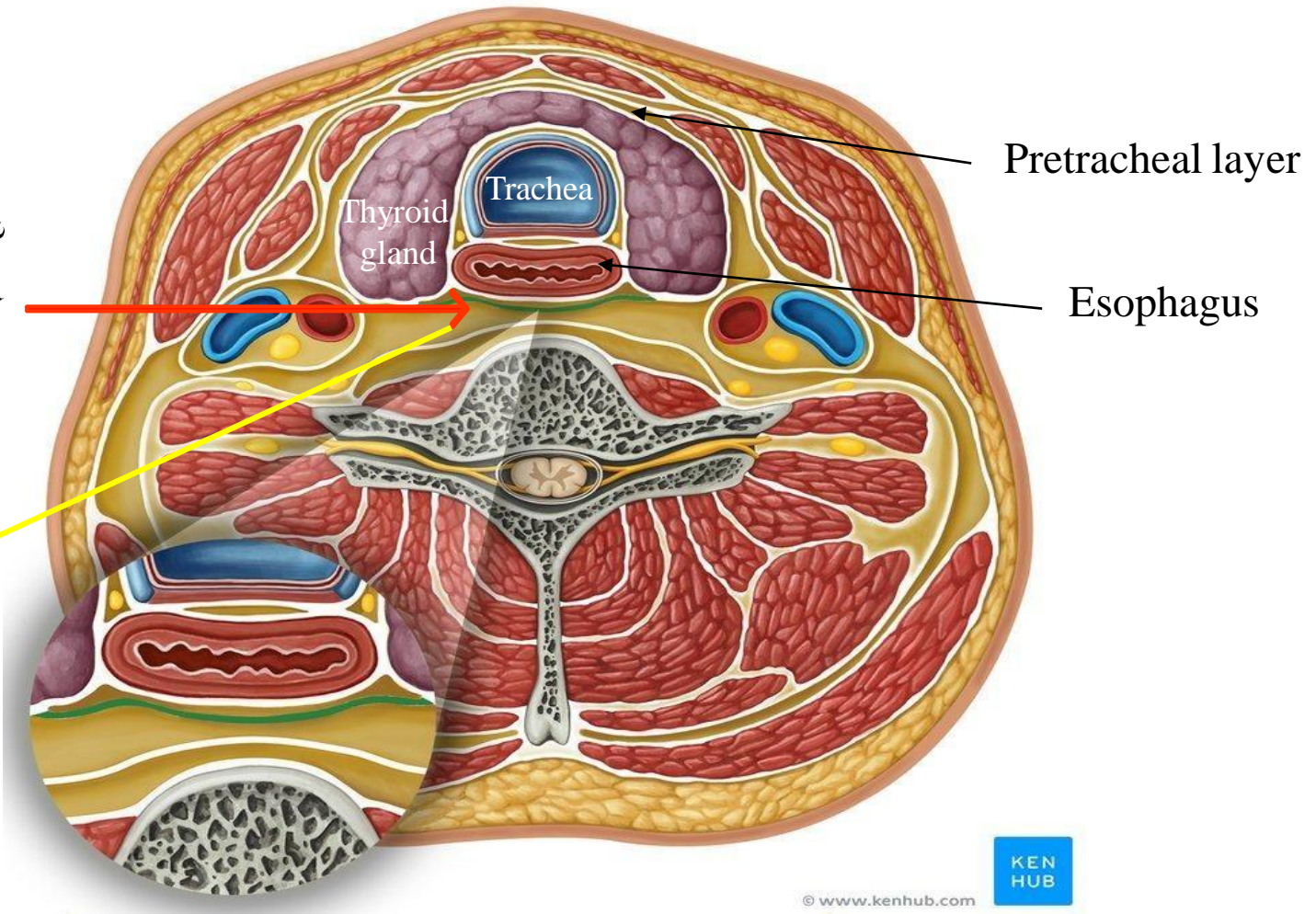
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Anterior

Pretracheal layer posterior to the pharynx is called **Buccopharyngeal fascia**

The **retropharyngeal space** is a potential space of the head and neck, bounded by the buccopharyngeal fascia

In between the pre-tracheal and pre vertebral layers of deep fascia



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Another lymph node located deep in the midline **posteriorly** called **retropharyngeal lymph nodes**

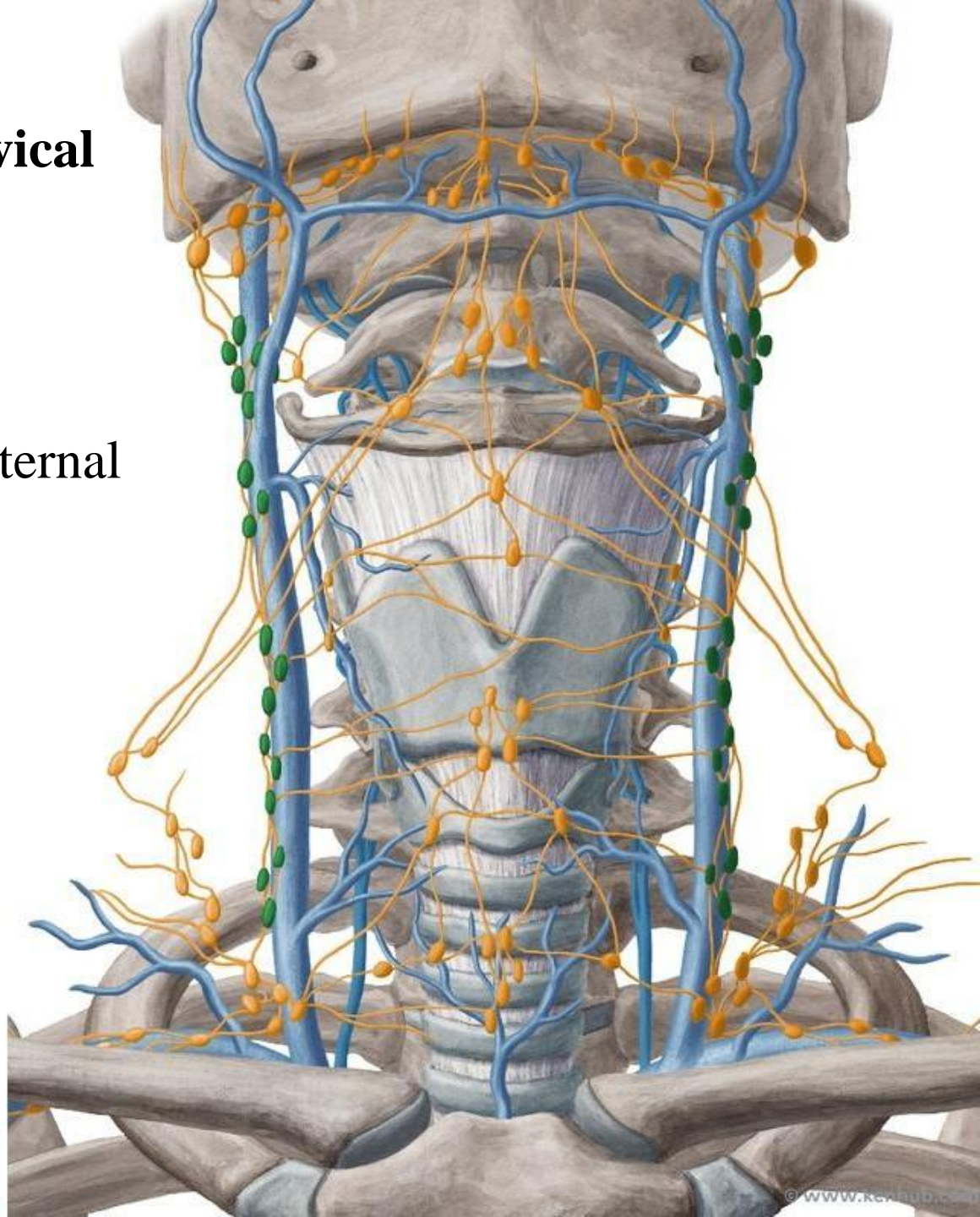
Posterior

Lateral group of deep cervical lymph nodes

At side of neck along internal jugular vein

Deep cervical nodes are
Part of the contents of the
carotid sheath

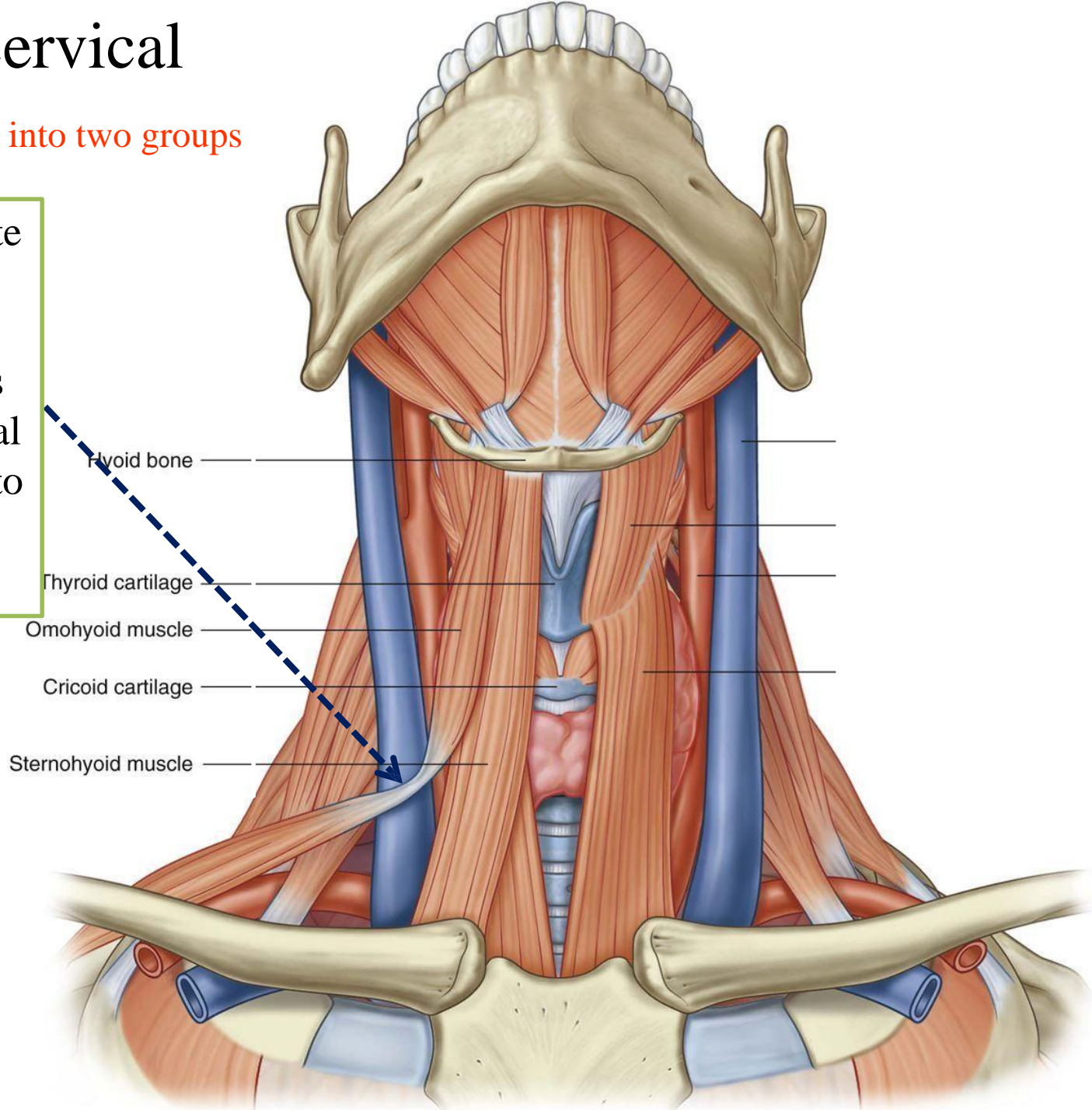
They're divided into two
group: upper and lower



Deep lateral cervical nodes → divided into two groups

The intermediate tendon of the omohyoid muscle divides the deep cervical lymph nodes into **upper and lower groups**

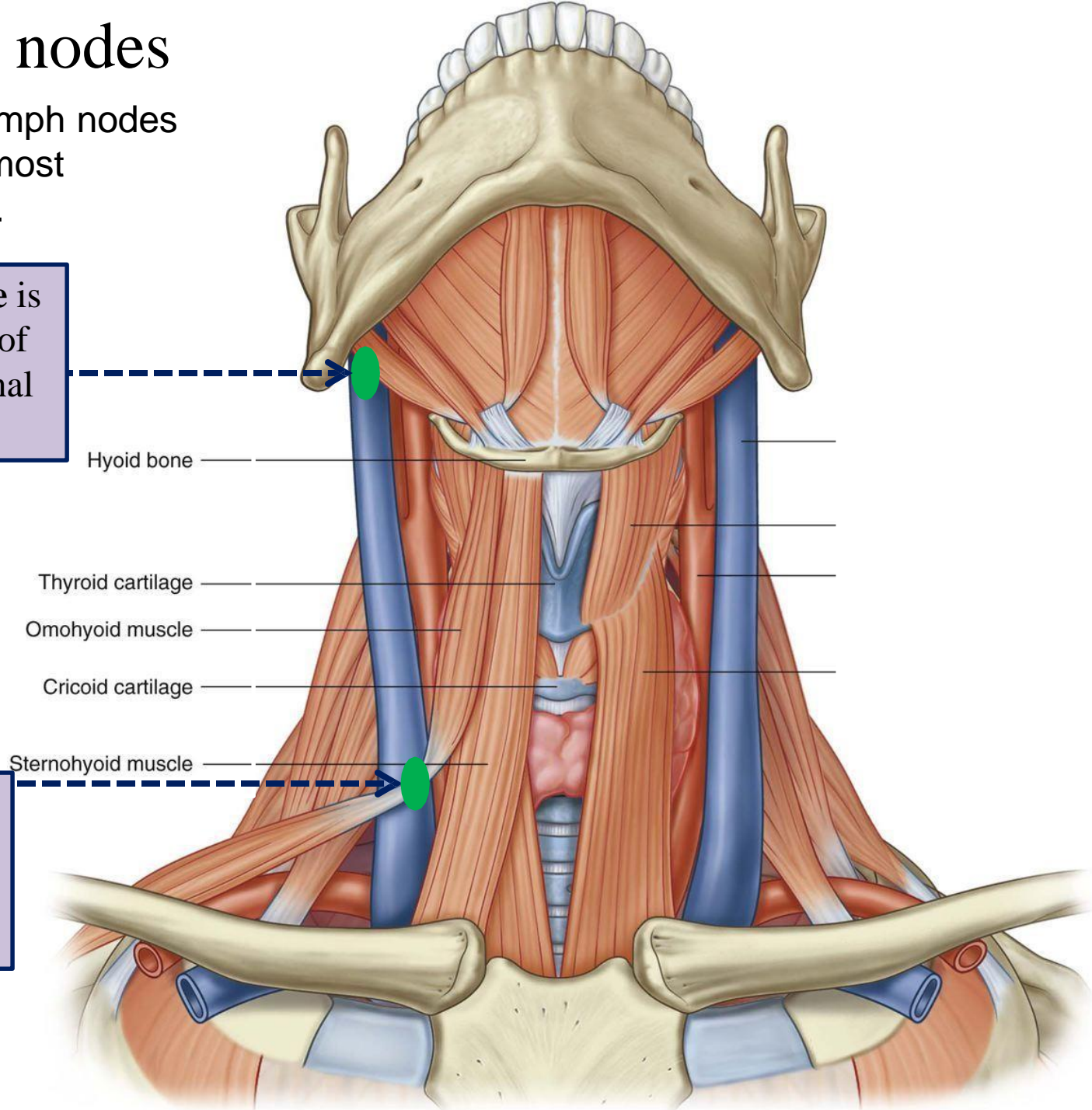
Remember the omohyoid muscle (one of the infrahyoids), the intermediate tendon of it passes anterior to the internal jugular vein, dividing the lateral deep lymph nodes.



Deep cervical nodes

- There are many lymph nodes but these are the most important clinically.

Jugulo-digastric Node is where posterior belly of digastric crosses internal jugular vein



Jugulo-omohyoid node is at or just inferior to the intermediate tendon of omohyoid

Deep cervical nodes along Internal jugular vein

Two important nodes in the deep cervical group

1 – Jugulo-digastric node

This large node is where posterior belly of digastric crosses the internal jugular vein and receives lymphatic drainage from the tonsils and tongue



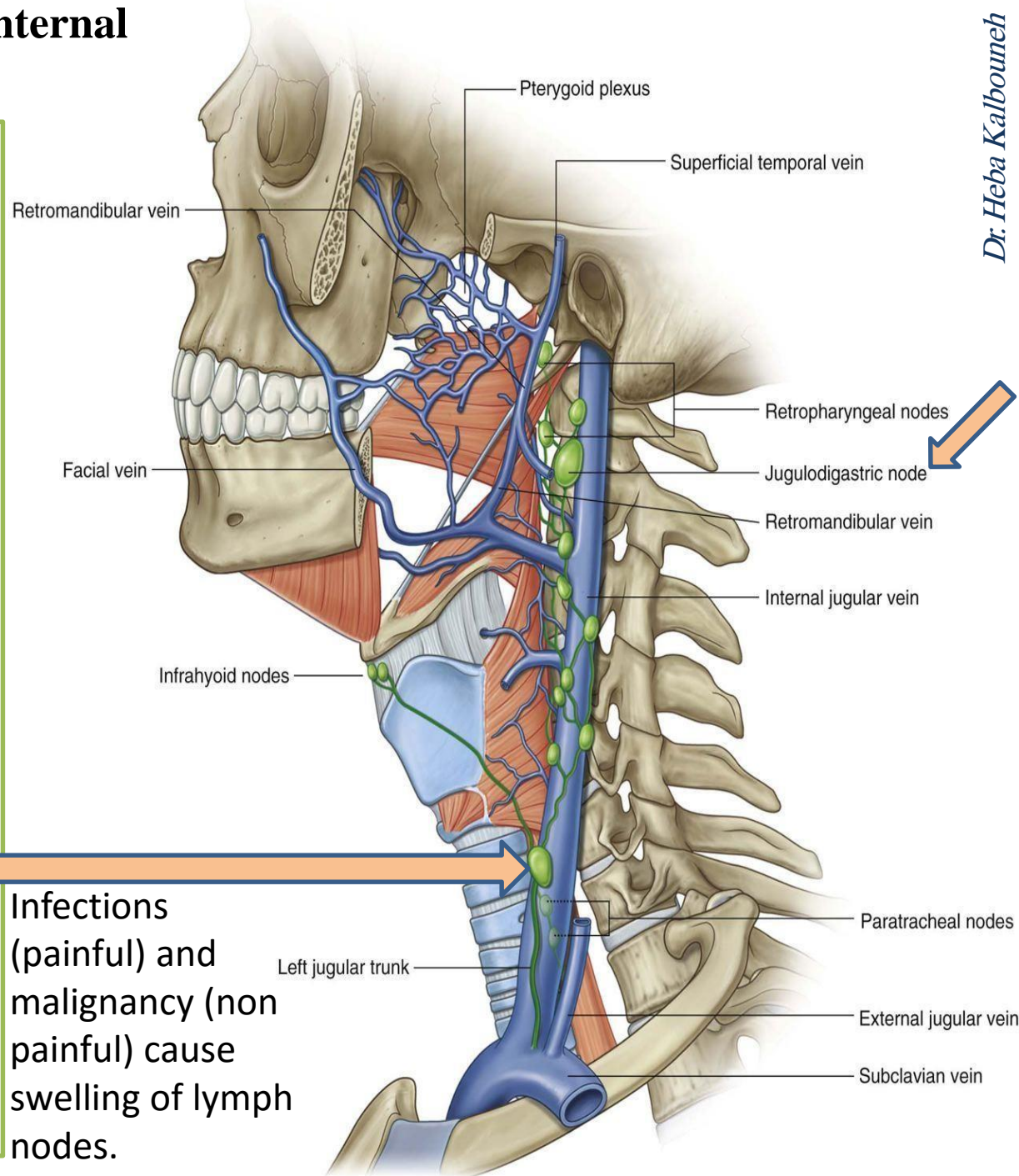
Enlarged jugulodigastric lymph nodes are commonly found in tonsillitis

2 - Jugulo-omohyoid node

it is at or just inferior to the intermediate tendon of omohyoid



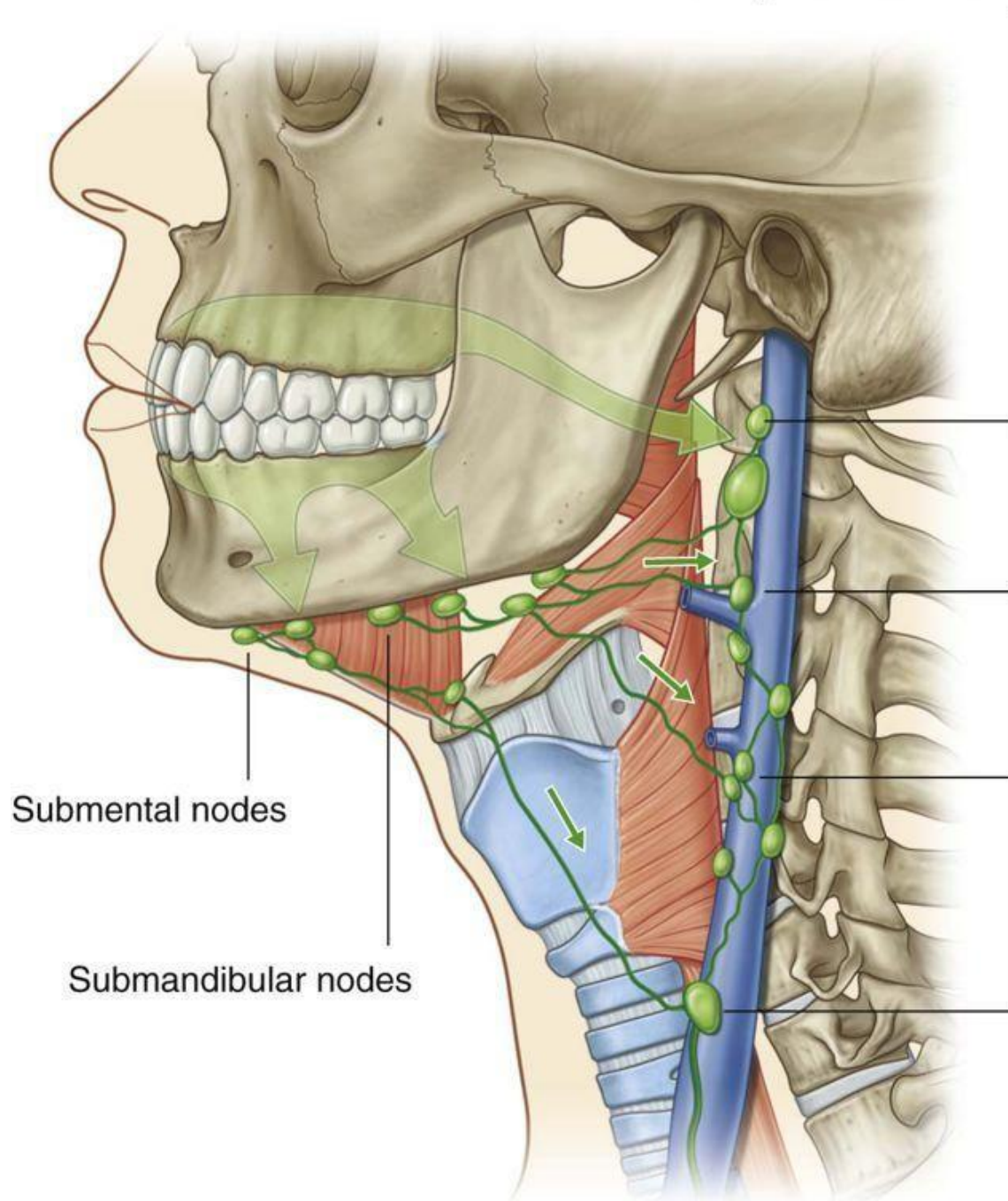
This node receives lymphatic drainage from the tongue



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Infections (painful) and malignancy (non painful) cause swelling of lymph nodes.

Deep cervical nodes



Fate of lymph drainage of head & neck

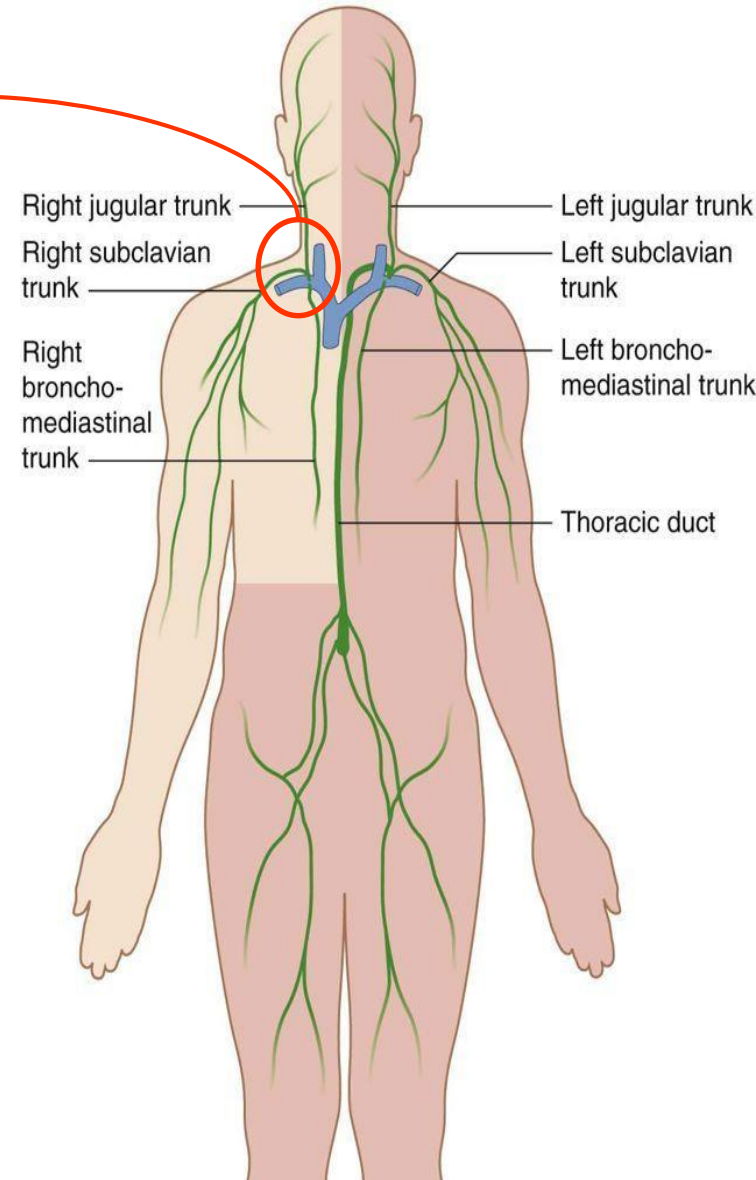
Venous angle is formed by the union of the internal jugular vein and the subclavian vein.

We mentioned before the thoracic duct that brings lymphatic drainage from the lower part of the body. It has to pierce the diaphragm to enter the thorax and drain back into the venous blood. Where exactly?

At the venous angle

The thoracic duct (other name: left lymphatic duct) pierces the diaphragm to drain into the left venous angle.

Venous
angle



Drainage from the head and neck:

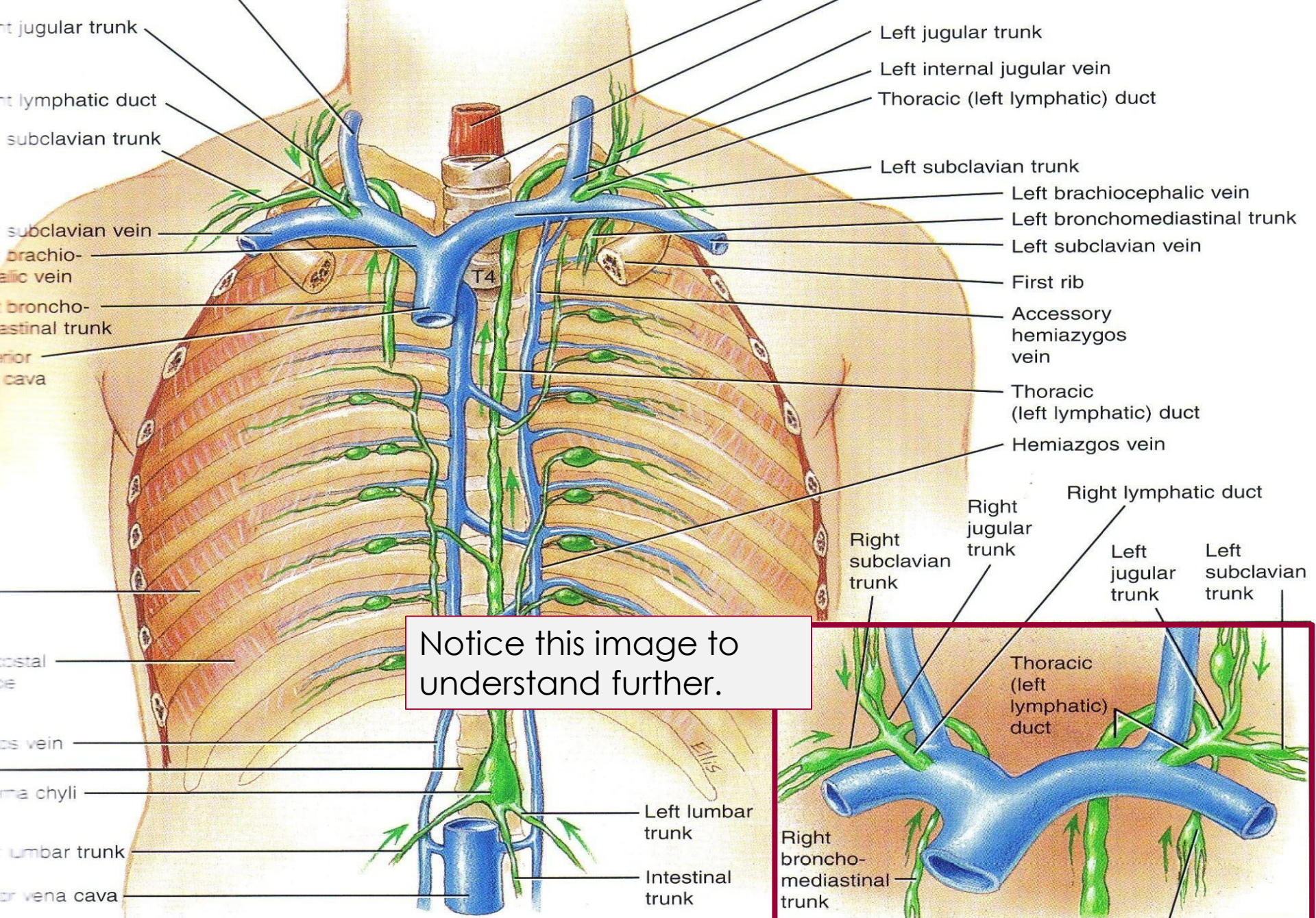
All the lymphatic drainage of the head (the ring) will go into the **upper deep cervical lymph nodes**

The **upper deep cervical** drains into the **lower deep cervical**.

Superficial cervical drain directly into the **lower deep cervical**.

Then two lymphatic trunks will be formed, right and left jugular lymphatic trunks.
On the right side: The subclavian trunk (drainage of the upper limb) unites with the right jugular trunk to form a duct called the **right lymphatic duct** (drains: right side of head, right side of the neck, right side of the thorax and the upper limb) which drains into the **right venous angle**

The rest of the body is eventually drained by the thoracic duct (left lymphatic duct)
On the left side, same scenario, left jugular trunk with left subclavian drain directly into the left lymphatic duct which drains into the left venous angle.

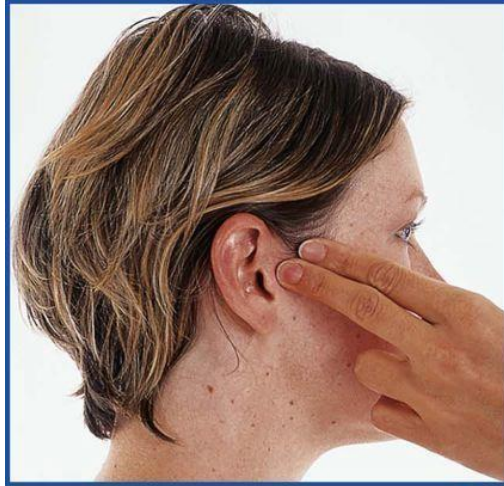


Overall anterior view

Detailed anterior view

Left bronchomediastinal trunk

Root of the zygomatic arch, anterior to the auricle



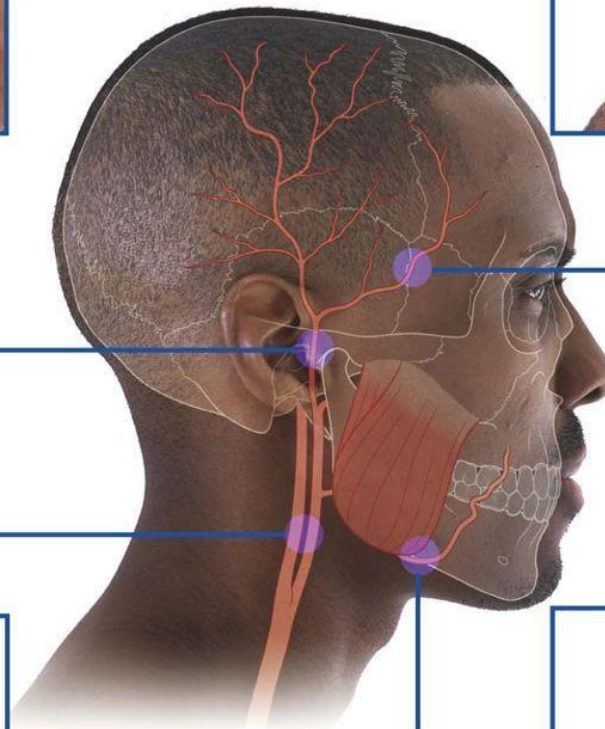
Temporal pulse (superficial temporal artery)

Anterior in the temple area.



Temporal pulse (anterior branch of superficial temporal artery)

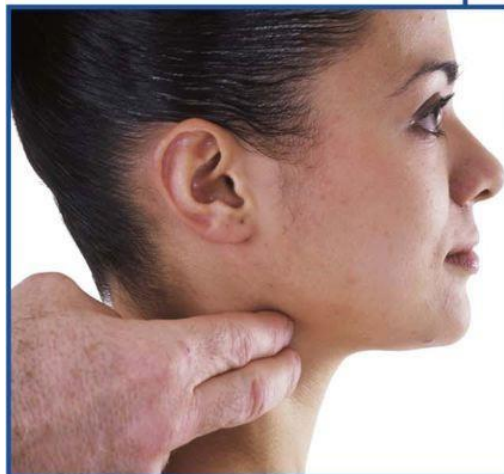
Pulse points
Where to take arterial pulses in the head and neck



Carotid pulse

Facial pulse

Easiest to feel



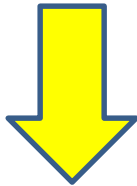
Facial artery, as it crosses the mandible, anterior to the masseter muscle
Ask patient to clench his teeth .



Carotid pulse

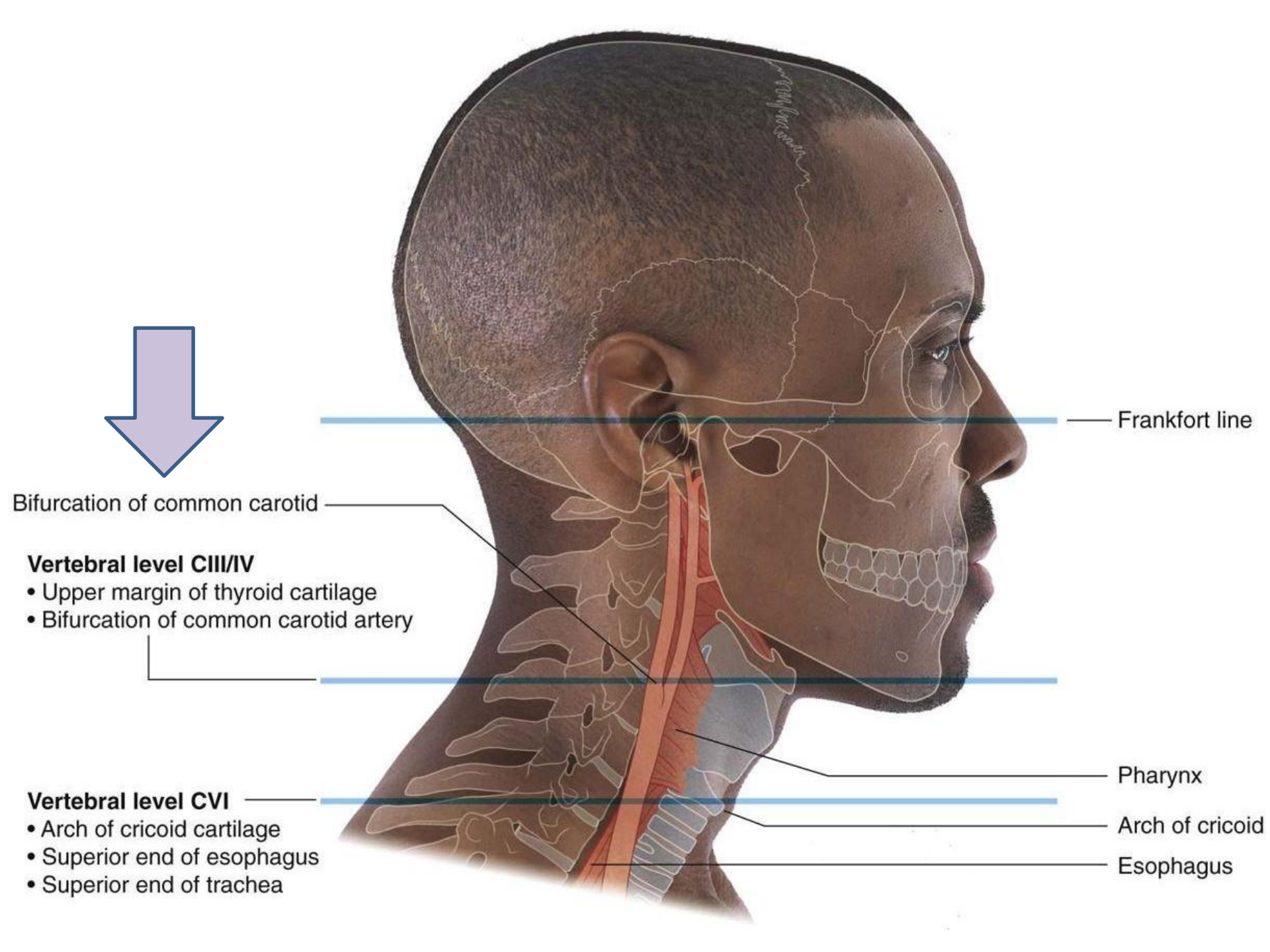
The carotid pulse is the strongest

To check *carotid pulse*



Place your index and middle fingers on the neck to the side of larynx (in carotid triangle), under the angle of the mandible
We can't say it's common or internal or external here





Frankfort line

Bifurcation of common carotid

Vertebral level CIII/IV

- Upper margin of thyroid cartilage
- Bifurcation of common carotid artery

Vertebral level CVI

- Arch of cricoid cartilage
- Superior end of esophagus
- Superior end of trachea

Pharynx

Arch of cricoid

Esophagus

Contents of the posterior triangle

5 Veins:

1. External jugular vein
2. Anterior jugular vein
3. Transverse cervical vein
4. Suprascapular vein
5. *Subclavian vein*

4 Arteries:

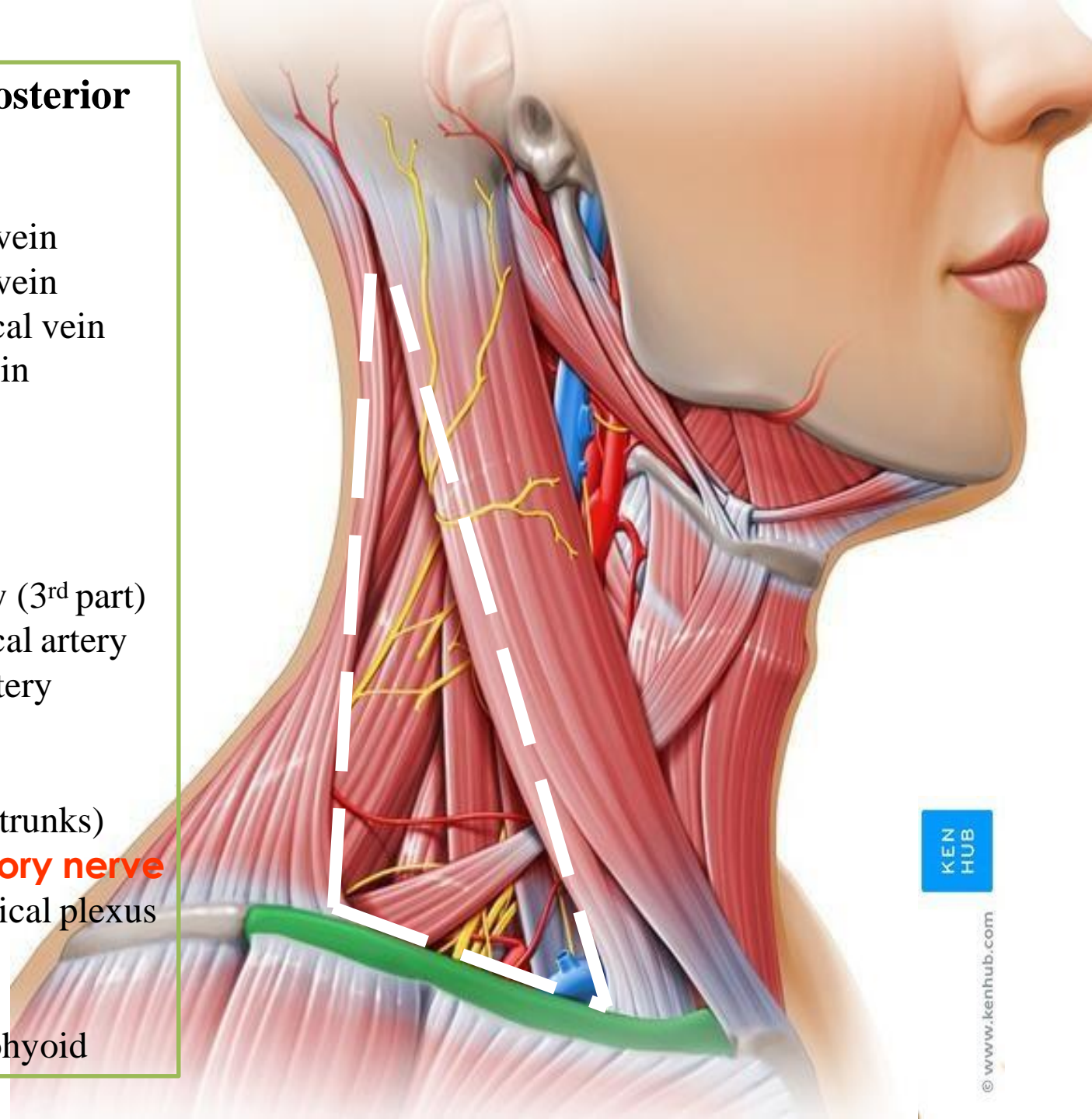
1. Occipital artery
2. Subclavian artery (3rd part)
3. Transverse cervical artery
4. Suprascapular artery

3 Nerves

1. Brachial plexus (trunks)
2. **Spinal Accessory nerve**
3. Branches of cervical plexus

1 Muscle

Inferior belly of omohyoid



Spinal accessory nerve

Spinal accessory nerve is embedded in the **investing layer of deep fascia** (Which forms the **roof of the posterior triangle**), stretched between two muscles (SCM, and trapezius)

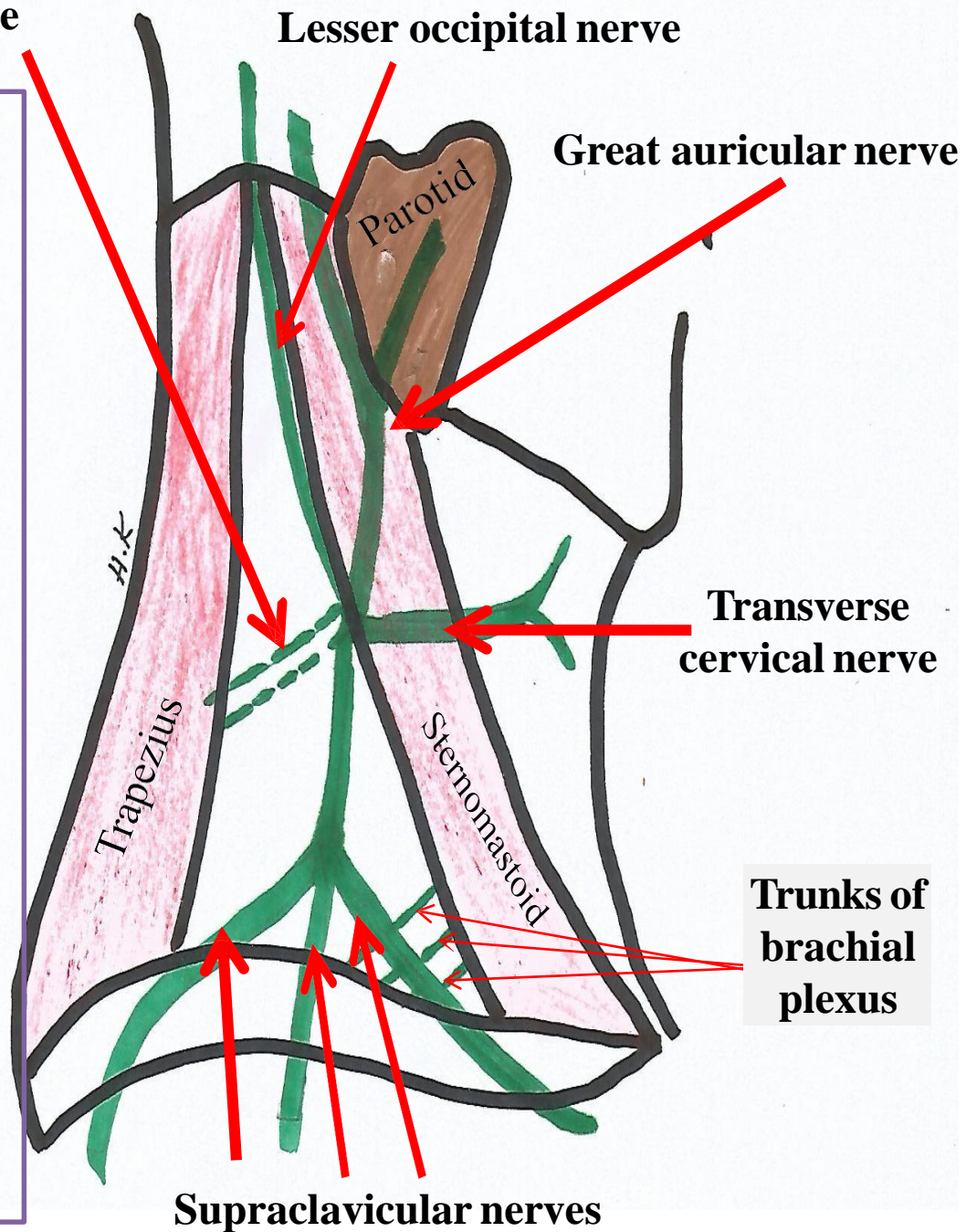
The accessory nerve after supplying trapezius will run inside the two layers of investing layer of deep fascia



The relatively **superficial location** of the spinal accessory nerve as it crosses the posterior cervical triangle makes it **susceptible to injury**

If we have blunt trauma, since the nerve is stretched between two contracting muscle, it'll be damaged.

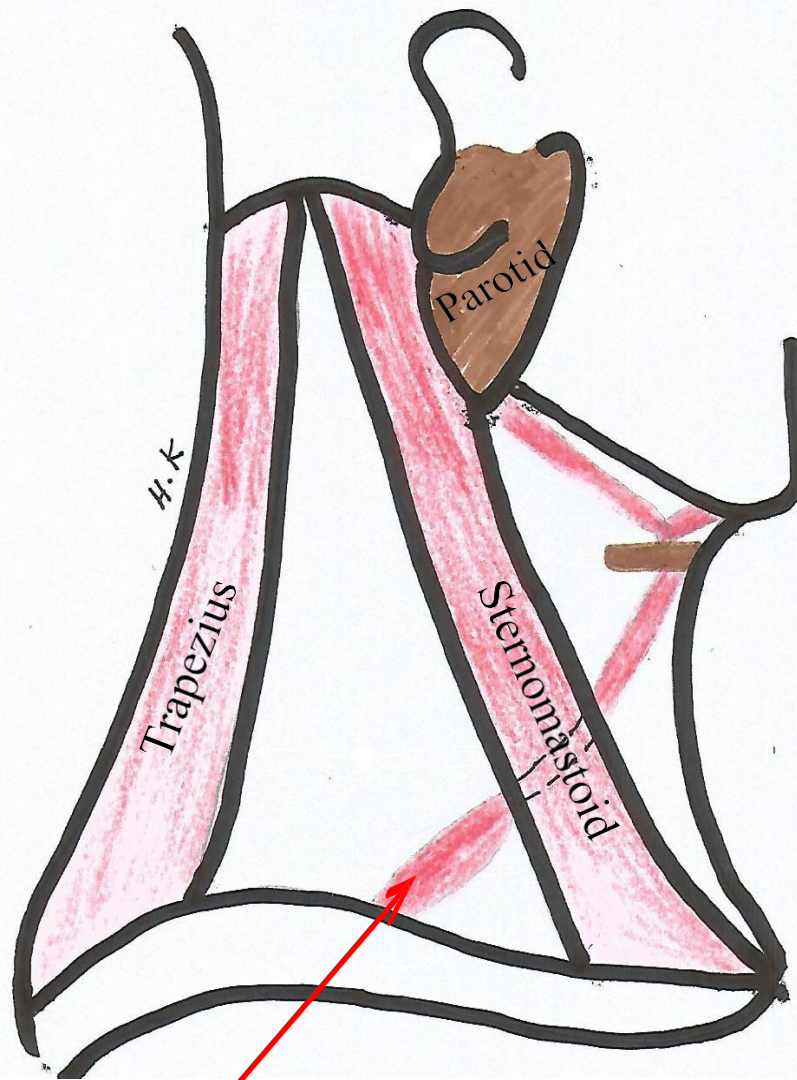
Sharp object, whatever the state of the nerve (taut, relaxed) would cause injury
Flaccid nerve + blunt trauma → nerve may escape injury



Why do we have the omohyoid here?

To understand this, see next slide briefly

In order for the external jugular vein to become deep it has to pierce the investing layer of deep fascia to drain into the subclavian. The opening of the external jugular is located inside this tense sheath. The tension of the sheath between trapezius and SCM, would cause closure of this opening. Omohyoid (embedded into this fascia) stretches this sheath downward when contracted to keep this opening open, to prevent impairment of this venous drainage.



Inferior belly of omohyoid

Structures piercing the roof of posterior triangle (investing layer of deep fascia)

Lesser occipital nerve (C2)

Roof (investing layer of deep cervical fascia)

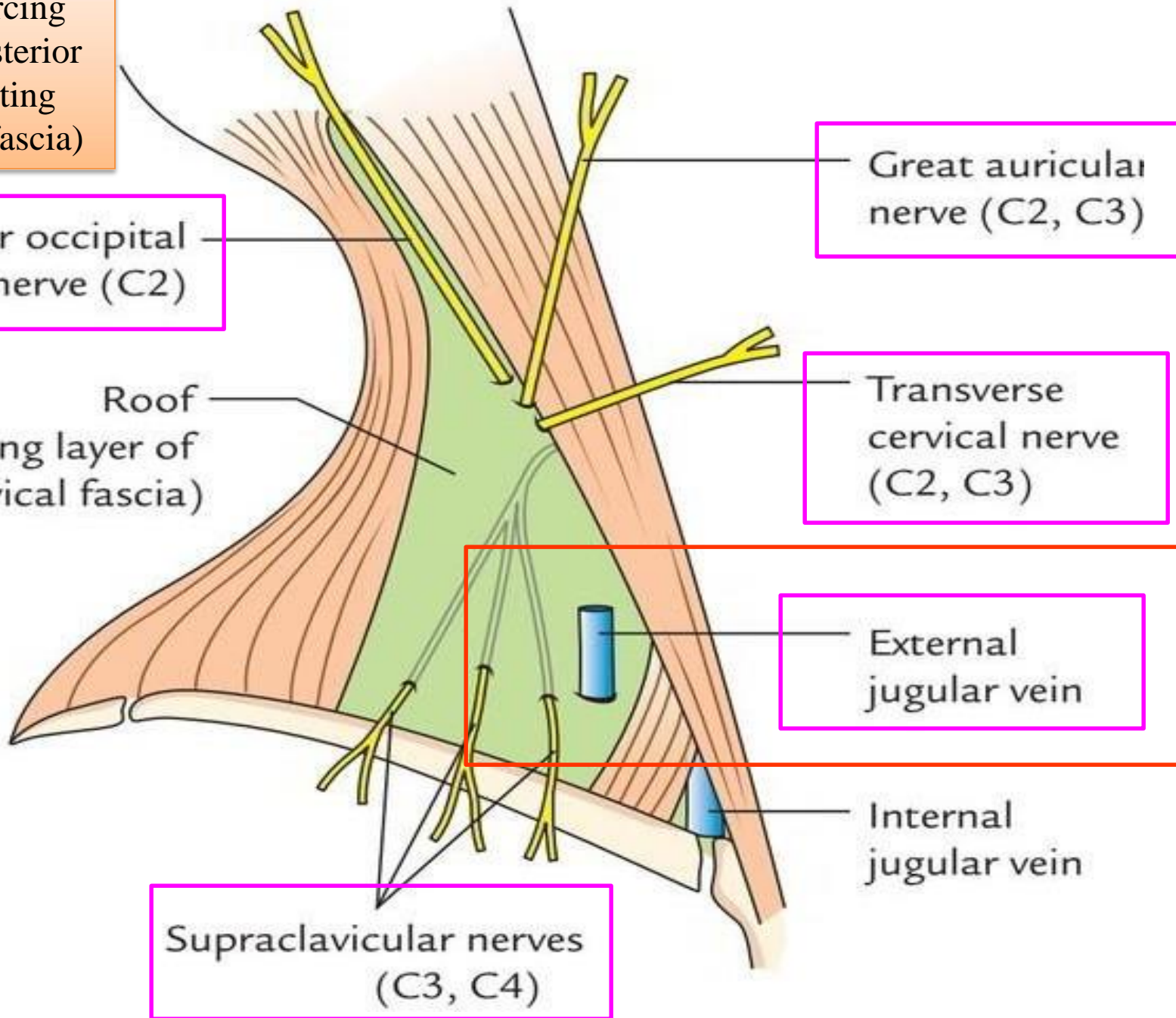
Great auricular nerve (C2, C3)

Transverse cervical nerve (C2, C3)

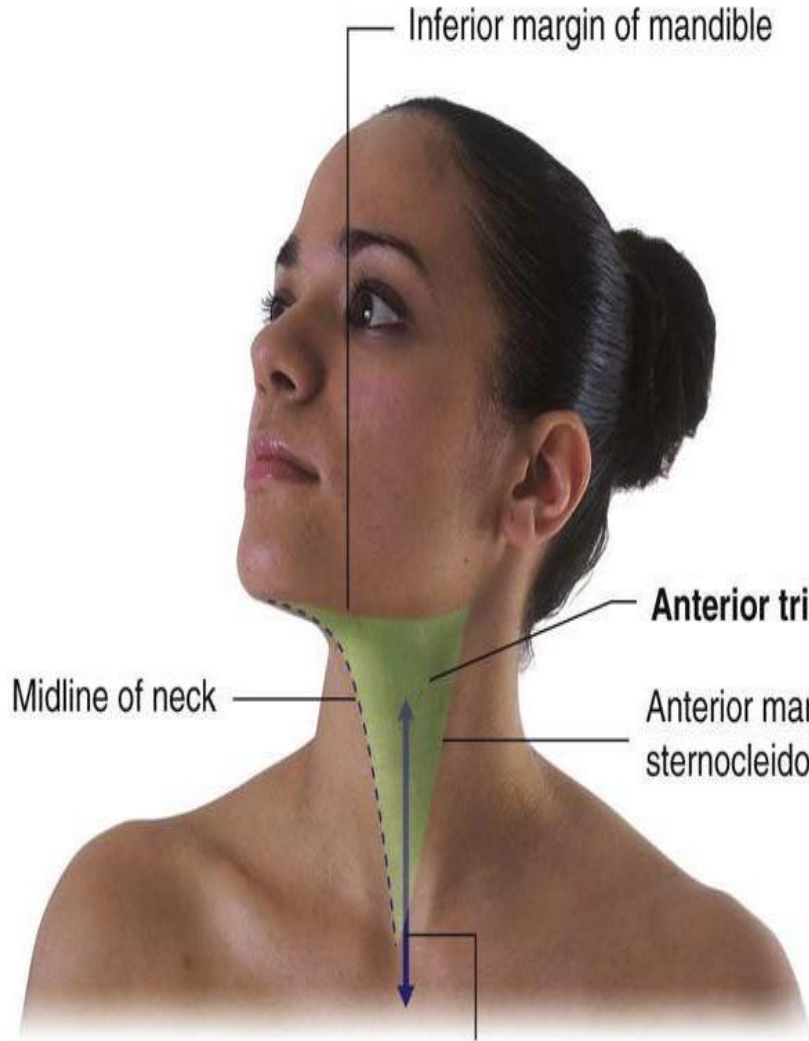
External jugular vein

Internal jugular vein

Supraclavicular nerves (C3, C4)



How to outline the anterior and posterior triangles of the neck



Midline of neck

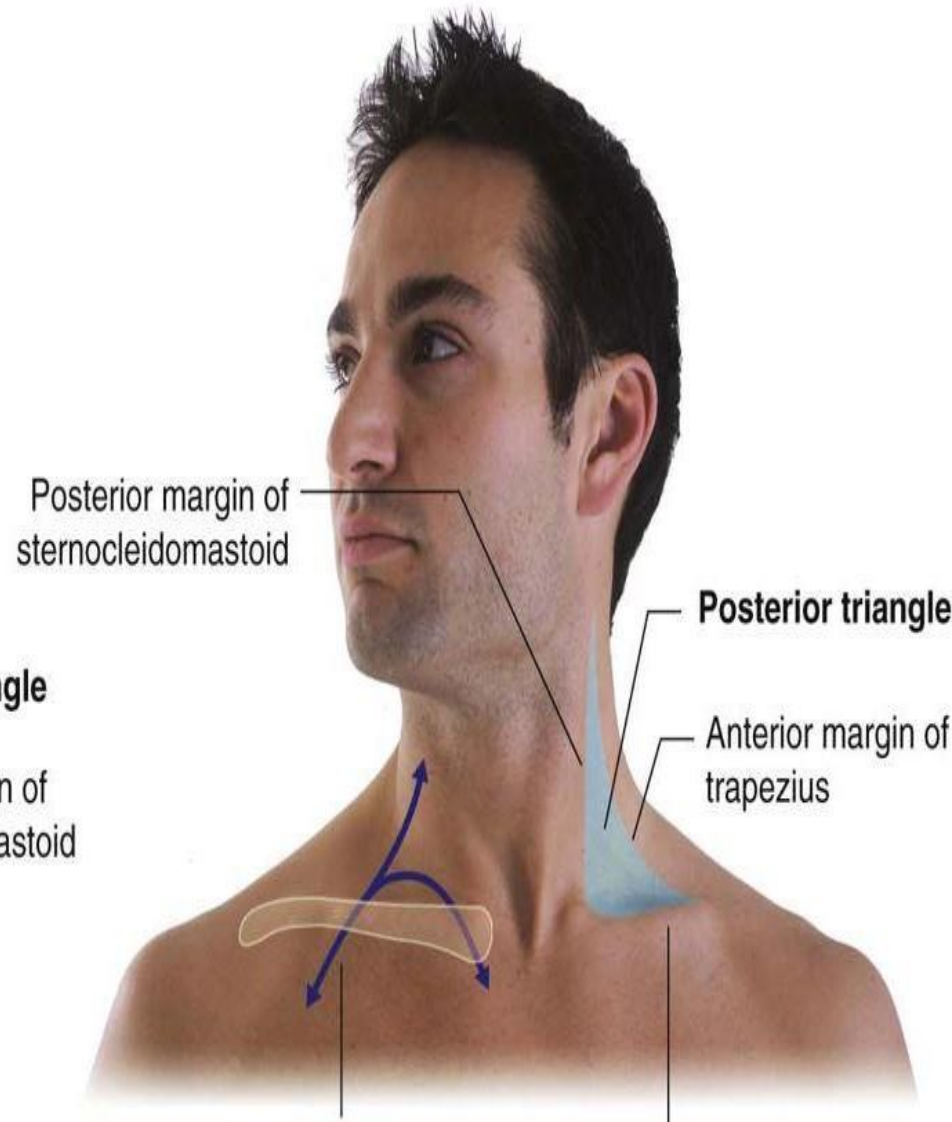
Inferior margin of mandible

Anterior triangle

Anterior margin of sternocleidomastoid

Structures coursing between head and thorax are associated with the anterior triangles

A



Posterior margin of sternocleidomastoid

Posterior triangle

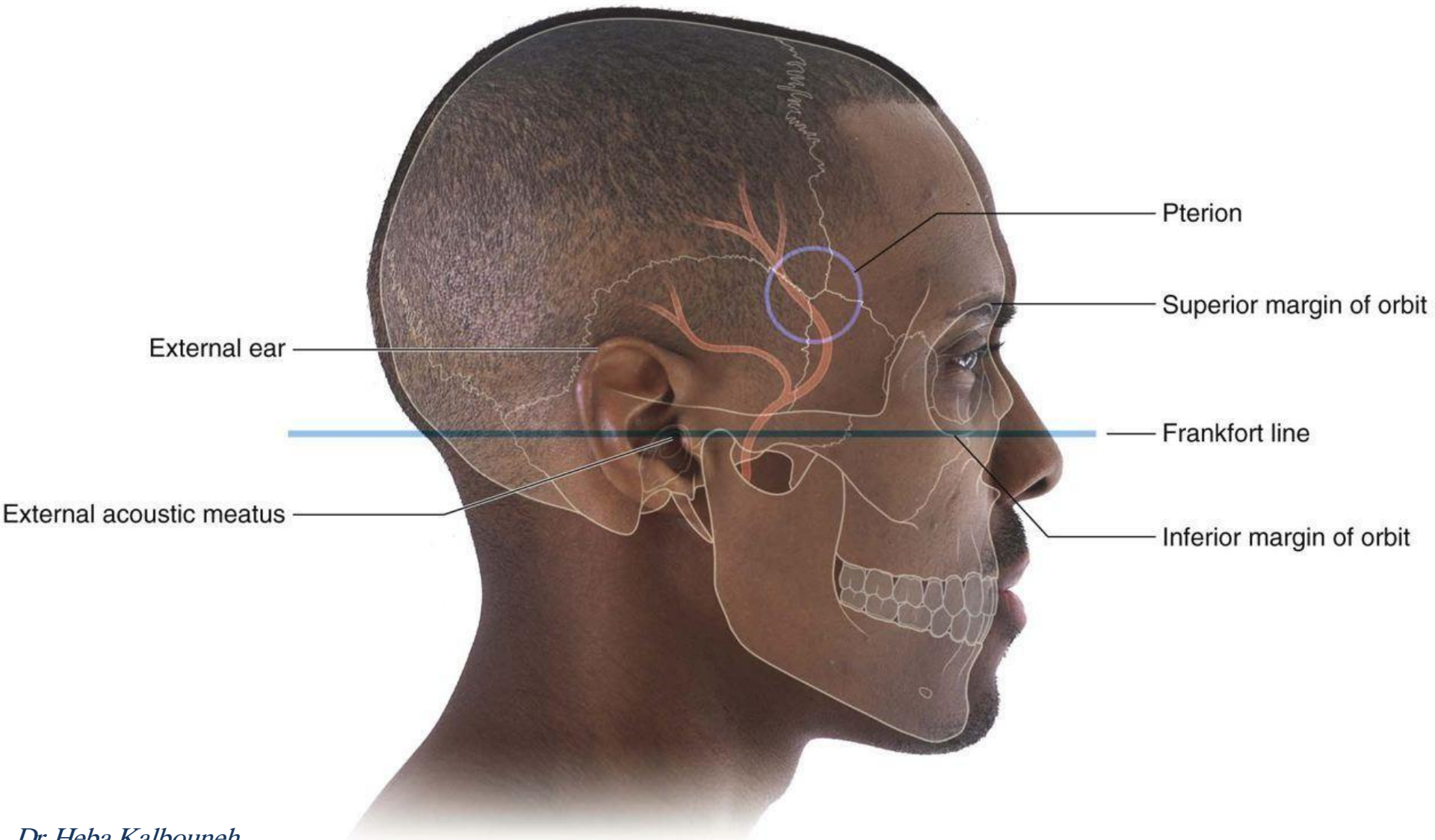
Anterior margin of trapezius

Clavicle

Structures coursing between thorax/neck and upper limb are associated with the posterior triangles

B

Estimating the position of the middle meningeal artery



Major features of the face

