

Anatomy of the scalp

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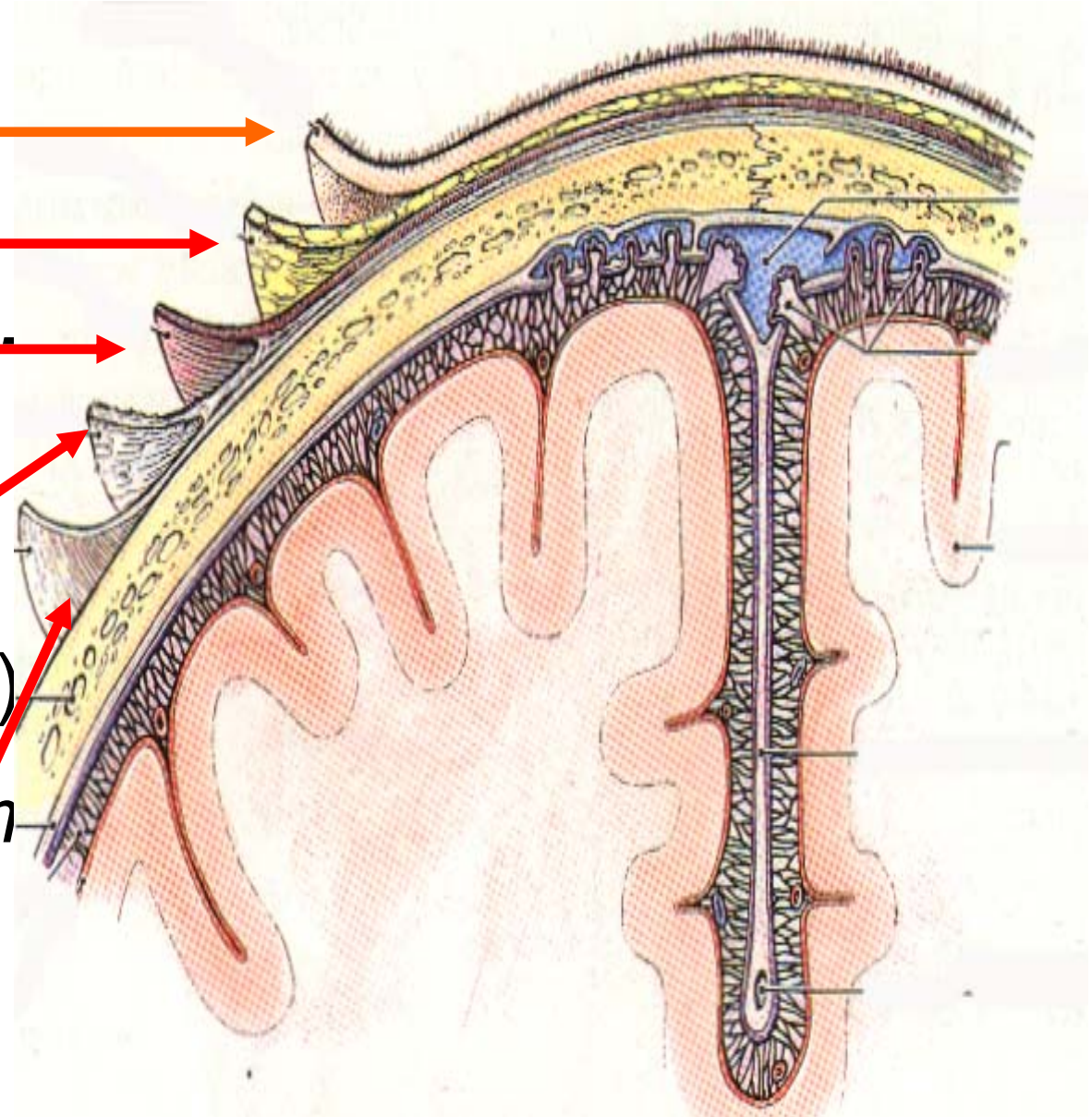
The Scalp

The soft tissue that covers the vault of skull

Extends from supraorbital margin to superior nuchal line

Layers of the scalp

- S** = skin
- C** = connective tissue
- A** = aponeurosis of occipito-
Frontalis
- L** = loose areolar C.T.
(subaponeurotic space)
- P** = pericranium (periosteum)



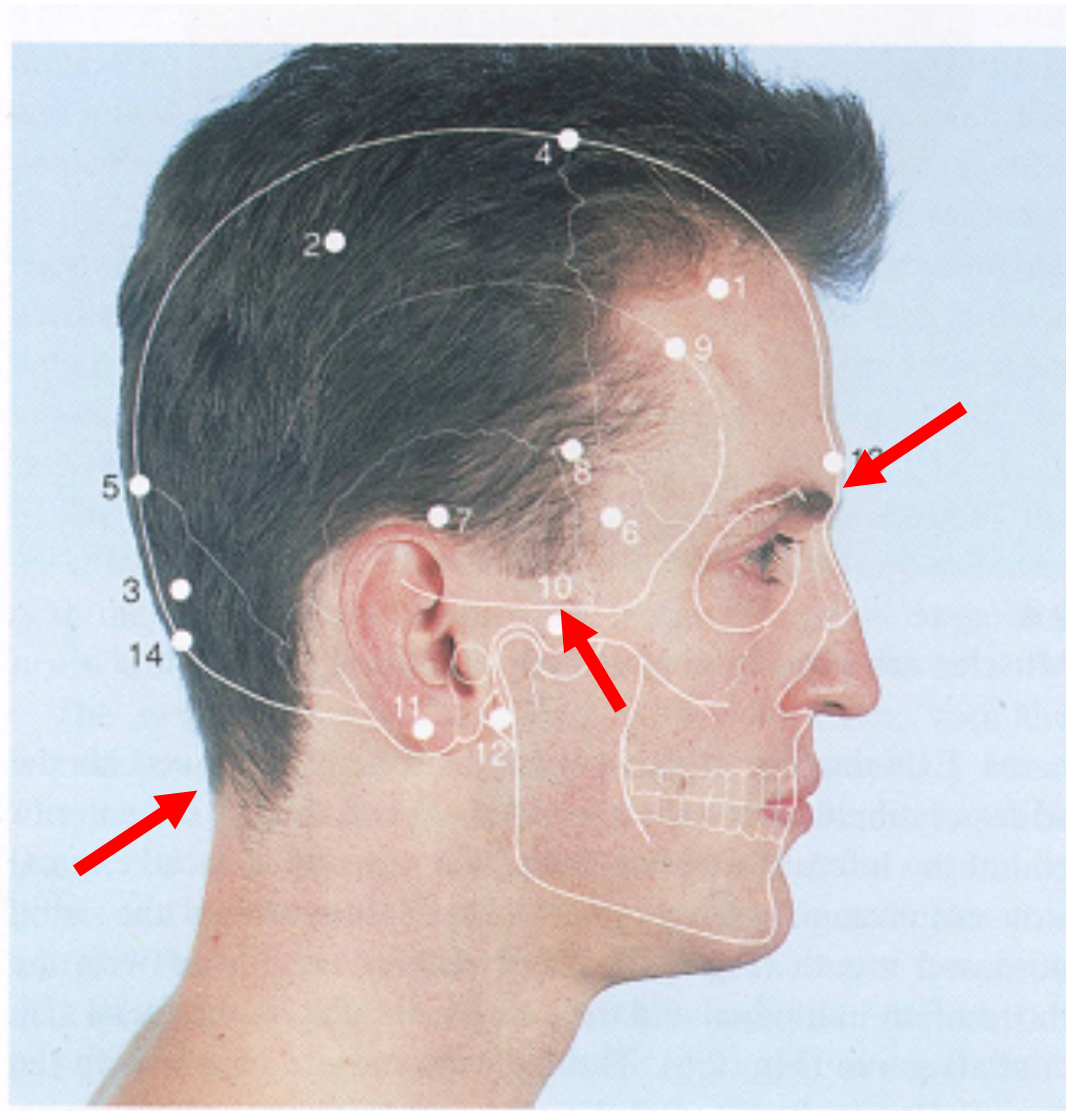
DEFINITION

The **scalp** consists of:

- **Skin** (normally hair-bearing) and
- **Subcutaneous tissue**
- it covers the calvaria

It extends:

- **Posteriorly**, from the **superior nuchal lines** of the occipital bone
- **Anteriorly**, from the **supraorbital margin** of the frontal bone
- **Laterally**, over the temporal fascia, to the zygomatic arches

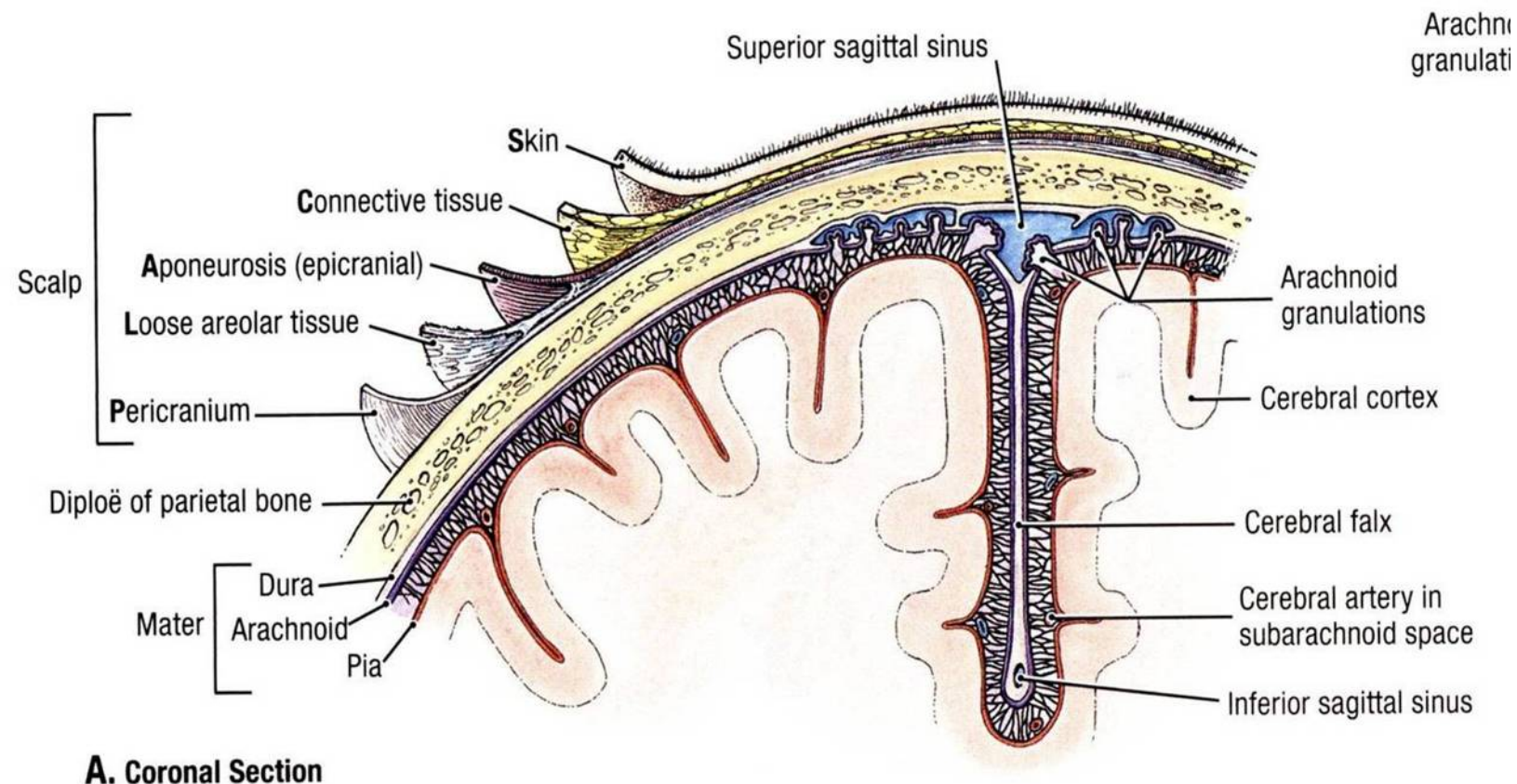


2.8

Lateral aspect of the head: bones

- | | |
|---------------------------------|---------------------|
| 1 Frontal | 7 Squamous temporal |
| 2 Parietal | 8 Pterion |
| 3 Occipital | 9 Temporal line |
| 4 Bregma (anterior fontanelle) | 10 Zygomatic arch |
| 5 Lambda (posterior fontanelle) | 11 Mastoid process |
| 6 Greater wing of sphenoid | 12 Styloid process |
| | 13 Glabella |
| | 14 Inion |

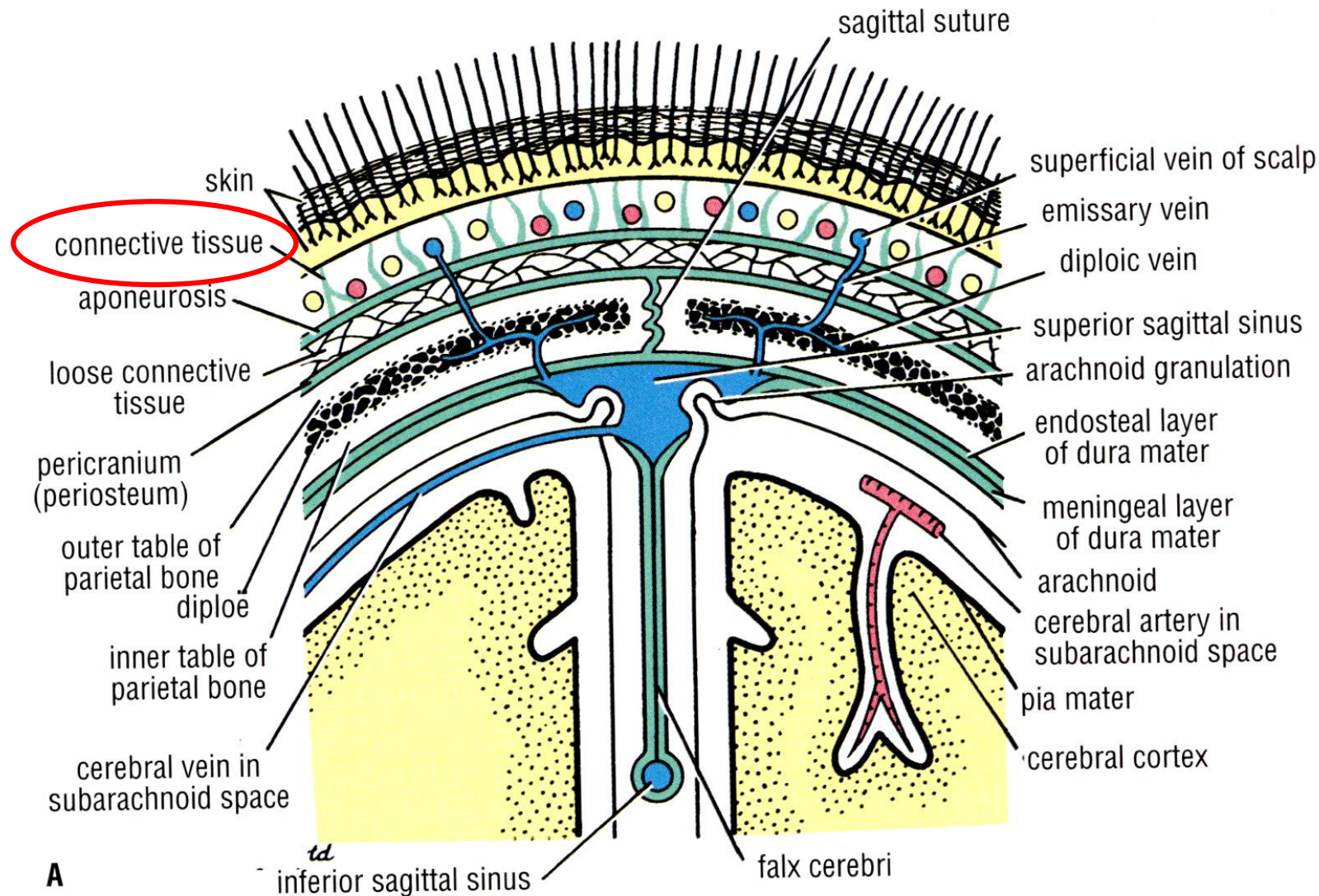
STRUCTURE



The **SCALP** consists of five layers:

- **S**kin
- **C**onnective tissue
- **A**poneurosis
- **L**oose areolar tissue
- **P**ericranium

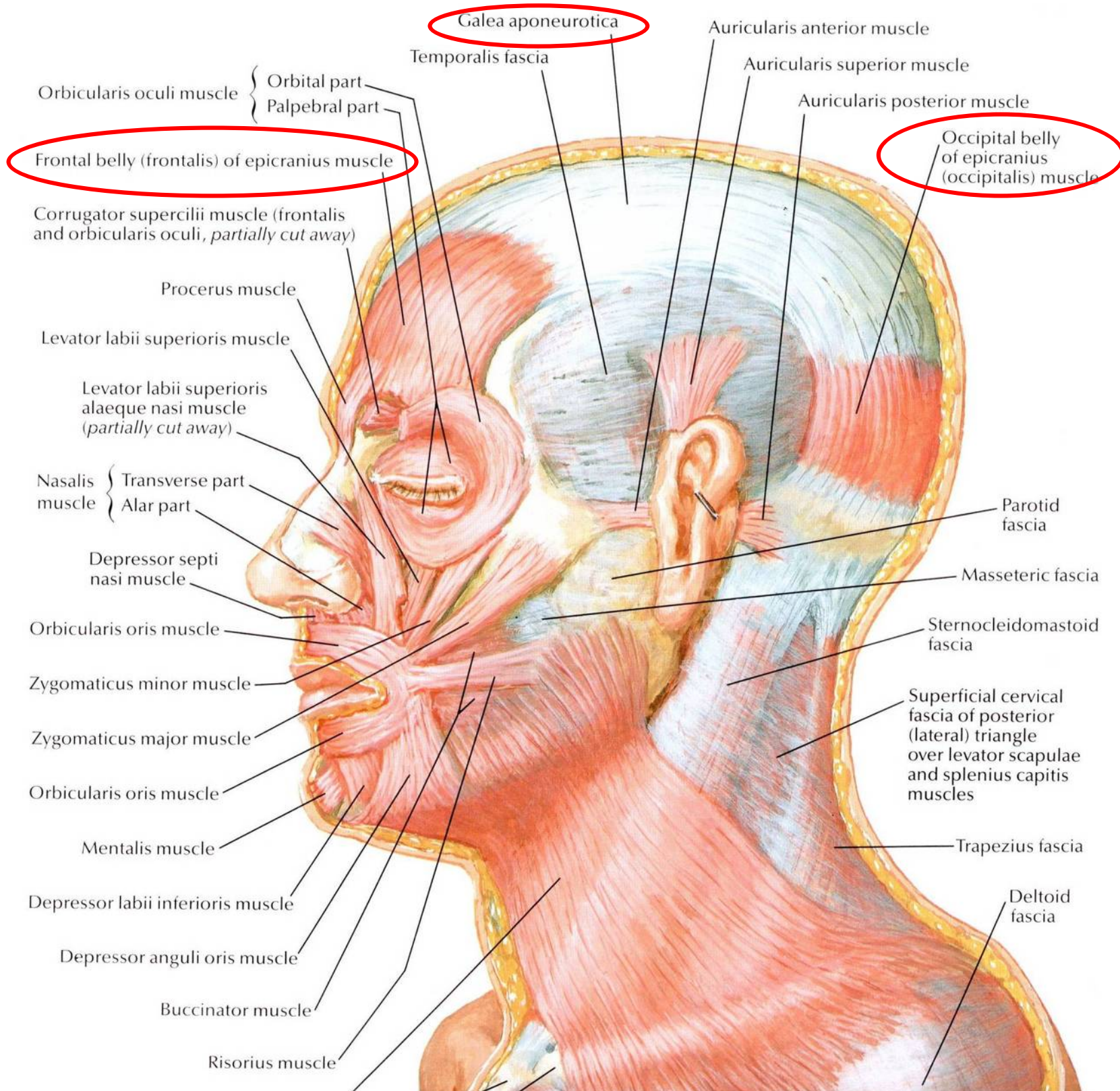
CONNECTIVE TISSUE



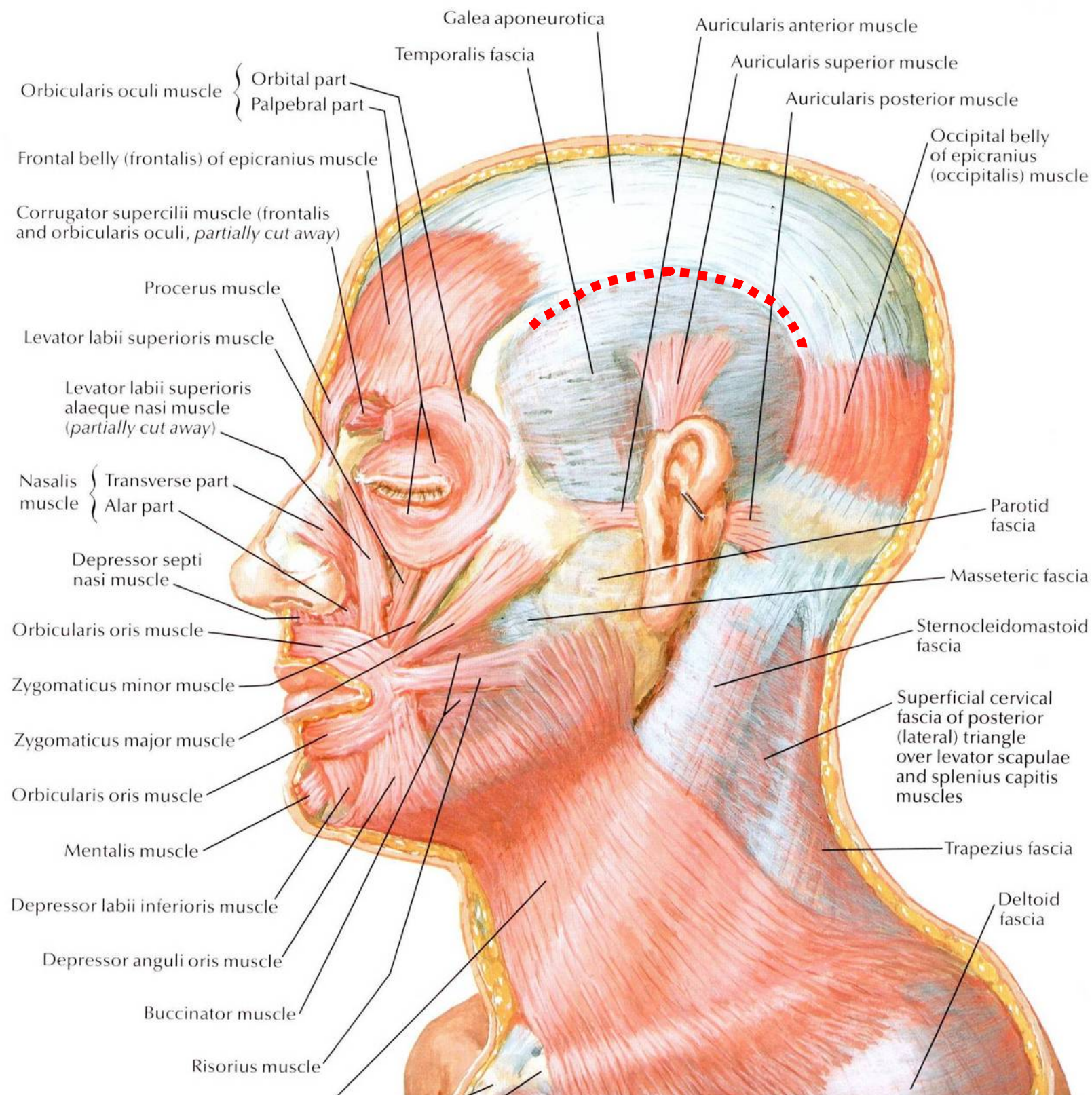
- fibro-fatty
- **fibrous septa** connect the skin to the underlying aponeurosis of the occipitofrontalis muscle.
- **numerous** arteries and veins (the **superficial veins** of the scalp)

- the arteries are branches of the external and internal carotid arteries, and a free **anastomosis** takes place between them.

APONEUROSIS

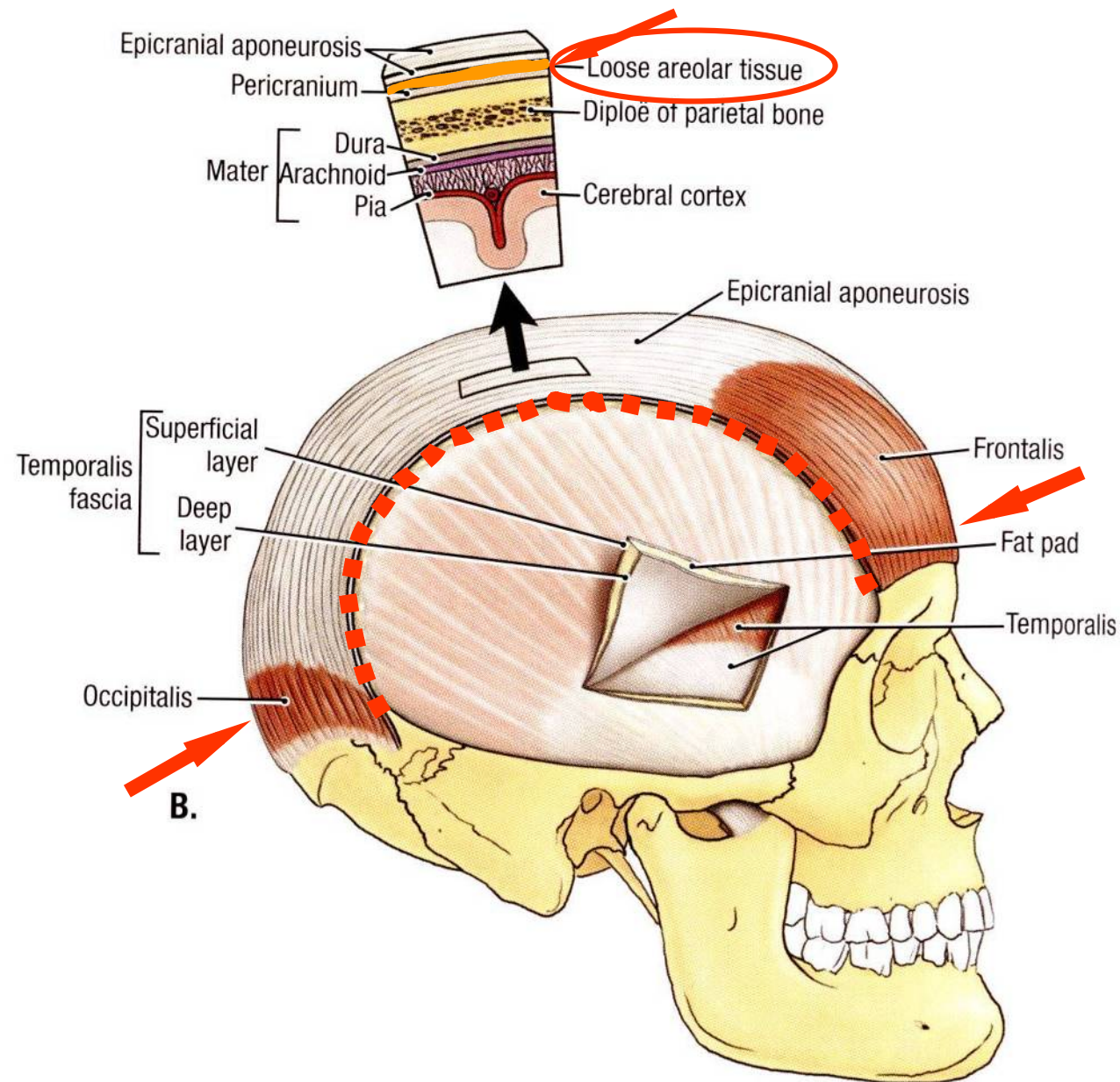


- **name:**
epicranial aponeurosis, galea aponeurotica
- thin, tendinous sheet
- unites the occipital and frontal bellies of the **occipito-frontalis muscle**



- The lateral margins of the epicranial aponeurosis are attached to the temporal fascia
- the skin, the subcutaneous connective tissue and the epicranial aponeurosis (layers 1, 2, 3) are adherent to each other and move as a one unit

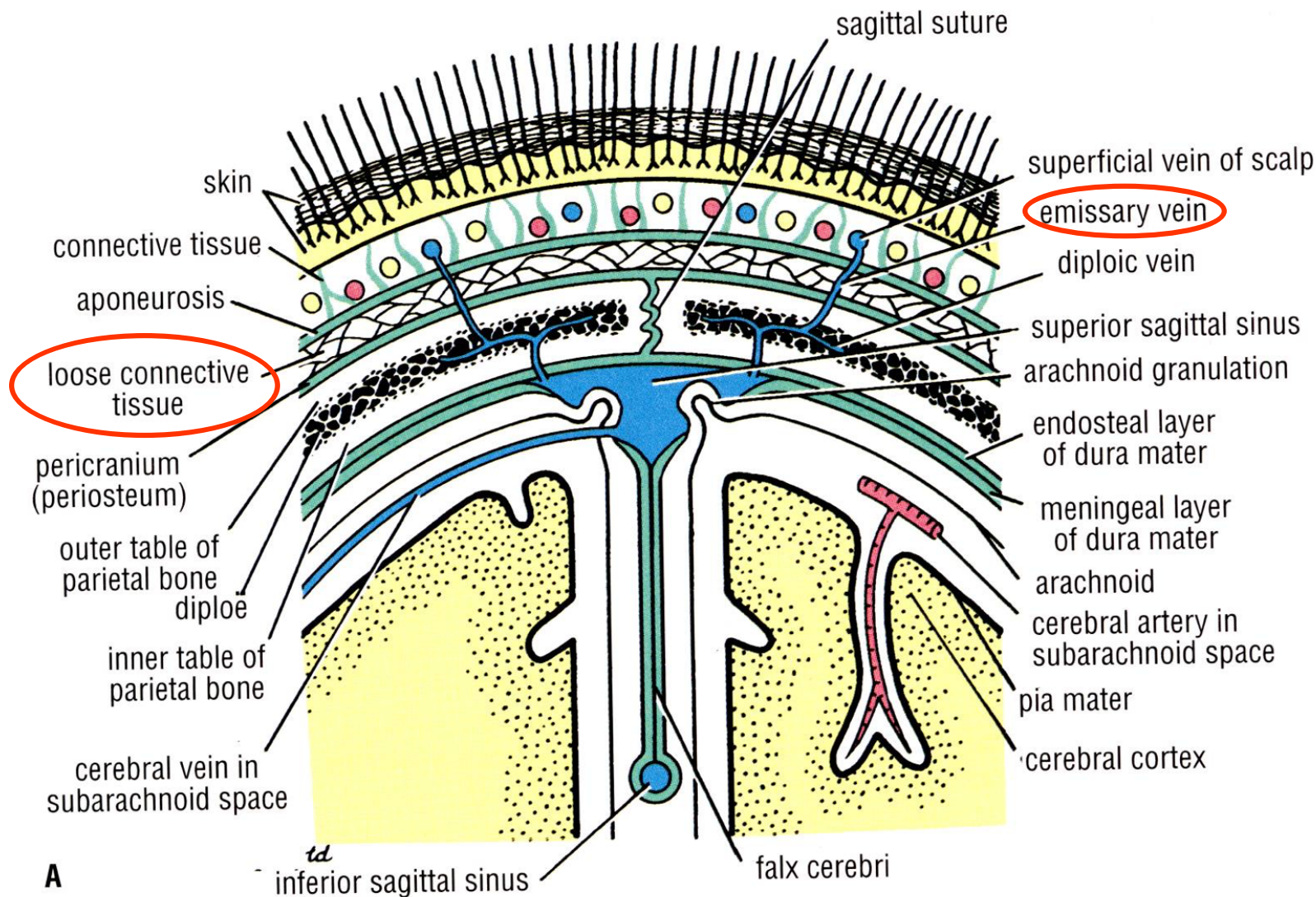
SUBAPONEUROTIC SPACE



- **potential space** beneath the epicranial aponeurosis
- **limited in front and behind** by the origins of the occipitofrontalis muscle
- **extends laterally** as far as the attachment of the aponeurosis to the temporal fascia
- **occupied** by loose areolar tissue

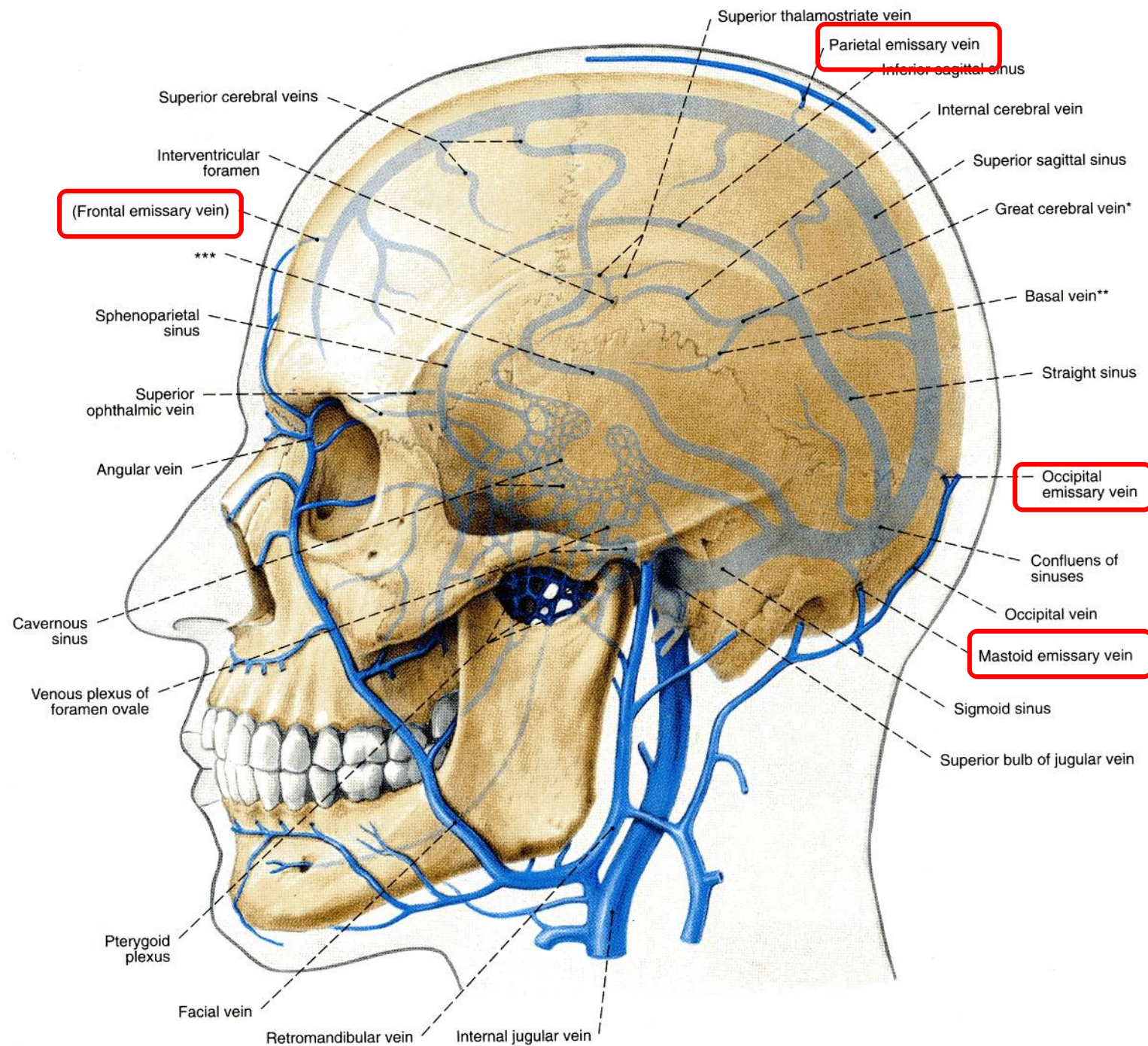
LOOSE AREOLAR TISSUE

- Occupies the **subaponeurotic space**
- **loosely connects** the epicranial aponeurosis to the periosteum of the skull (the pericranium)
- contains a few small arteries
- contains some important **emissary veins**

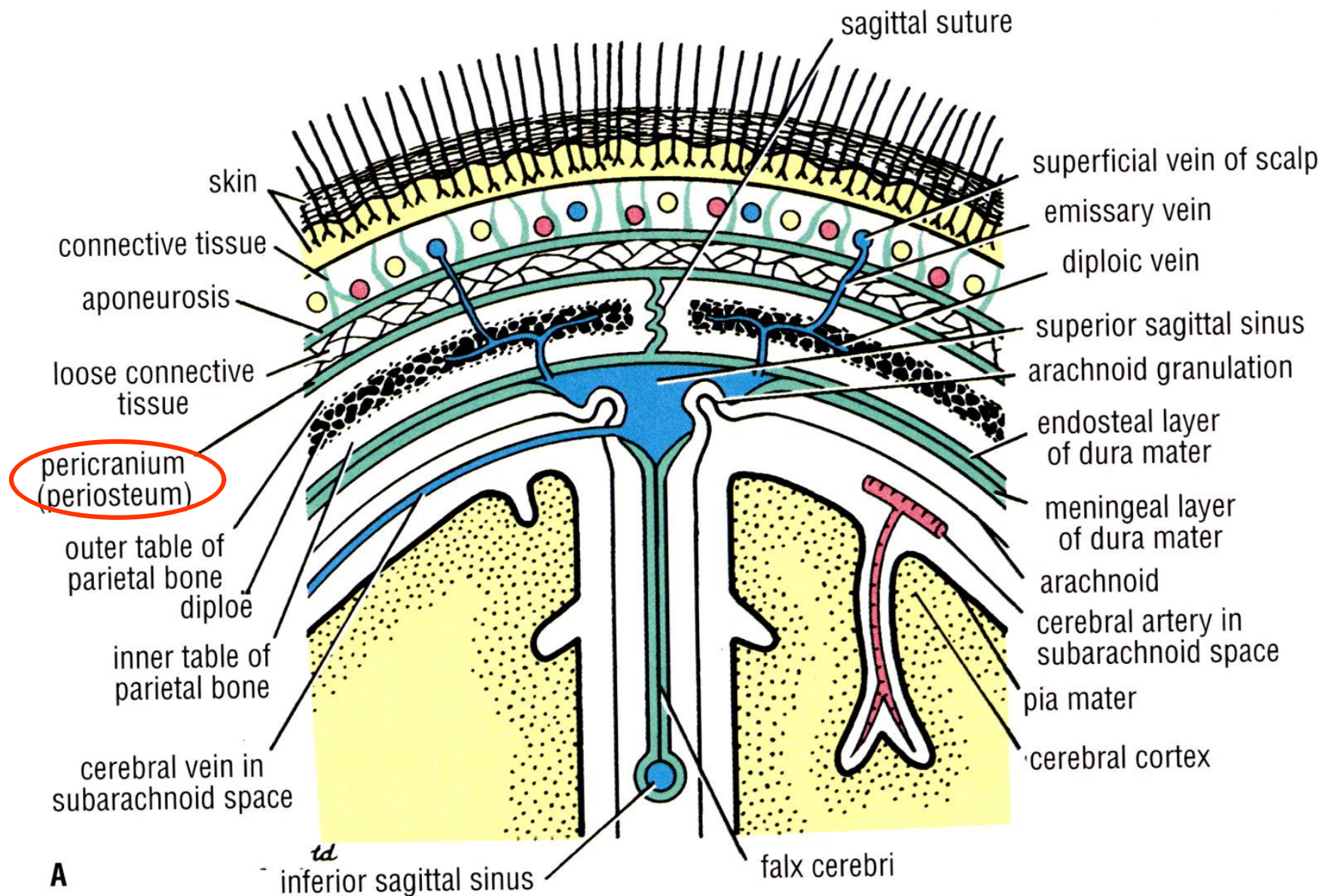


EMISSARY VEINS

- Emissary veins:
are **valveless**
veins
- **They connect the superficial veins of the scalp with the diploic veins of the skull bones and, through them, with the intracranial venous sinuses**



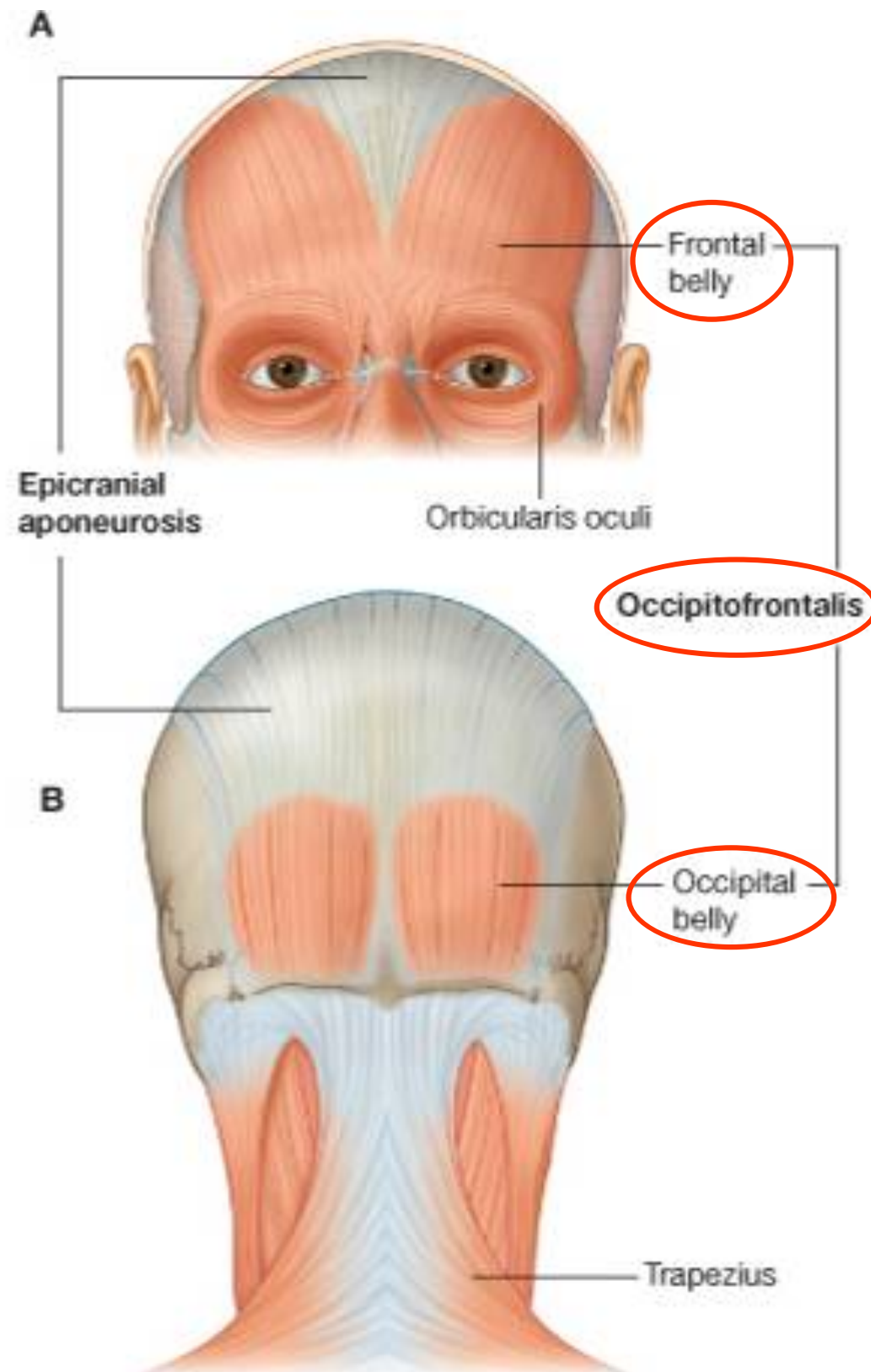
PERICRANIUM



- It is the **periosteum** covering the outer surface of the skull bones

- at the sutures between individual skull bones, the periosteum on the outer surface of the bones **is continuous** with the periosteum on the inner surface of the skull bones

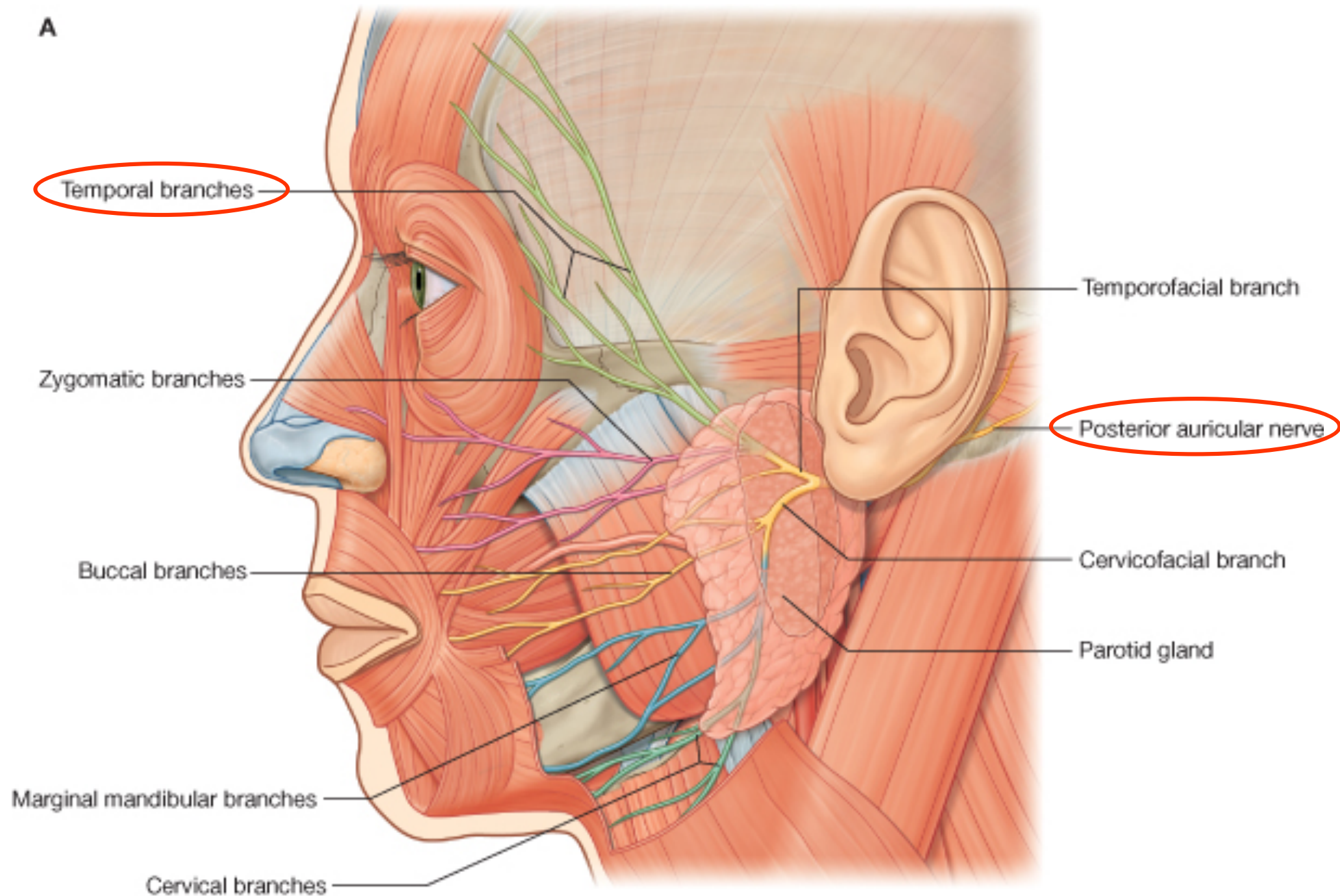
MUSCLES OF THE SCALP



Occipitofrontalis (epicranius)

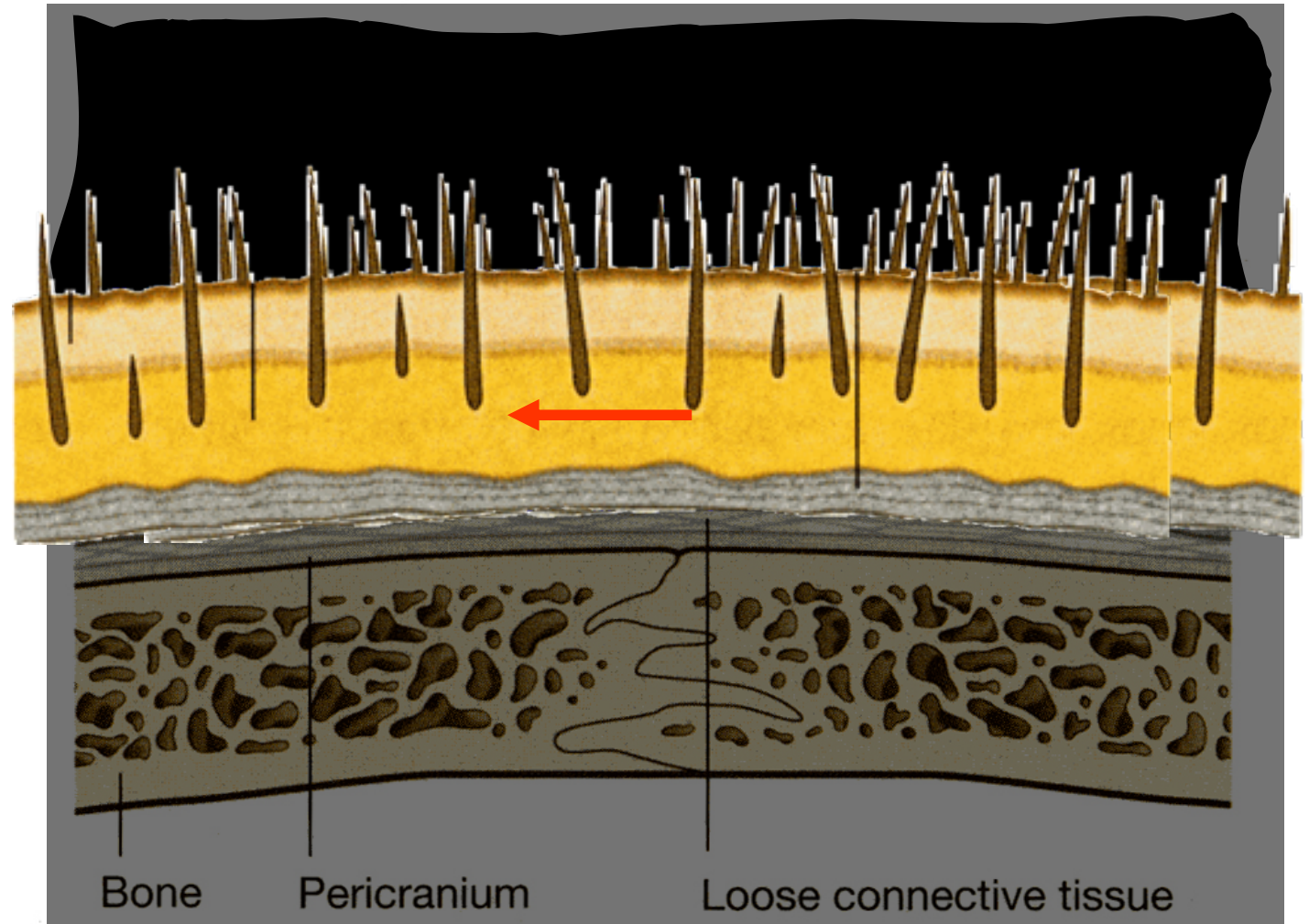
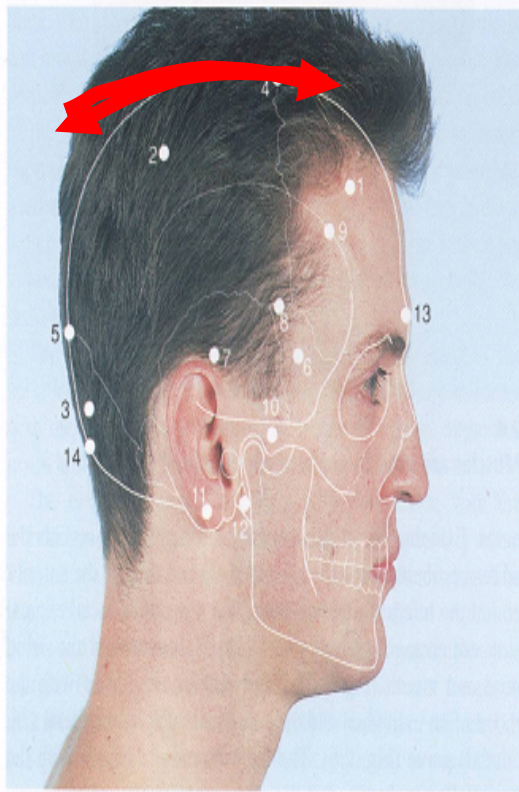
- **Origin:** It consists of four bellies, two occipital and two frontal, connected by an aponeurosis.
- **The occipital bellies are smaller and** arise from the highest nuchal line on the occipital bone and pass forward to be attached to the aponeurosis.
- **The frontal bellies are larger and closer to each other in the middle line**
- **They** arise from the skin and superficial fascia of the eyebrow and pass backward to be attached to the aponeurosis.

A



Nerve supply:

- The **occipital belly** is supplied by the posterior auricular branch of the facial nerve;
- the **frontal belly** is supplied by the temporal branch of the facial nerve.



Action

The first three layers of the scalp can be **moved forward or backward**, the loose areolar tissue of the fourth layer of the scalp allowing the aponeurosis to move on the pericranium.
(e.g. layers 1, 2, 3 will slide together as ONE LAYER)

Which nerve is responsible for this action?

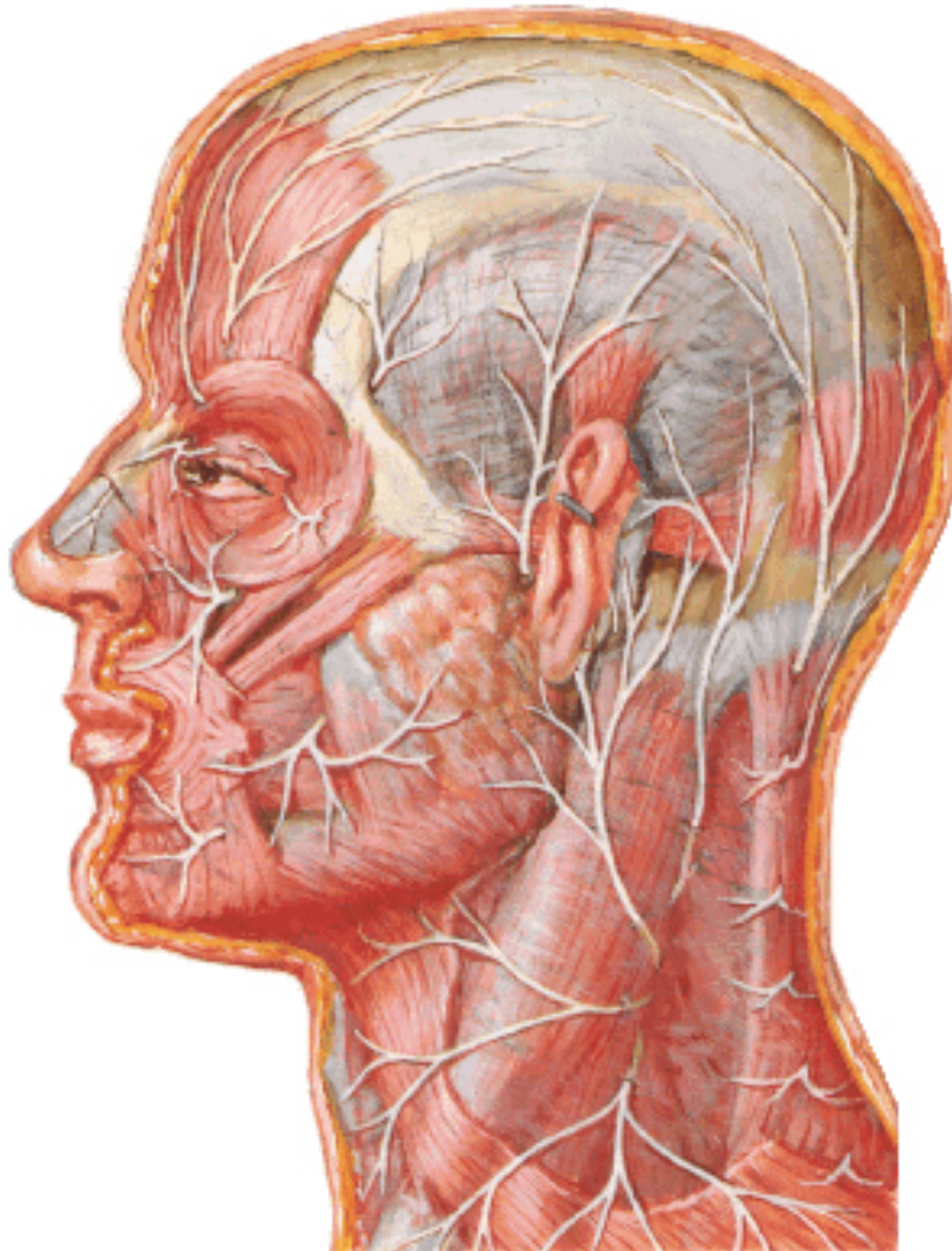
- The temporal branch of the facial nerve.



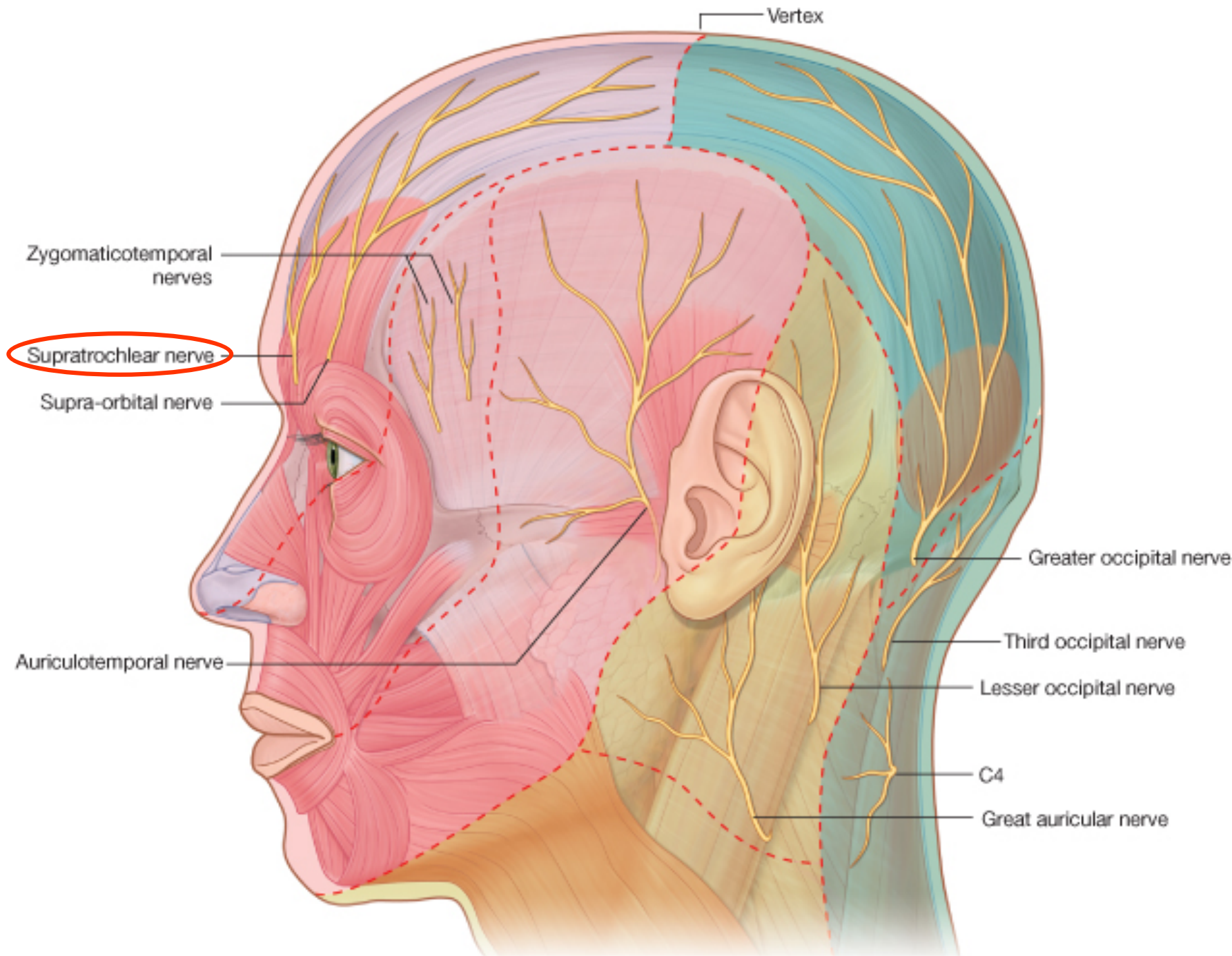
Occipitofrontalis

The **frontal bellies** of the occipitofrontalis can raise the eyebrows in expressions of surprise or horror.

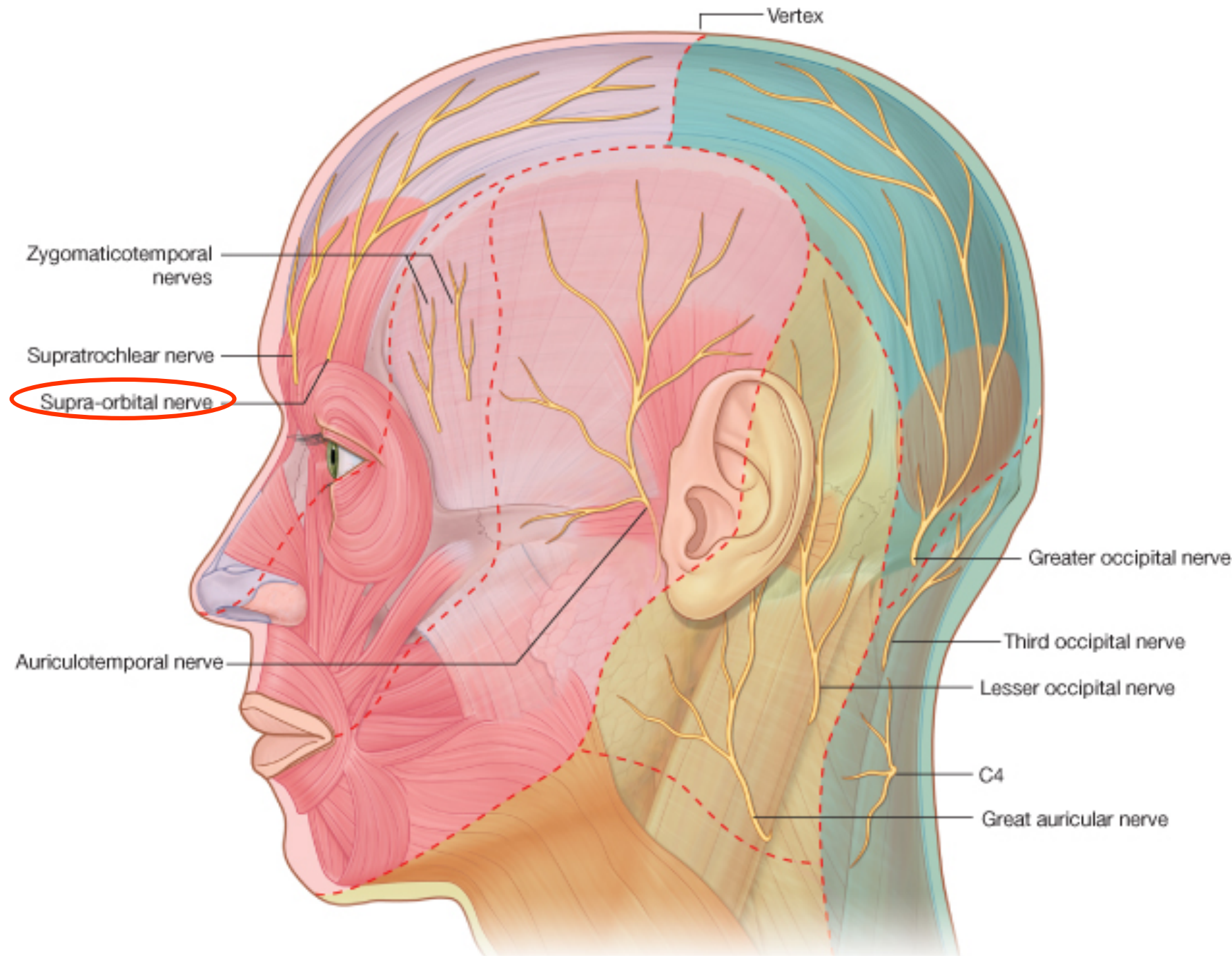
SENSORY NERVE SUPPLY OF THE SCALP



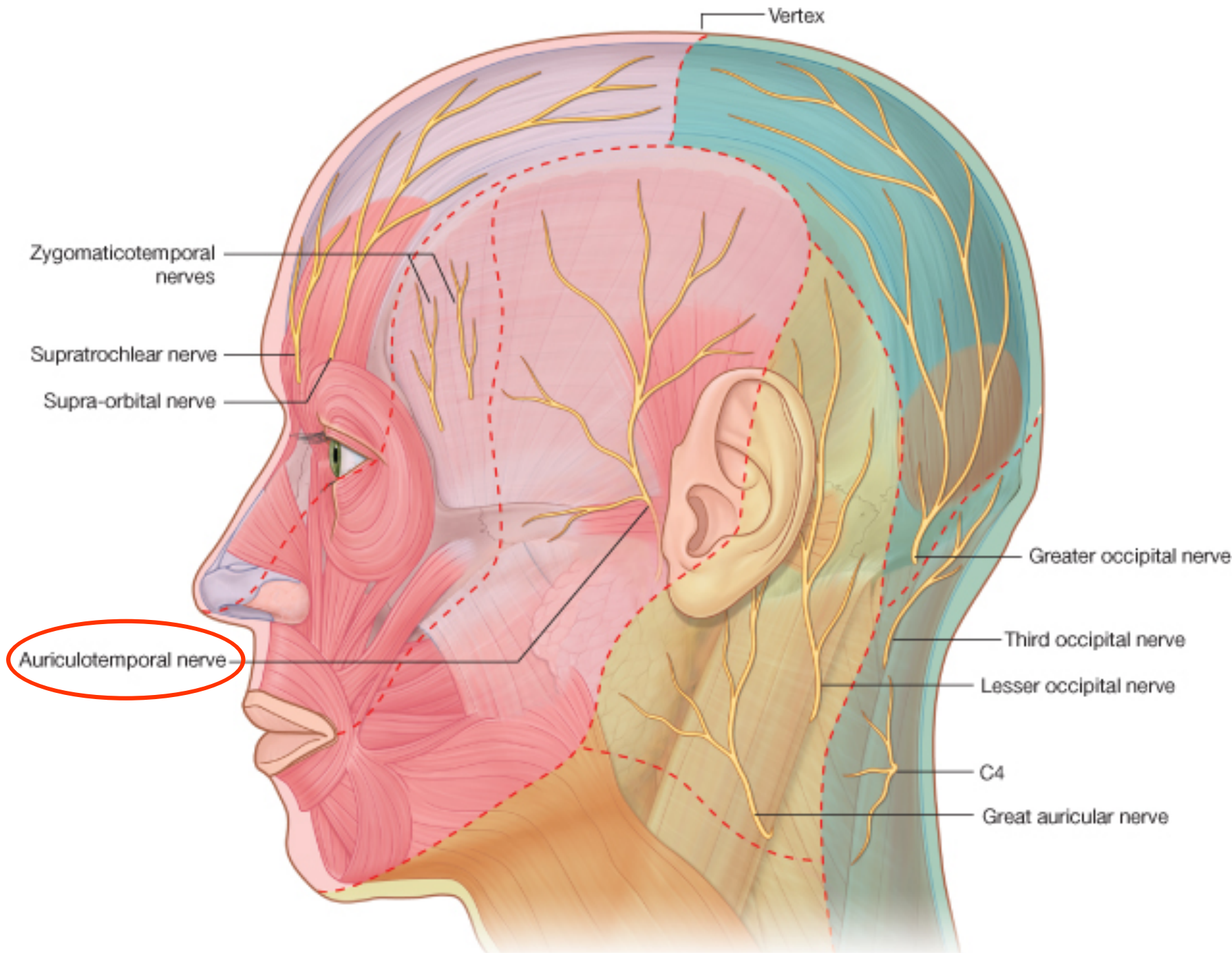
The main trunks of the sensory nerves lie in the **superficial fascia**.



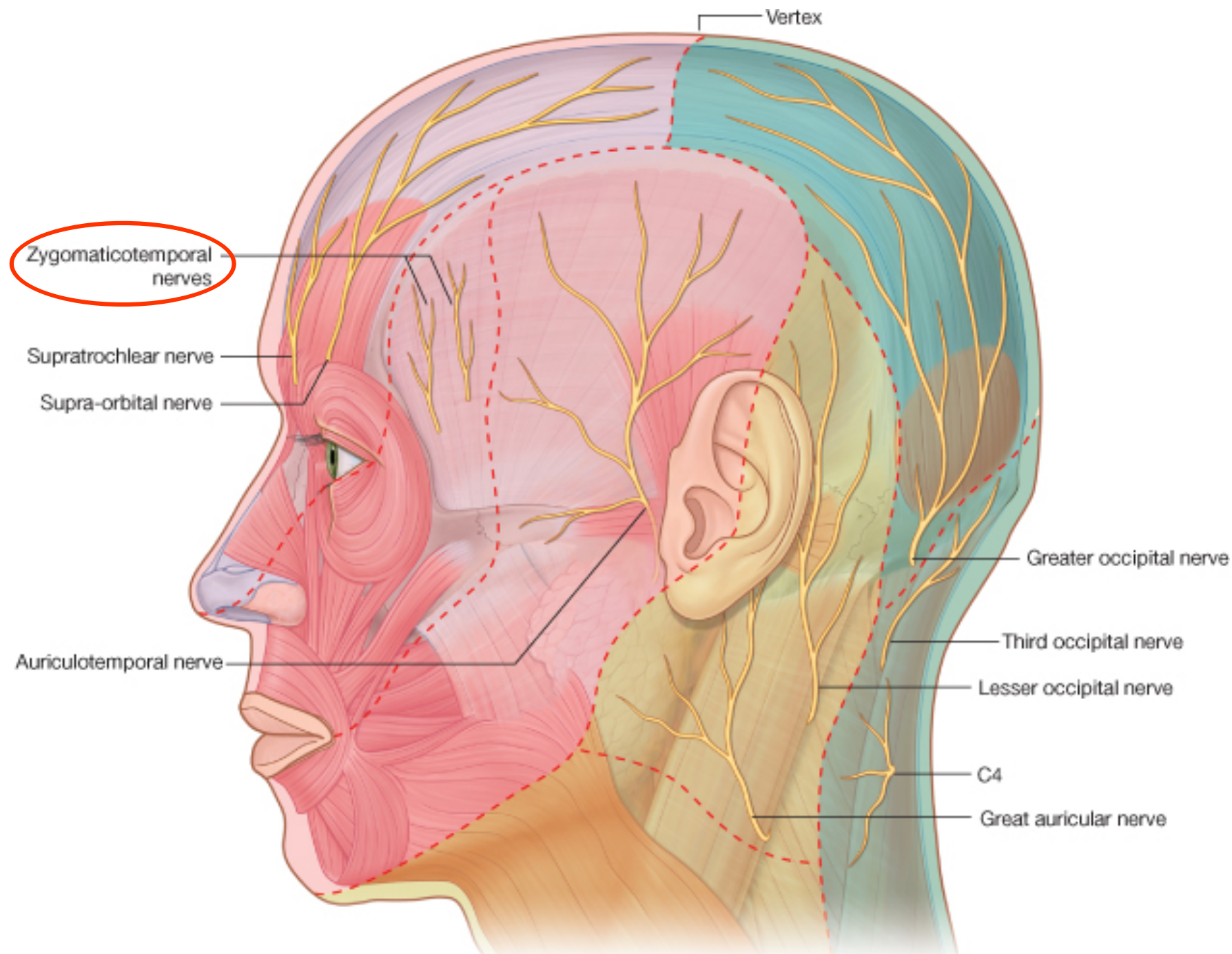
- The **supra-trochlear nerve**, a branch of the ophthalmic division of the trigeminal nerve, winds around the superior orbital margin and supplies the scalp.
- It passes backward close to the median plane and reaches nearly as far as the vertex of the skull.



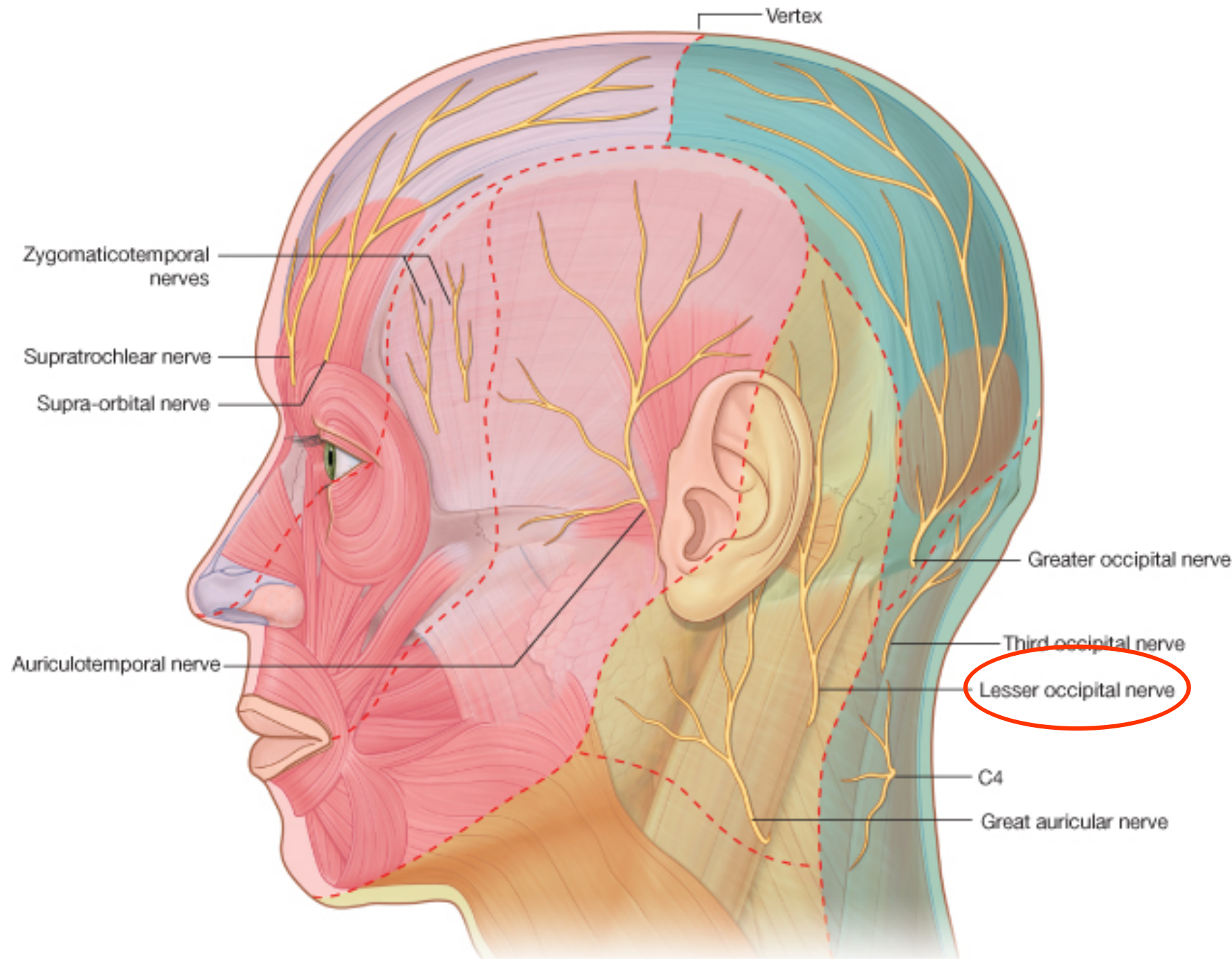
- The **supra-orbital nerve**, a branch of the ophthalmic division of the trigeminal nerve, winds around the superior orbital margin and ascends over the forehead.
- It supplies the scalp as far backward as the vertex.



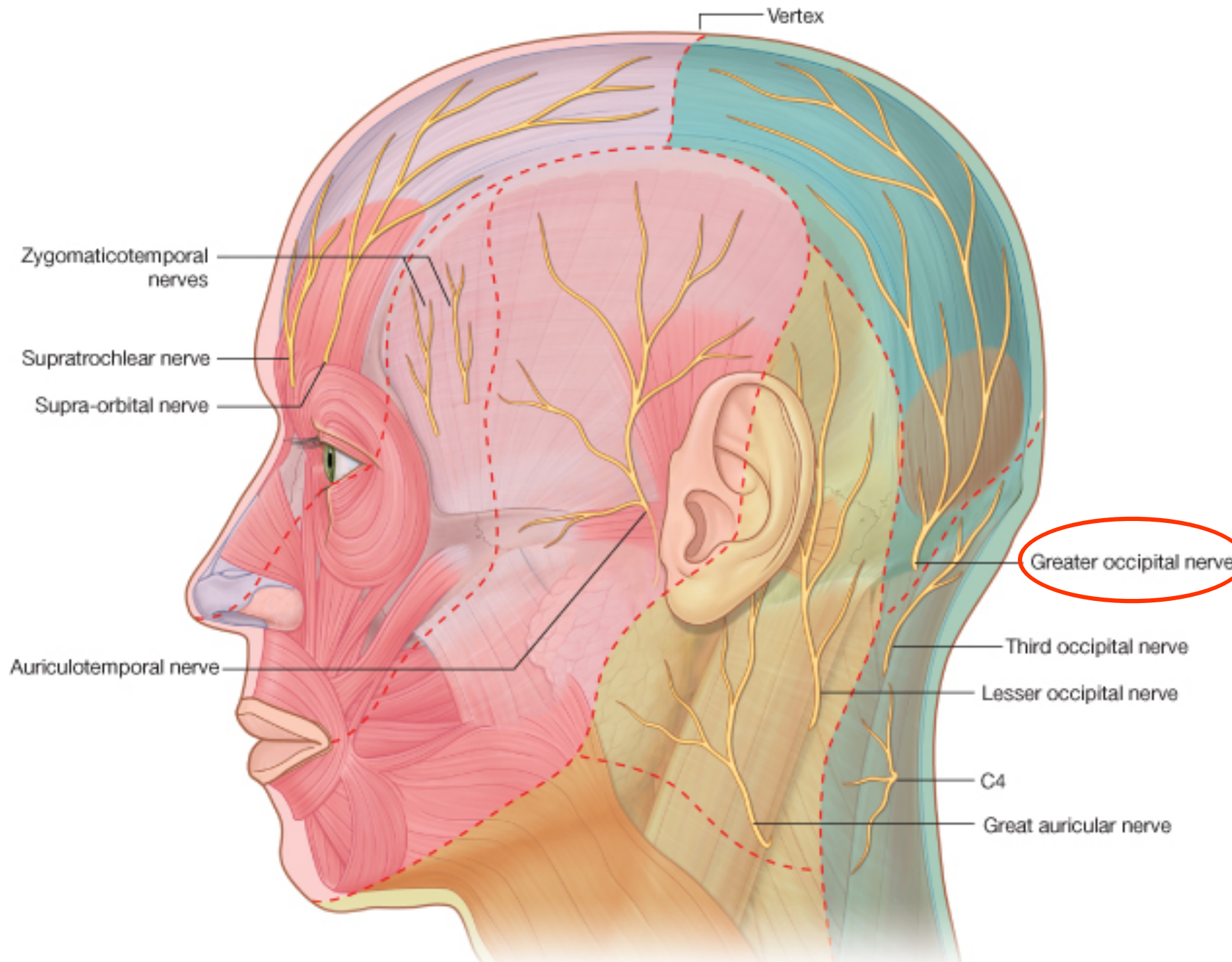
- The **auriculotemporal nerve**, a branch of the mandibular division of the trigeminal nerve, ascends over the side of the head from in front of the auricle.
- Its terminal branches supply the skin over the temporal region.



The **zygomaticotemporal nerve**, a branch of the maxillary division of the trigeminal nerve, supplies the scalp over the temple.

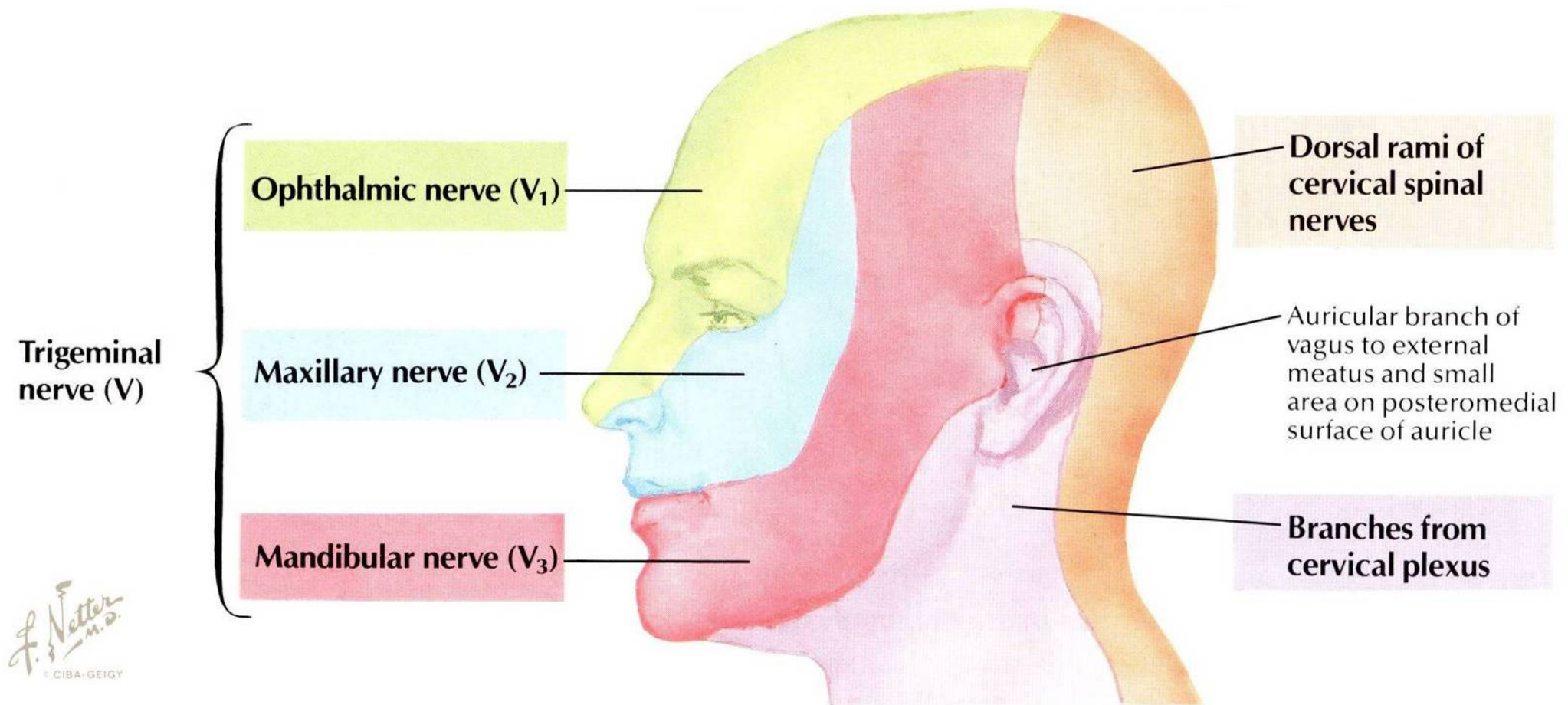


The **lesser occipital nerve**, a branch of the cervical plexus (C2), supplies the scalp over the lateral part of the occipital region and the skin over the medial surface of the auricle.

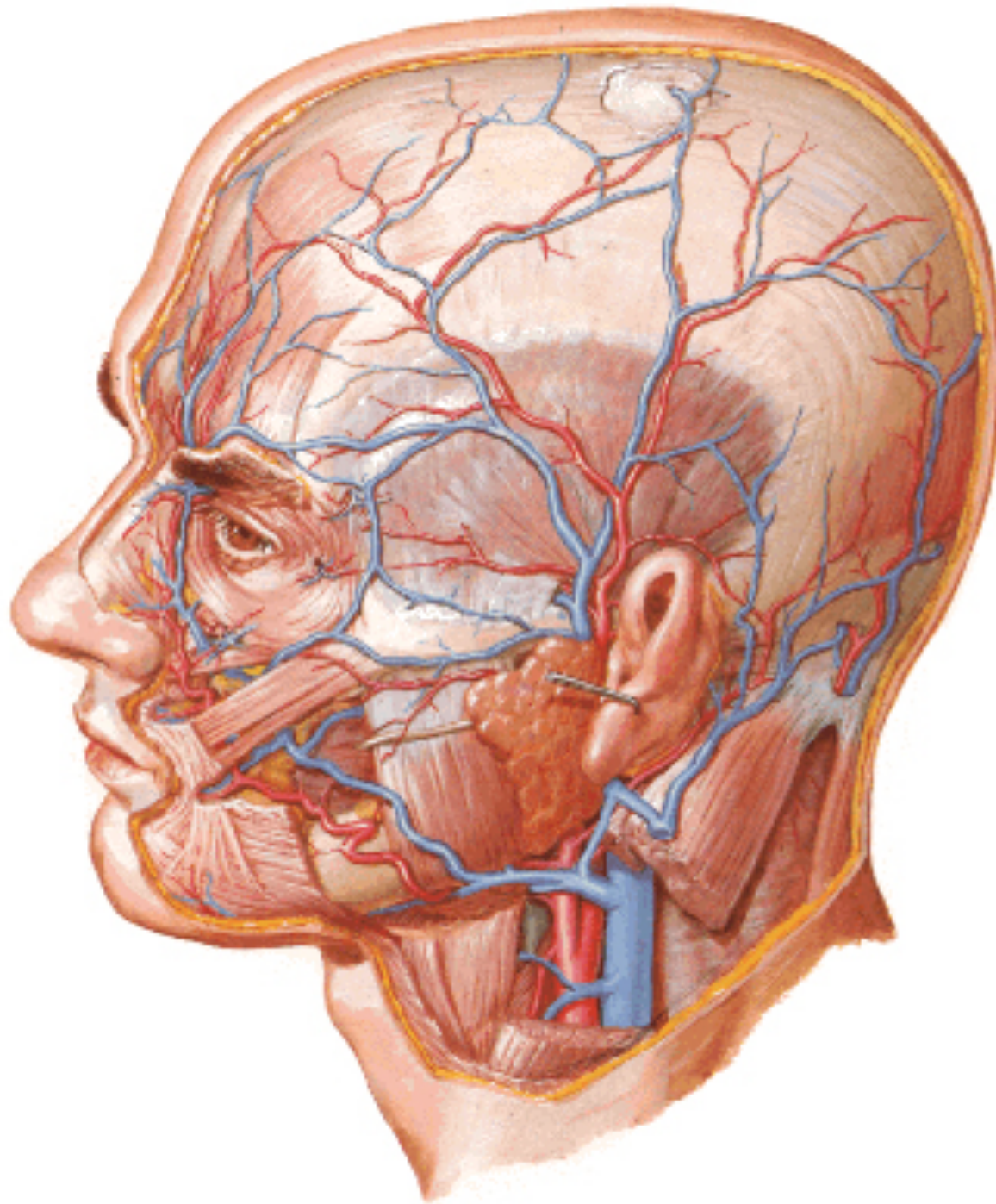


The **greater occipital nerve**, a branch of the posterior ramus of the second cervical nerve, ascends over the back of the scalp and supplies the skin as far forward as the vertex of the skull.

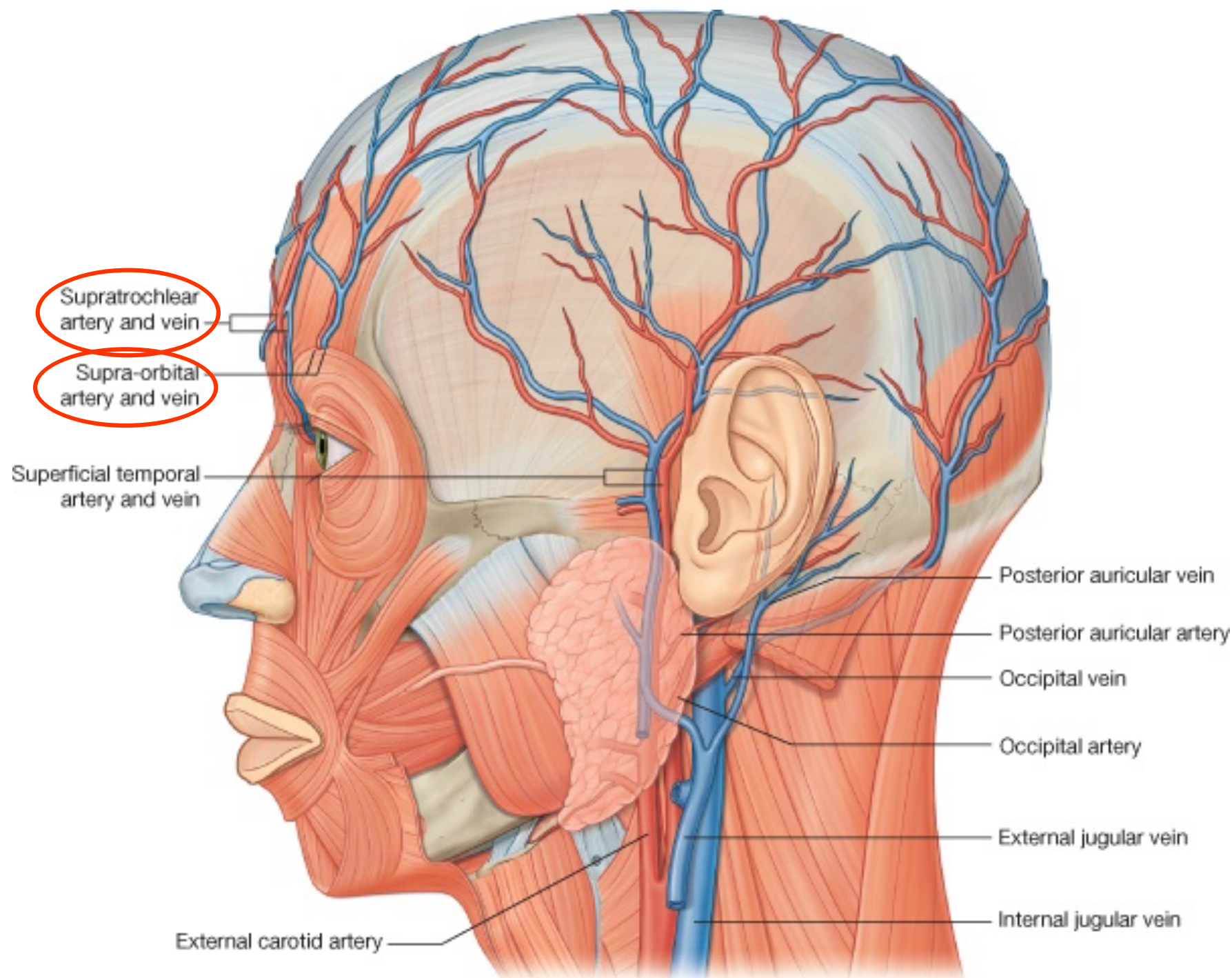
SENSORY NERVE SUPPLY (in brief)



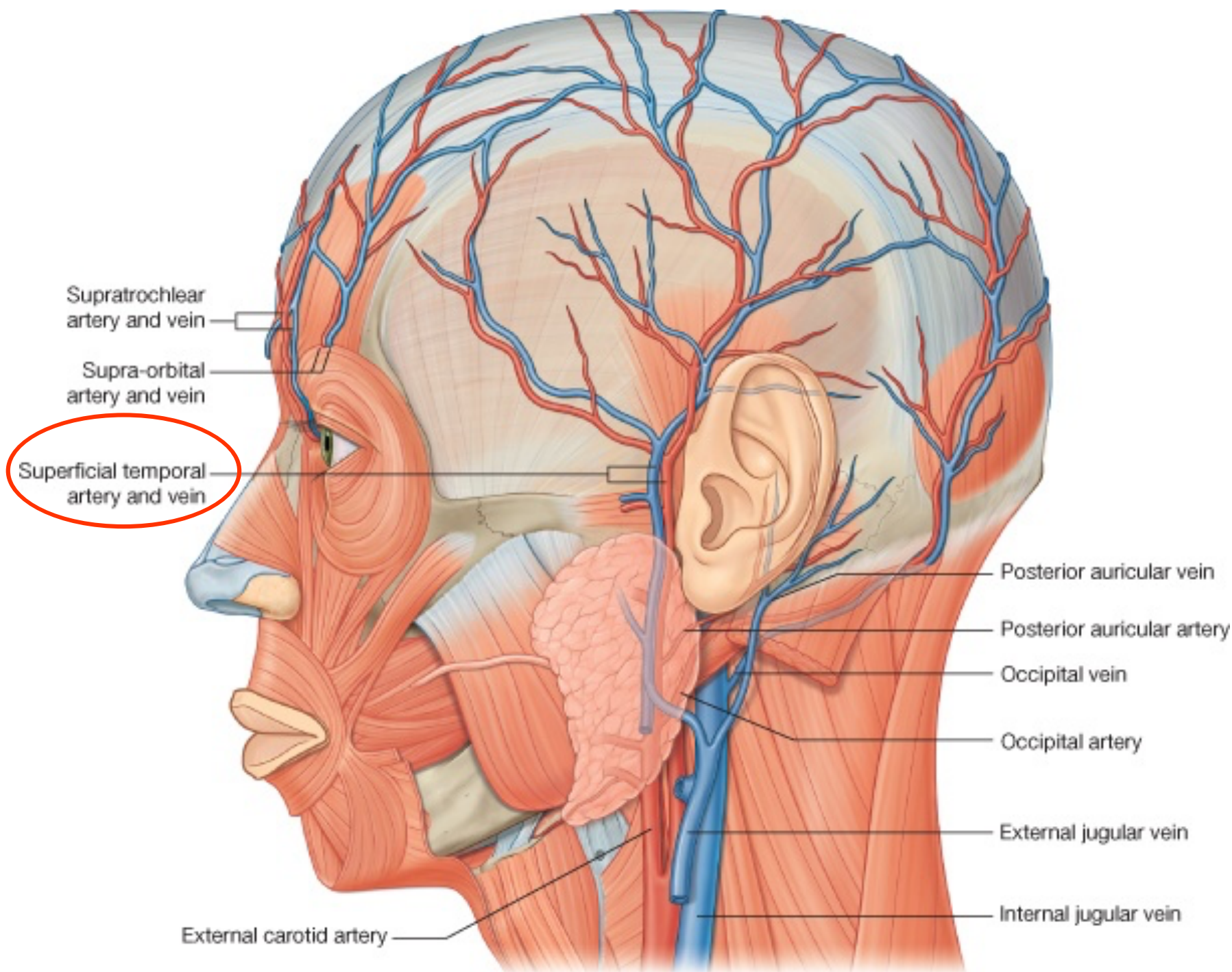
ARTERIAL SUPPLY OF THE SCALP



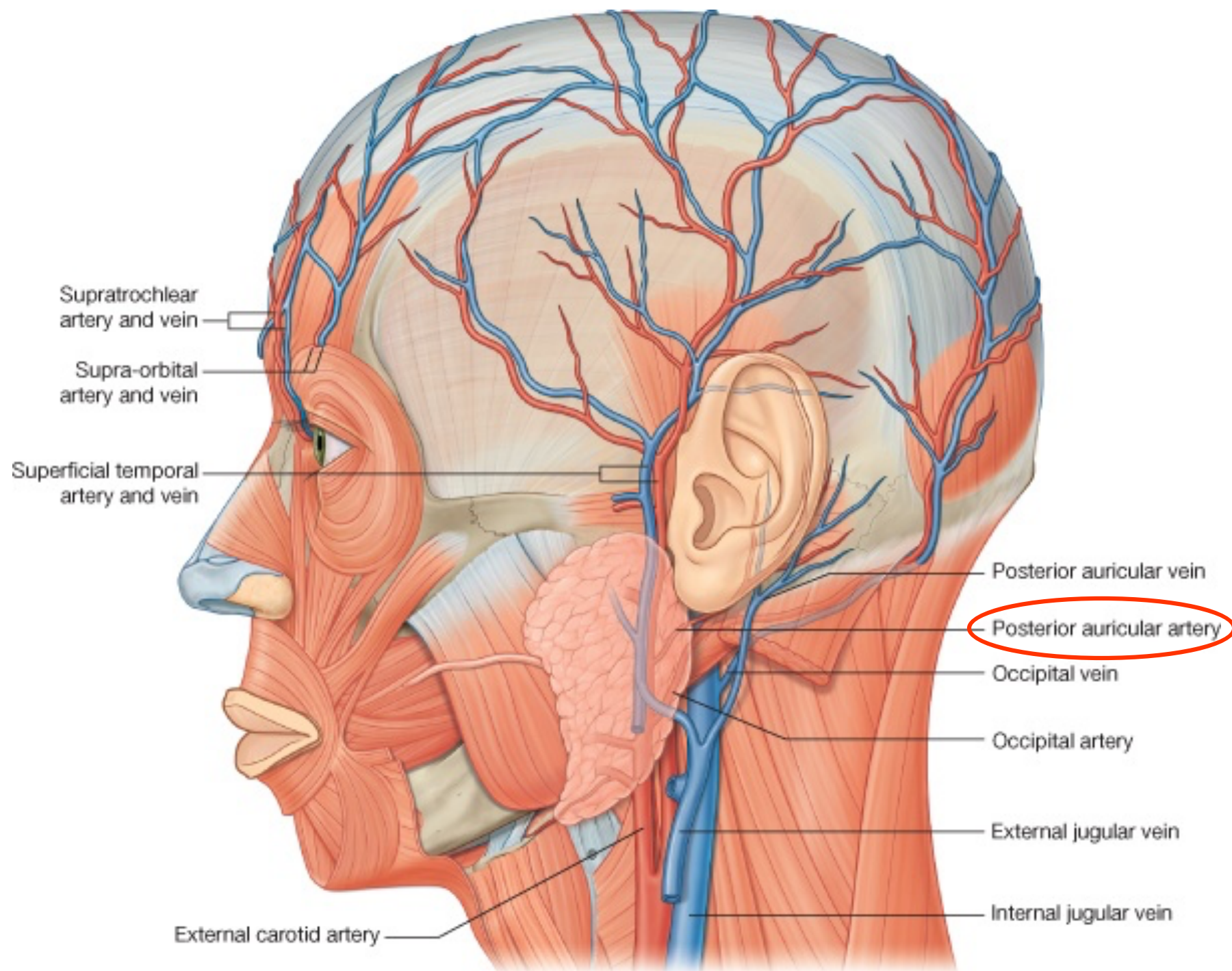
- The scalp has a **rich supply of blood** to nourish the hair follicles, and, for this reason, **the smallest cut bleeds profusely.**
- The arteries lie in the superficial fascia.



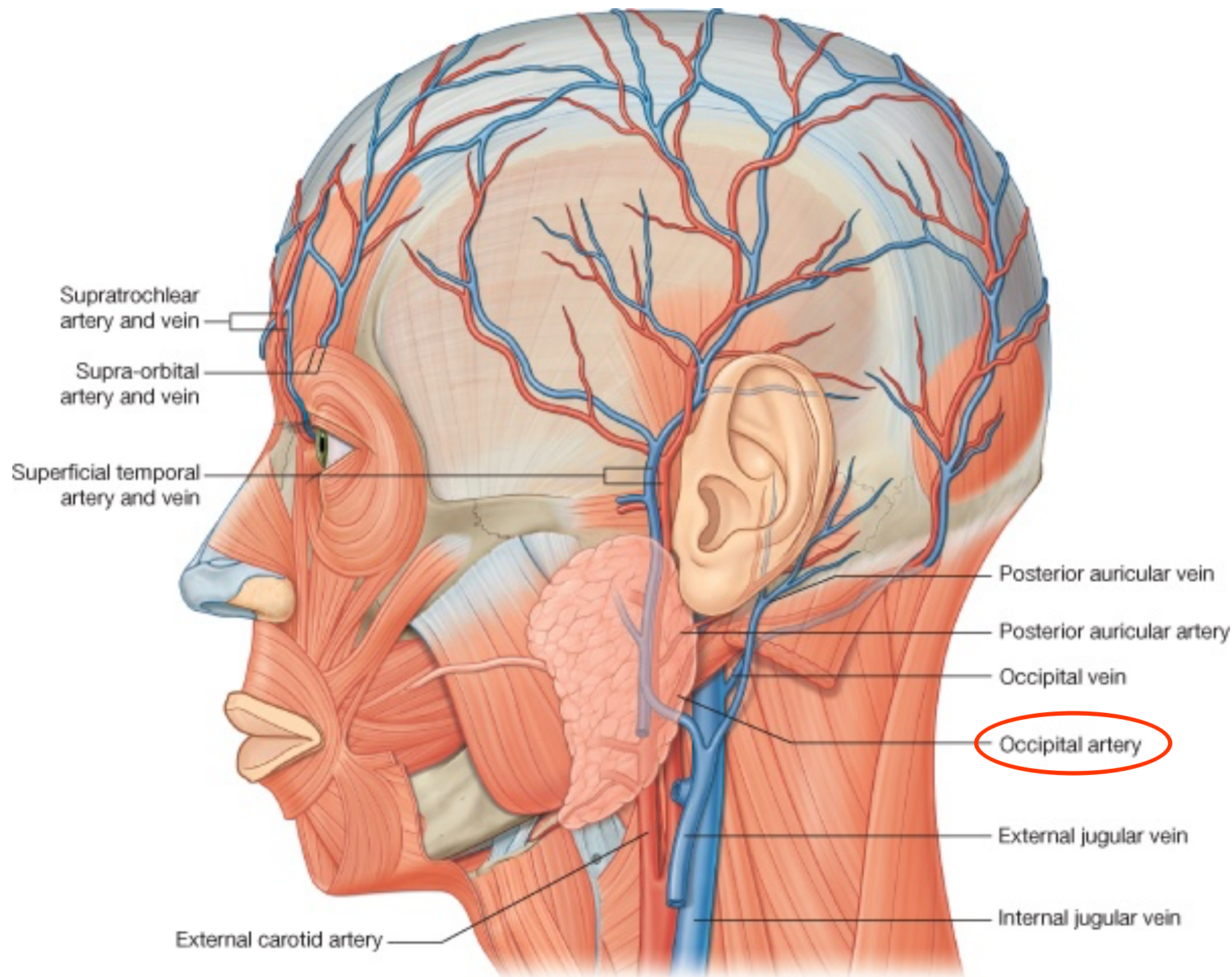
The supratrochlear and the supraorbital arteries, branches of the ophthalmic artery, ascend over the forehead in company with the supratrochlear and supraorbital nerves.



- **The superficial temporal artery**, the smaller terminal branch of the external carotid artery, ascends in front of the auricle in company with the auriculo-temporal nerve.
- It divides into **anterior** and **posterior branches**, which supply the skin over the frontal and temporal regions.



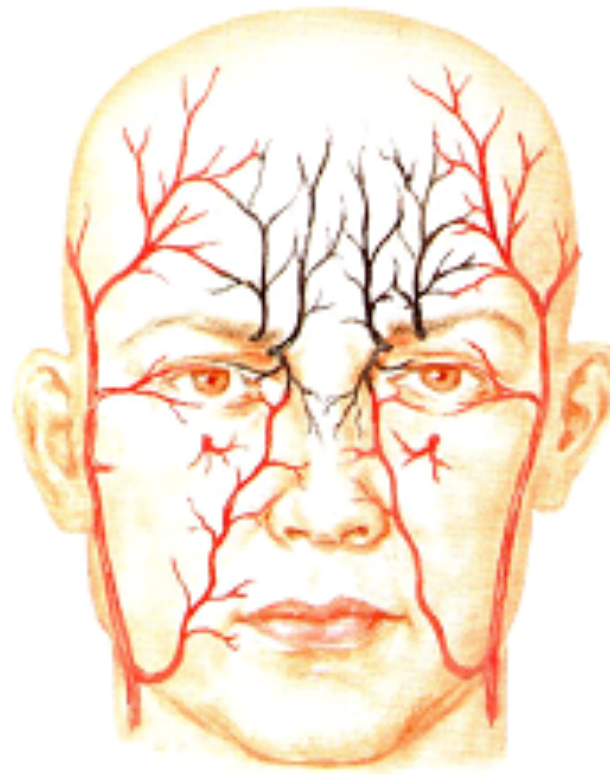
The posterior auricular artery, a branch of the external carotid artery, ascends behind the auricle to supply the scalp above and behind the auricle.



- **The occipital artery**, a branch of the external carotid artery, ascends from the apex of the posterior triangle, in company with the greater occipital nerve.
- It supplies the skin over the back of the scalp and reaches as high as the vertex of the skull.

ARTERIAL SUPPLY OF THE SCALP

(in brief)



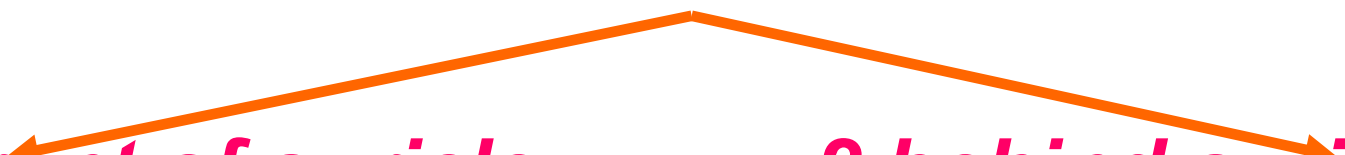
Sources of arterial supply of face

Black: from internal carotid artery (via ophthalmic artery)

Red: from external carotid artery

Arterial supply of scalp

They are 5 arteries on each side



3 in front of auricle

2 behind auricle

1- supratrochlear

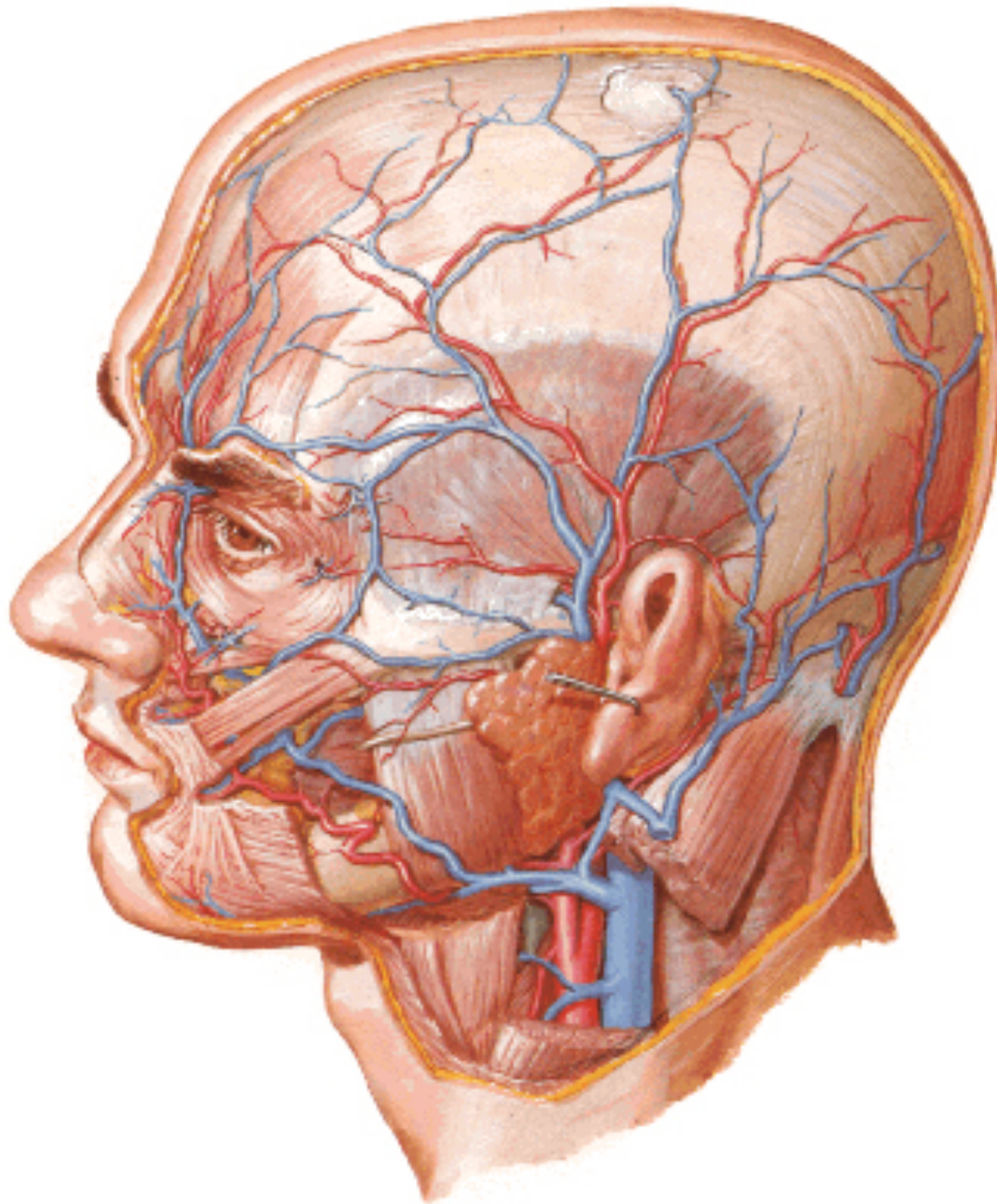
2- supraorbital

3- superficial temporal

1- post. auricular

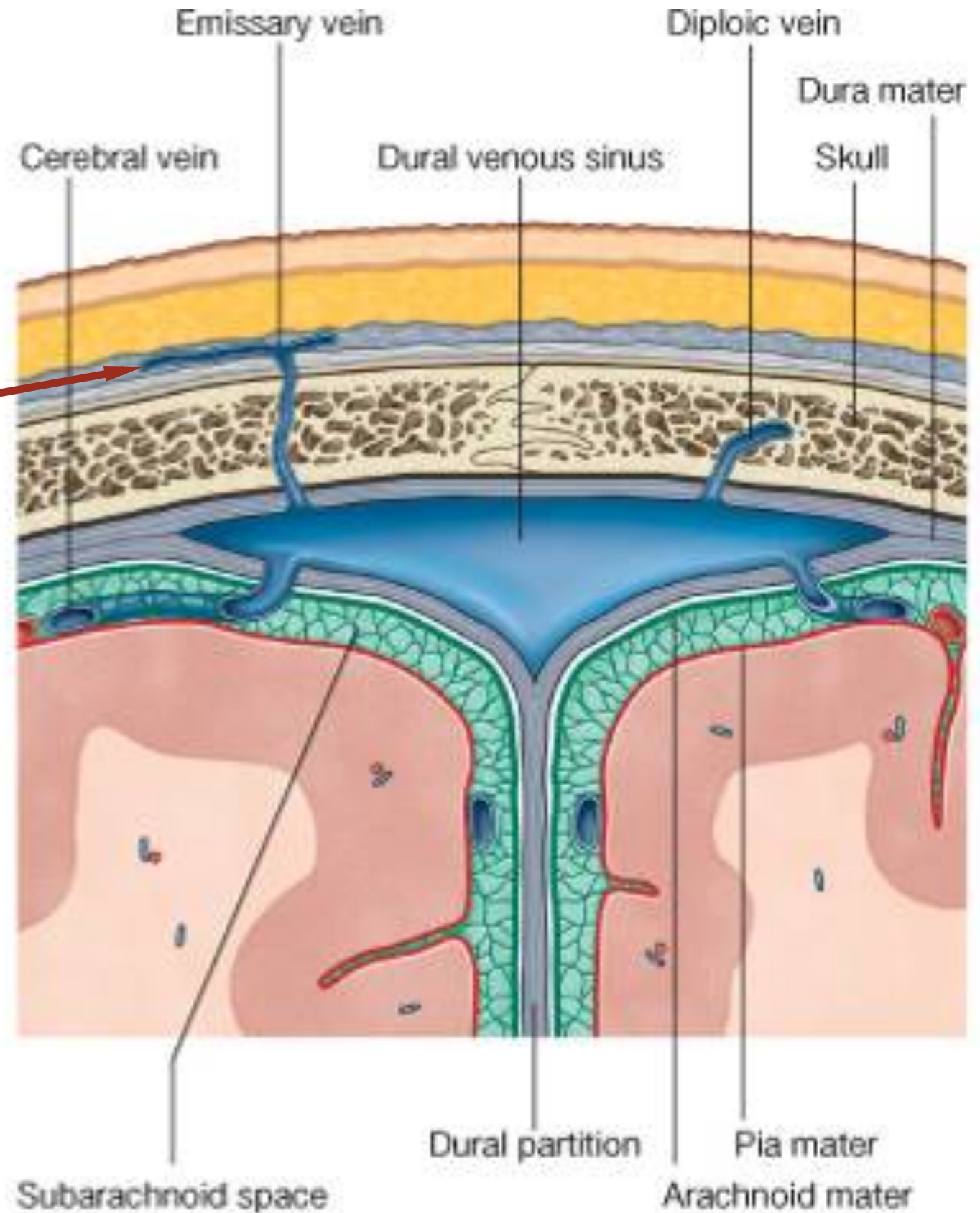
2- occipital

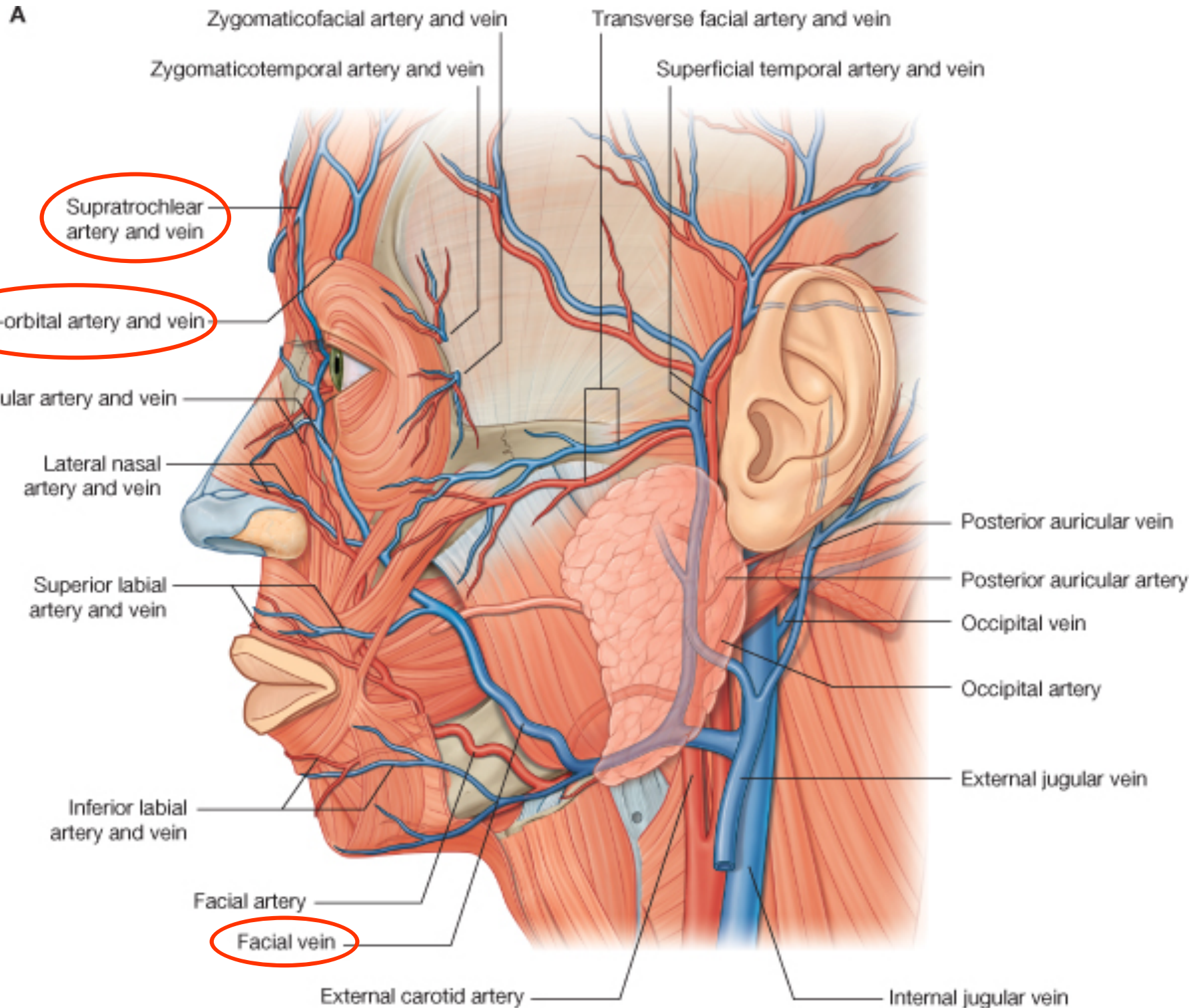
VENOUS DRAINAGE OF THE SCALP



The veins of the scalp freely anastomose with one another.

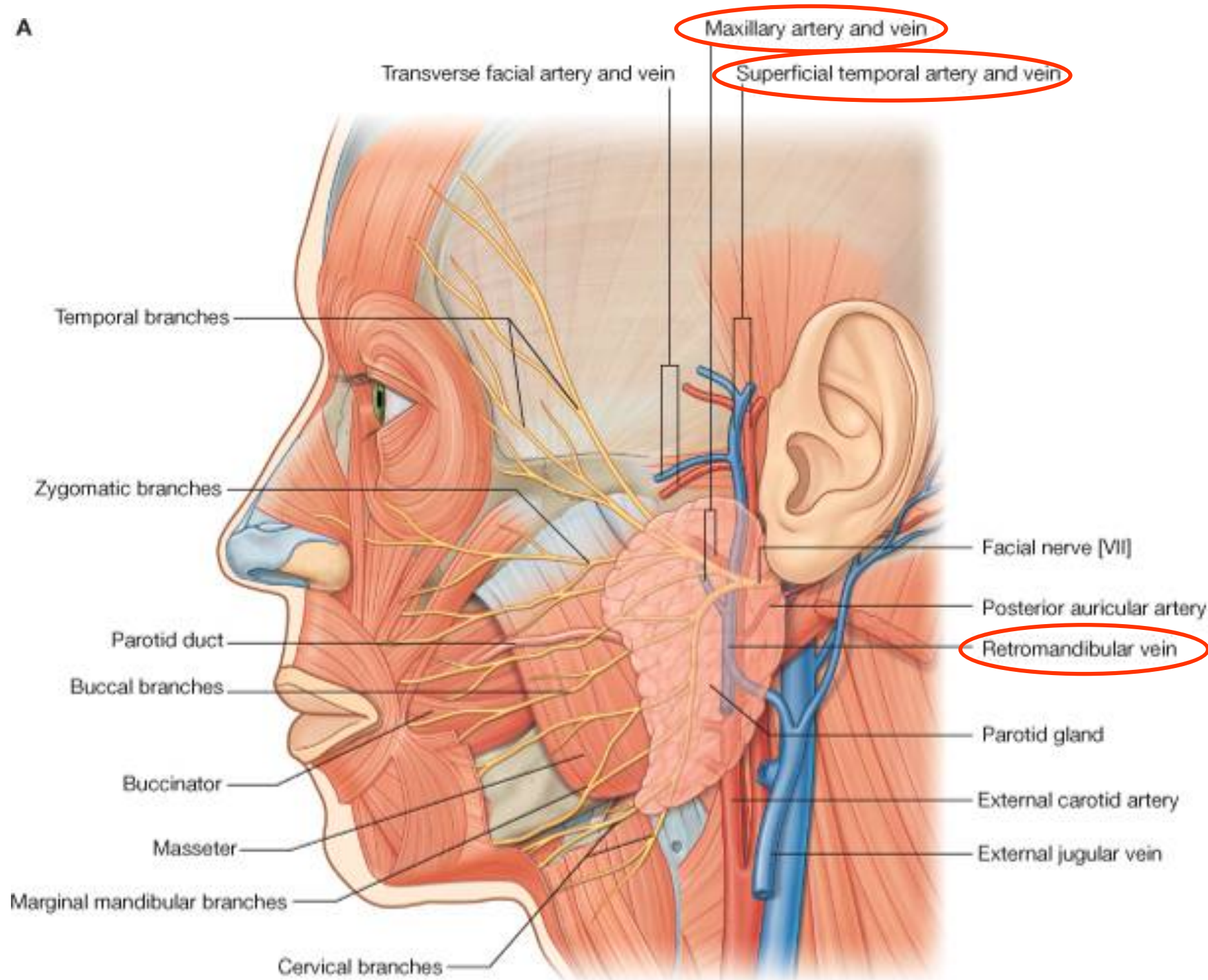
The **veins of the scalp** **are connected** to the diploic veins of the skull bones and the intracranial venous sinuses by the **valveless** emissary veins.



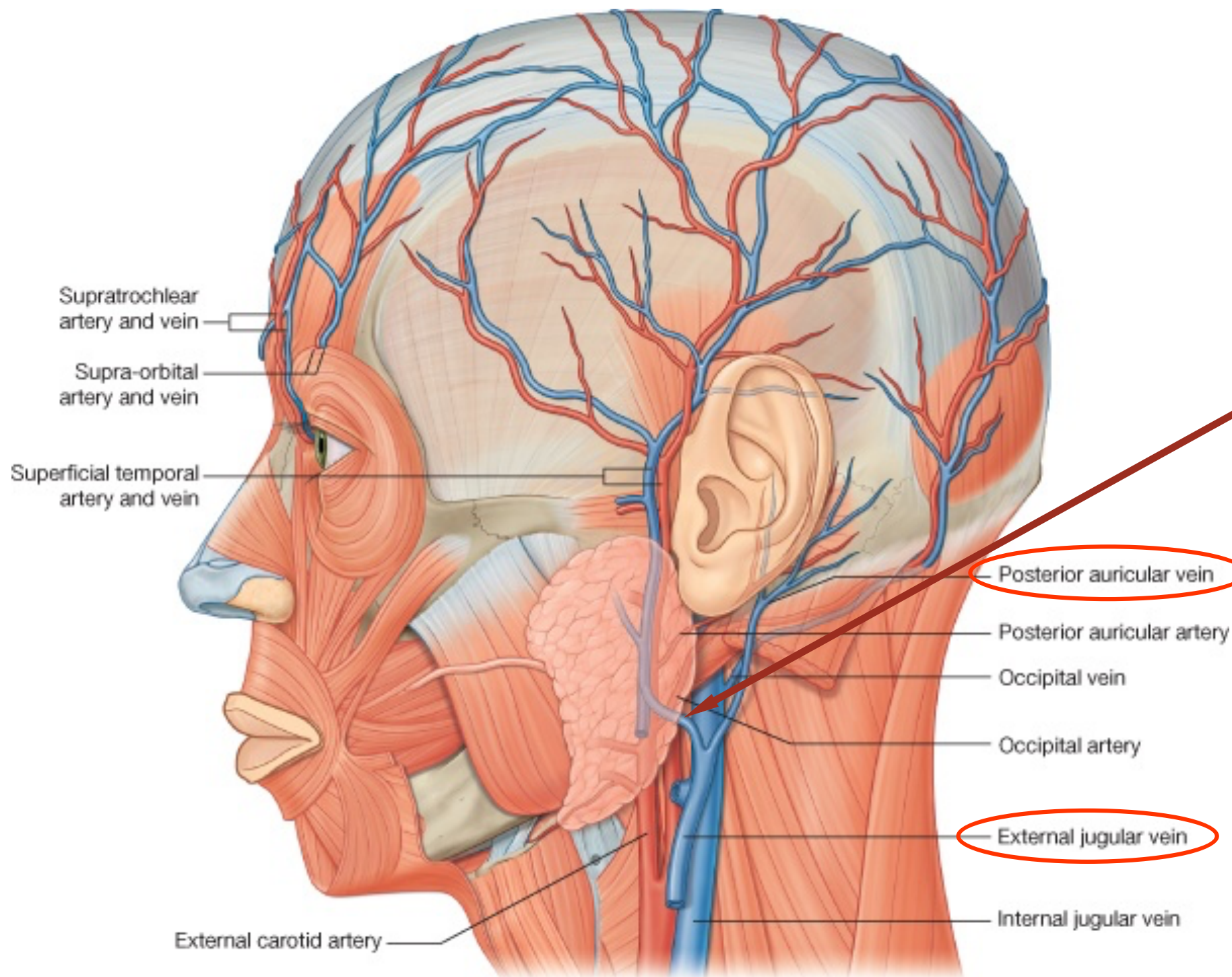


The supra-trochlear and supraorbital veins unite at the medial margin of the orbit to form the facial vein.

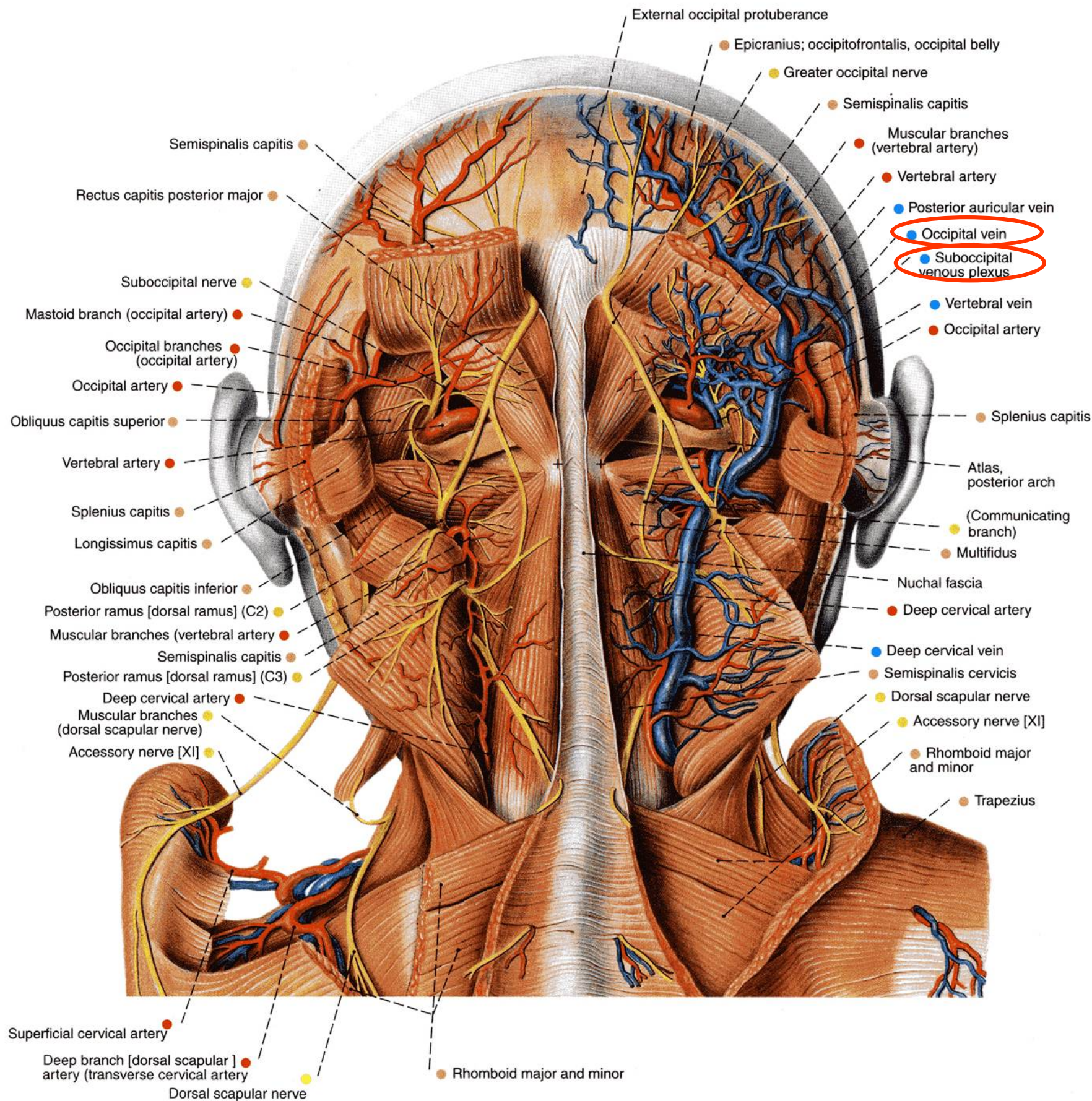
A



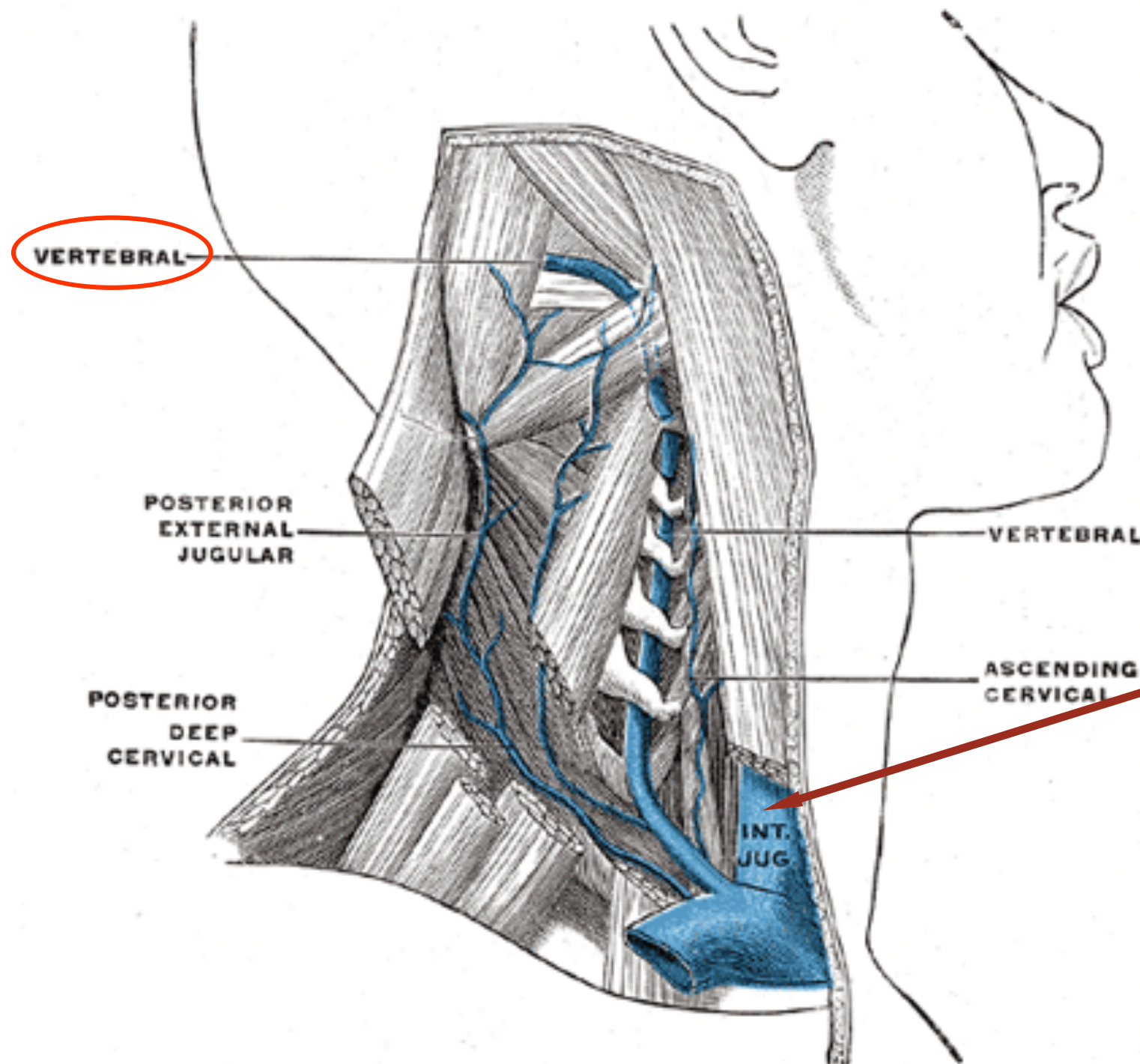
The superficial temporal vein unites with the maxillary vein in the substance of the parotid gland to form the retromandibular vein.



The posterior auricular vein unites with the *posterior division of the retromandibular vein*, just below the parotid gland, to form the external jugular vein.



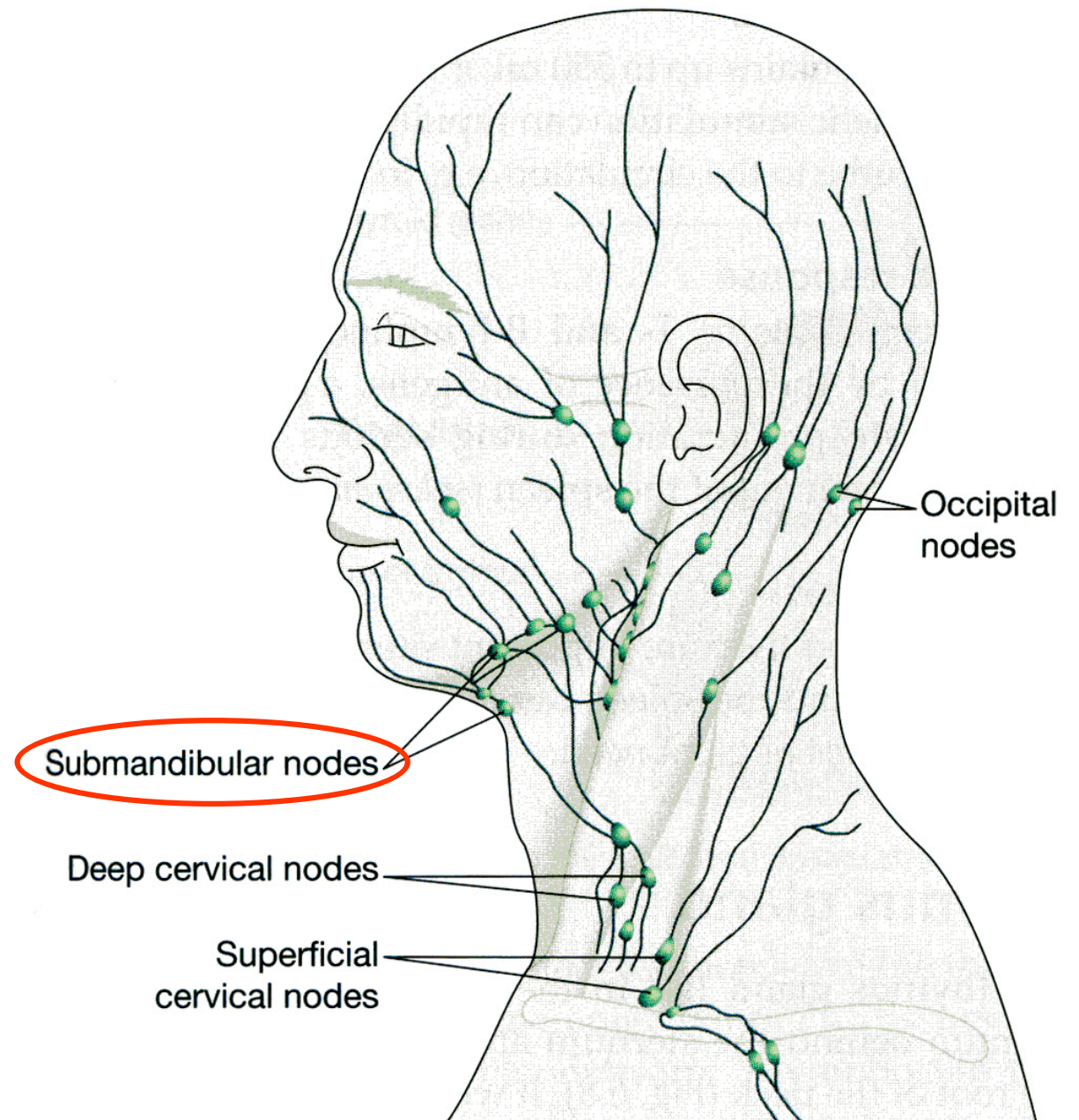
The occipital vein drains into the suboccipital venous plexus, which lies beneath the floor of the upper part of the posterior triangle.

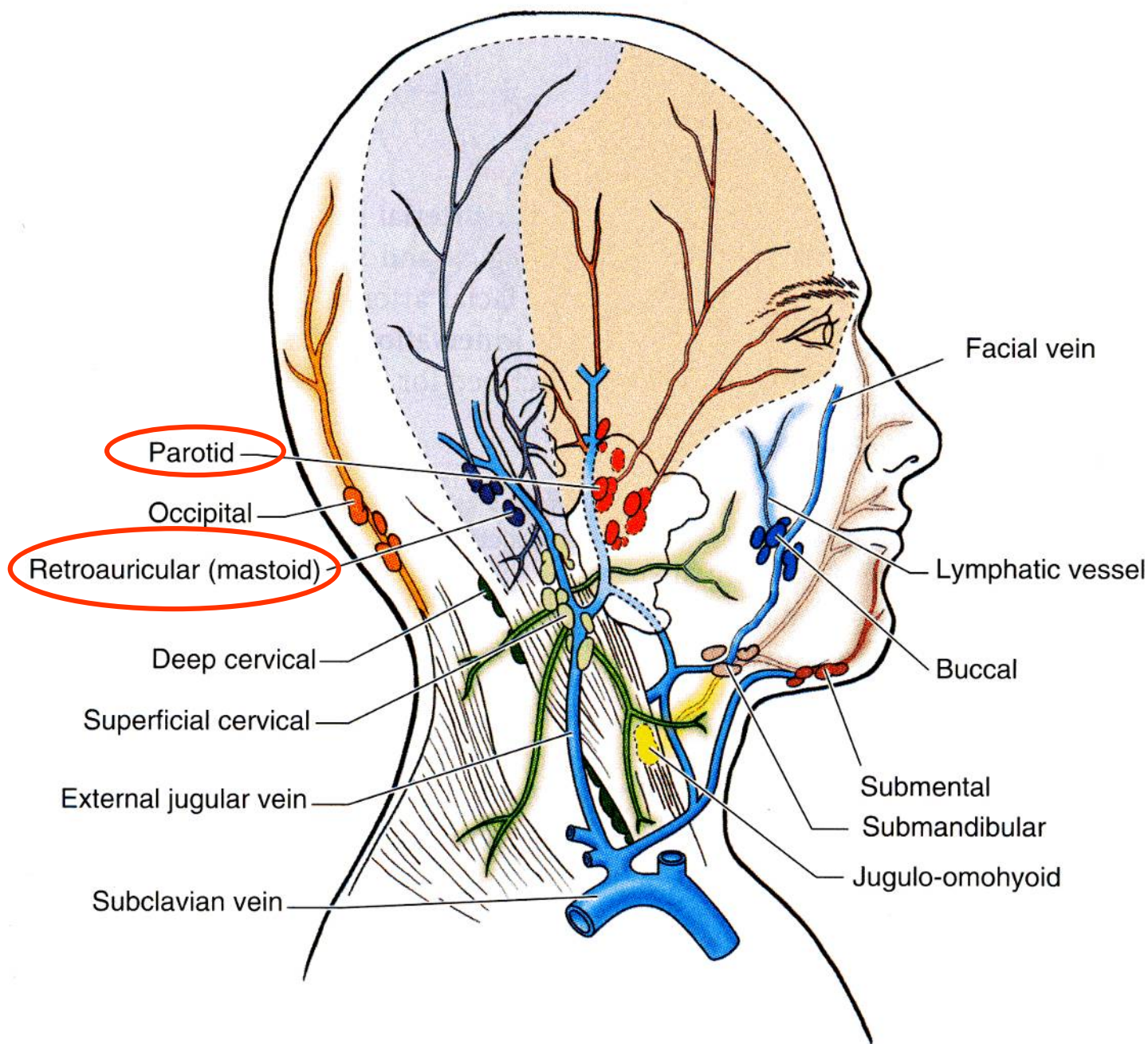


The suboccipital venous plexus in turn drains into the vertebral veins or **the internal jugular vein.**

LYMPH DRAINAGE OF THE SCALP

Lymph vessels in the anterior part of the scalp and forehead drain into the **submandibular lymph nodes**.





- Drainage from the lateral part of the scalp above the ear is into the **superficial parotid** (preauricular) nodes;
- lymph vessels in the part of the scalp above and behind the ear drain into the **mastoid** nodes.

- Vessels in the back of the scalp drain into the **occipital** nodes.
- All these groups of lymph nodes are drained into the **deep cervical group** of lymph nodes.

