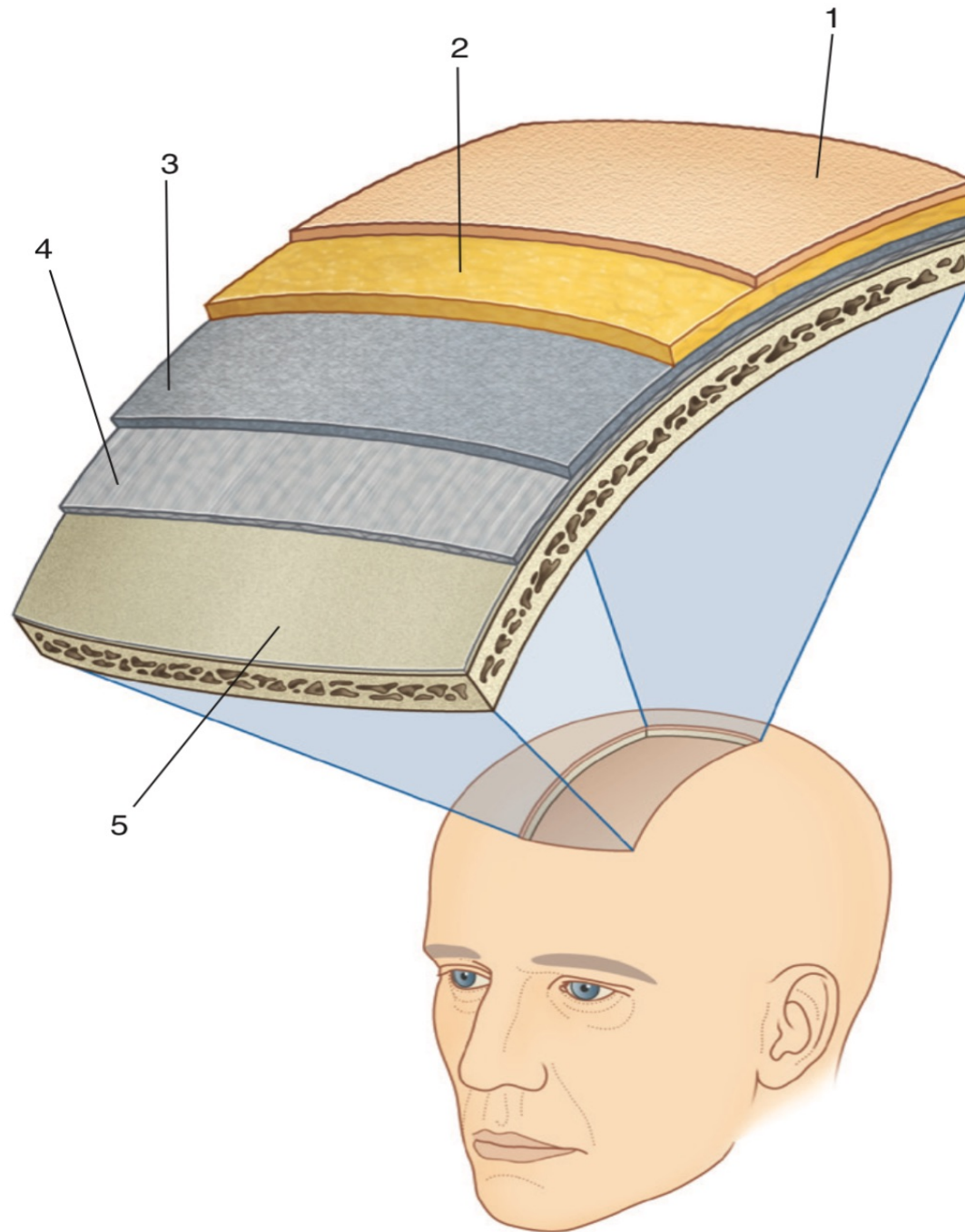


Identify the indicated layers of the scalp.



1. Skin
2. Connective tissue
3. Aponeurotic
4. Loose Areolar tissue
5. Pericranium

In the Clinic

- The first three layers of the scalp form a single unit. This unit is sometimes referred to as the scalp proper and is the tissue torn away during serious scalping injuries.
- When the scalp is cut, the dense connective tissue surrounding the vessels tends to hold the cut vessels open. This results in profuse bleeding.
- Because of the consistency of the loose connective tissue, infections tend to localize and spread through this layer.

Sensory nerve supply of the Scalp

Identify the indicated branches of the trigeminal nerve or the nerve supply to the area indicated in this lateral view of the face and neck.

→ The 5th cranial nerve

- gives sensory branches anteriorly

Anterior half

vertex

Posterior half

Branches of
Cervical Plexus

③ Zygomaticotemporal
- hairless area of the temple

① Supratrochlear N.

(Skin of the forehead)

② Supraorbital N.
↳ Skin of the forehead
- up to the vertex

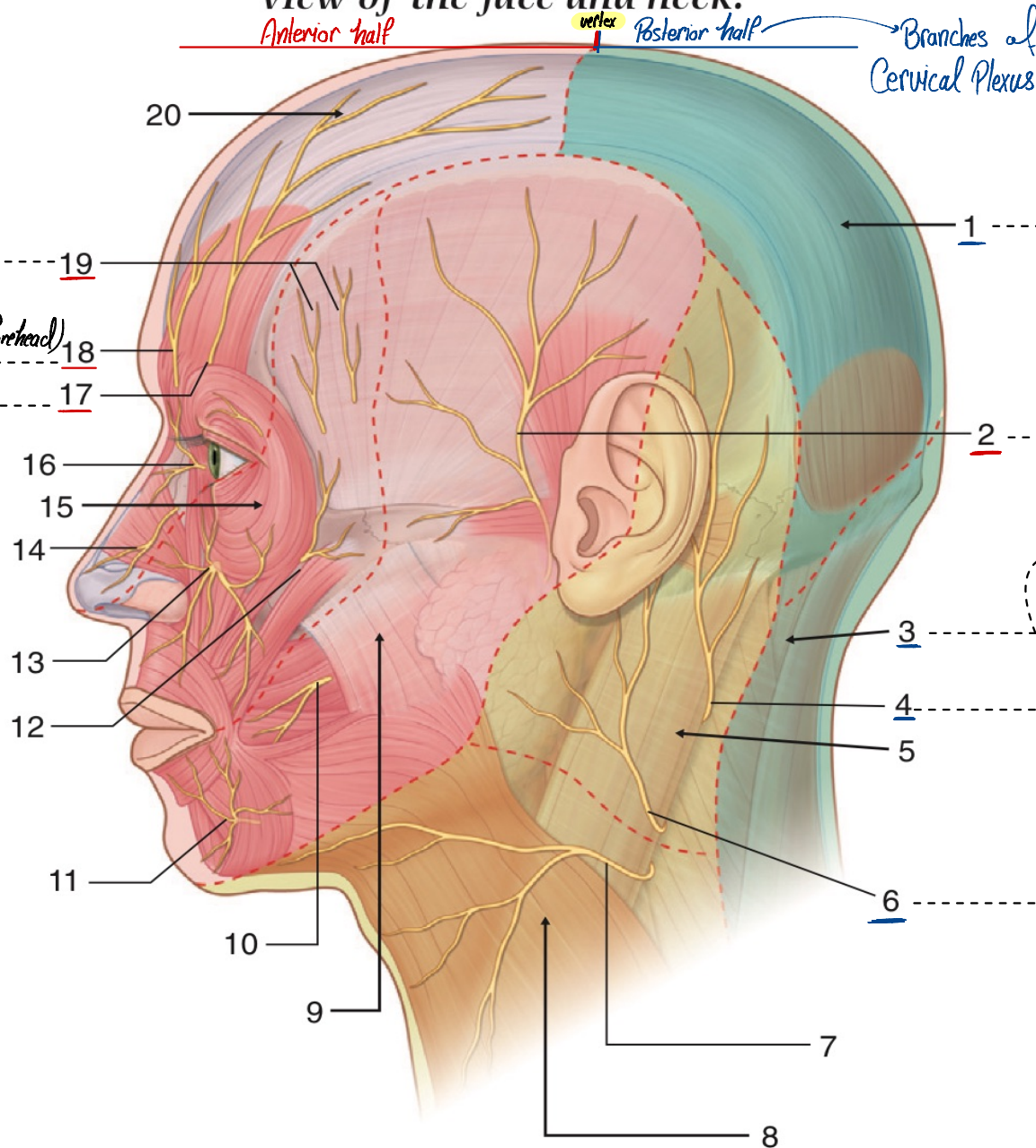
③ Greater Occipital N. (C₂, dorsal ramus)
- Supplies the occipital scalp up to the vertex.

④ Auriculotemporal
(hairy area of the skin).

⑤ Third Occipital N. (C₃, dorsal ramus)
- Skin of the lower occipital region.

② Lesser Occipital N. (C₂)
- Scalp behind the auricle

① Great auricular N. (C_{2,3})
- Skin over mastoid process



Blood supply of the Scalp

- Anterior - Posterior - ECA: External Carotid Artery

Ignore the veins (Blue vessels).
(actually they have the same names as arteries but anyway).

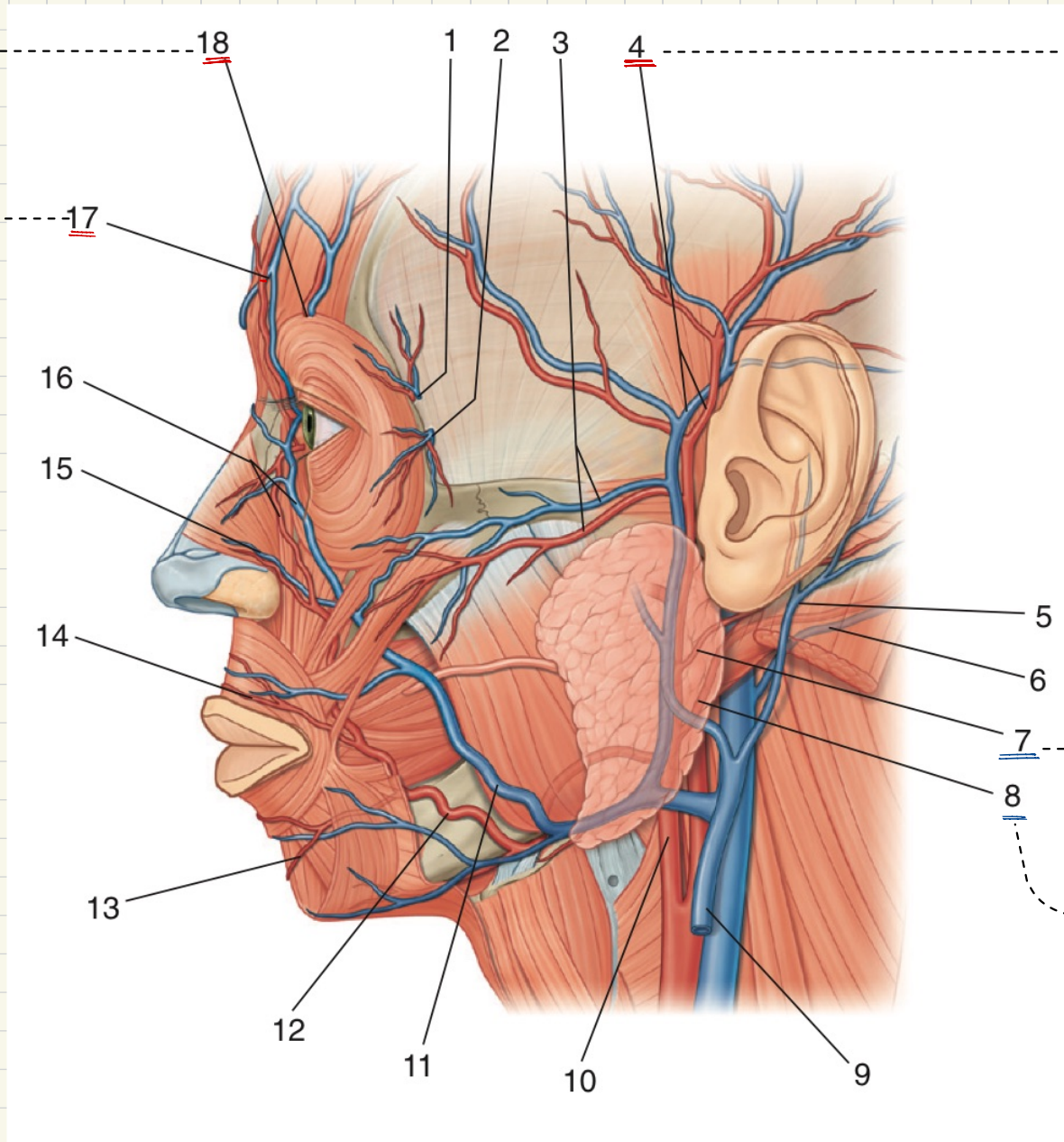
Supra-orbital branch of
ophthalmic artery

Supratrochlear branch of
ophthalmic artery

Superficial temporal branch
of ECA

Posterior auricular branch of ECA

Occipital branch of ECA



Identify the indicated facial muscles.

- Large muscle.
- Small muscle

Frontal belly of occipitofrontalis
(supplied by temporal branch of the facial N.)

* A scalp's muscle

① Orbicularis oculi
(orbital part, palpebral part, lacrimal part)

Levator labii superioris

Zygomaticus minor

Zygomaticus major

② Orbicularis oris

Depressor labii inferioris

Mentalis

Depressor anguli oris

Risorius

③ Buccinator

Platysma

→ supplied by the Cervical branch of the facial N. (within parotid).

① Orbicularis oculi

- Orbital part: Closes the eye tightly
- Palpebral part: blinking reflex.
- Lacrimal part: Control the flow of tears
- Nerve supply: Temporal & Zygomatic branches of facial N. (within the parotid gland)

② Orbicularis oris

- encircles the mouth
- arise from: maxilla, mandible, & molars
- Insertion: Subcutaneous tissue of the lips.
Closes the vestibule of the mouth →
- Supplied by Buccal branch of the facial N. (within parotid)

③ Buccinator

- Compresses the cheeks & lips against the teeth
→ prevents accumulation of food in the vestibule
- Supplied by Buccal branch of the facial N. (within parotid)

* Muscle of the scalp

→ Occipital belly of occipitofrontalis muscle.
↳ nerve supply: Posterior auricular branch of the facial nerve (below styloid foramen).

IN THE CLINIC:

All muscles of facial expressions are innervated by the facial nerve (VII). The complexity of the facial nerve (VII) is demonstrated by the different pathologic processes and sites at which these processes occur.

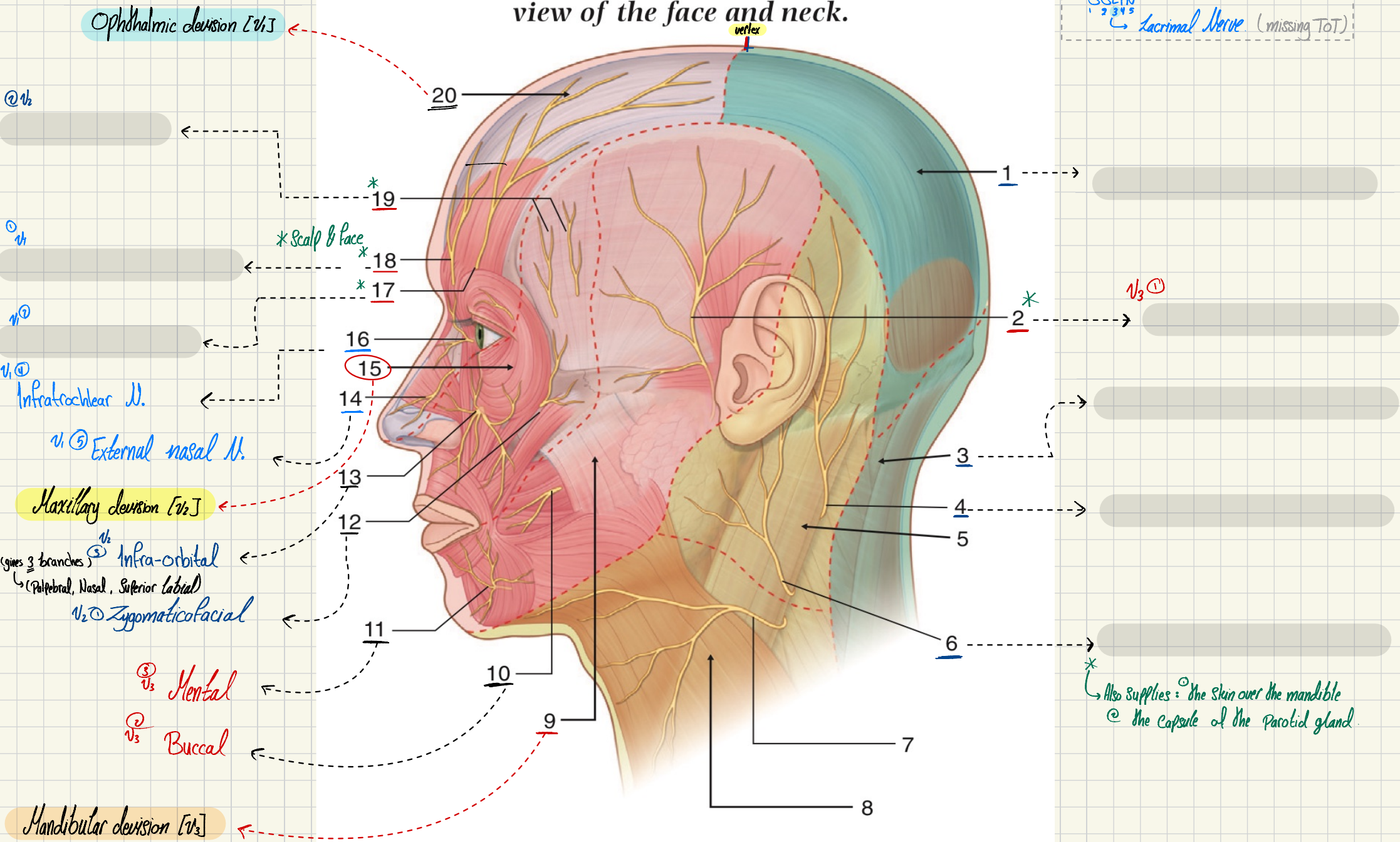
Sensory nerve supply of the Face

Identify the Scalp's nerve supply :)

Identify the indicated branches of the trigeminal nerve or the nerve supply to the area indicated in this lateral view of the face and neck.

→ The 5th cranial nerve

- Ophthalmic nerve
SSLIN
1 2 3 4 5
→ Lacrimal Nerve (missing ToT)



Blood supply of the Face

Identify the Scalp's blood supply :)

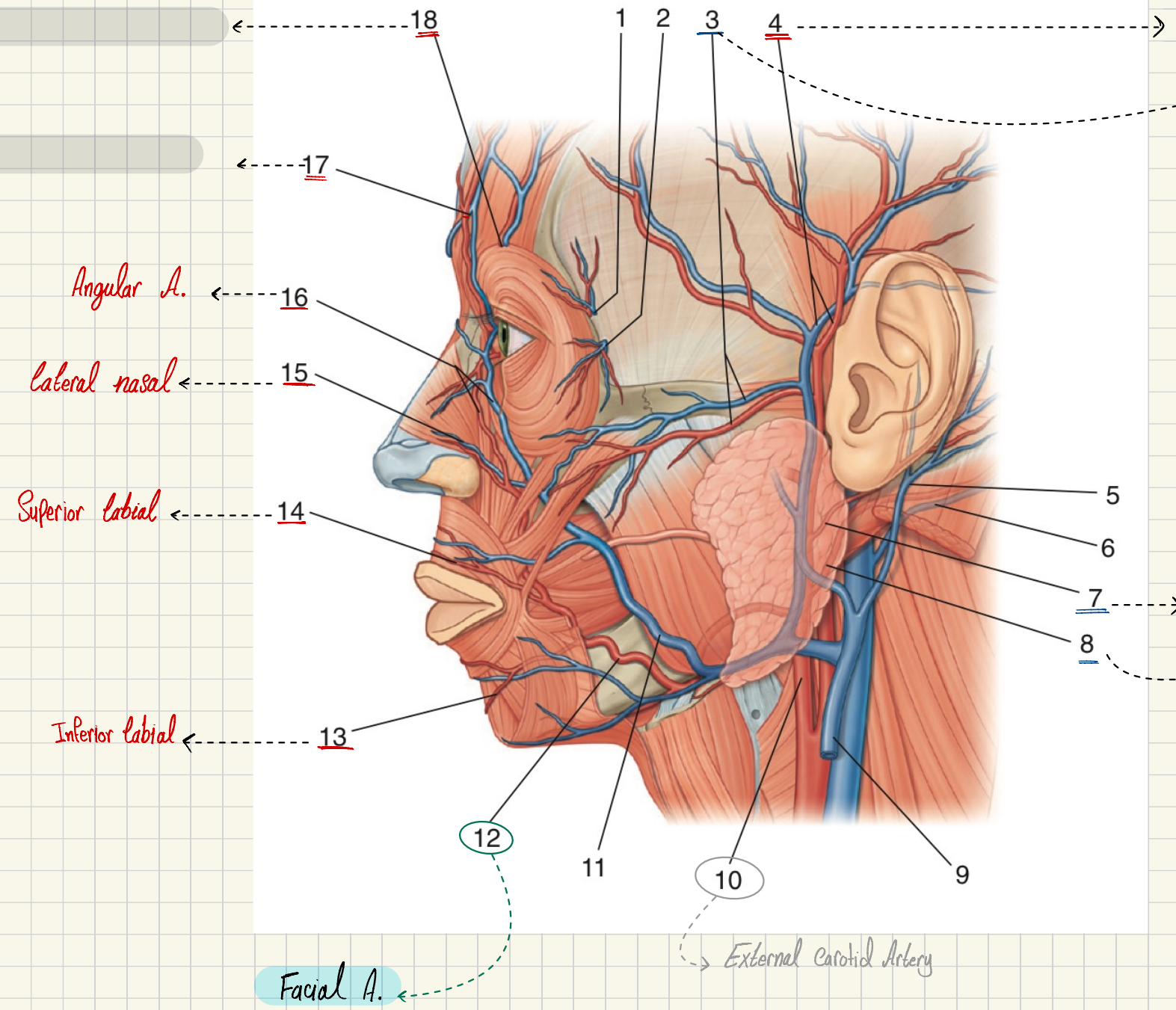
Facial artery
Superficial Temporal artery

ECA: External Carotid Artery

Scalp & Face.

Branches of Transverse facial A.

2. Parotid branch
3. Anterior auricular branches
4. Zygomatico-orbital A.
5. Middle temporal A.
6. Frontal branch
7. Parietal branch



Facial A.

External Carotid Artery

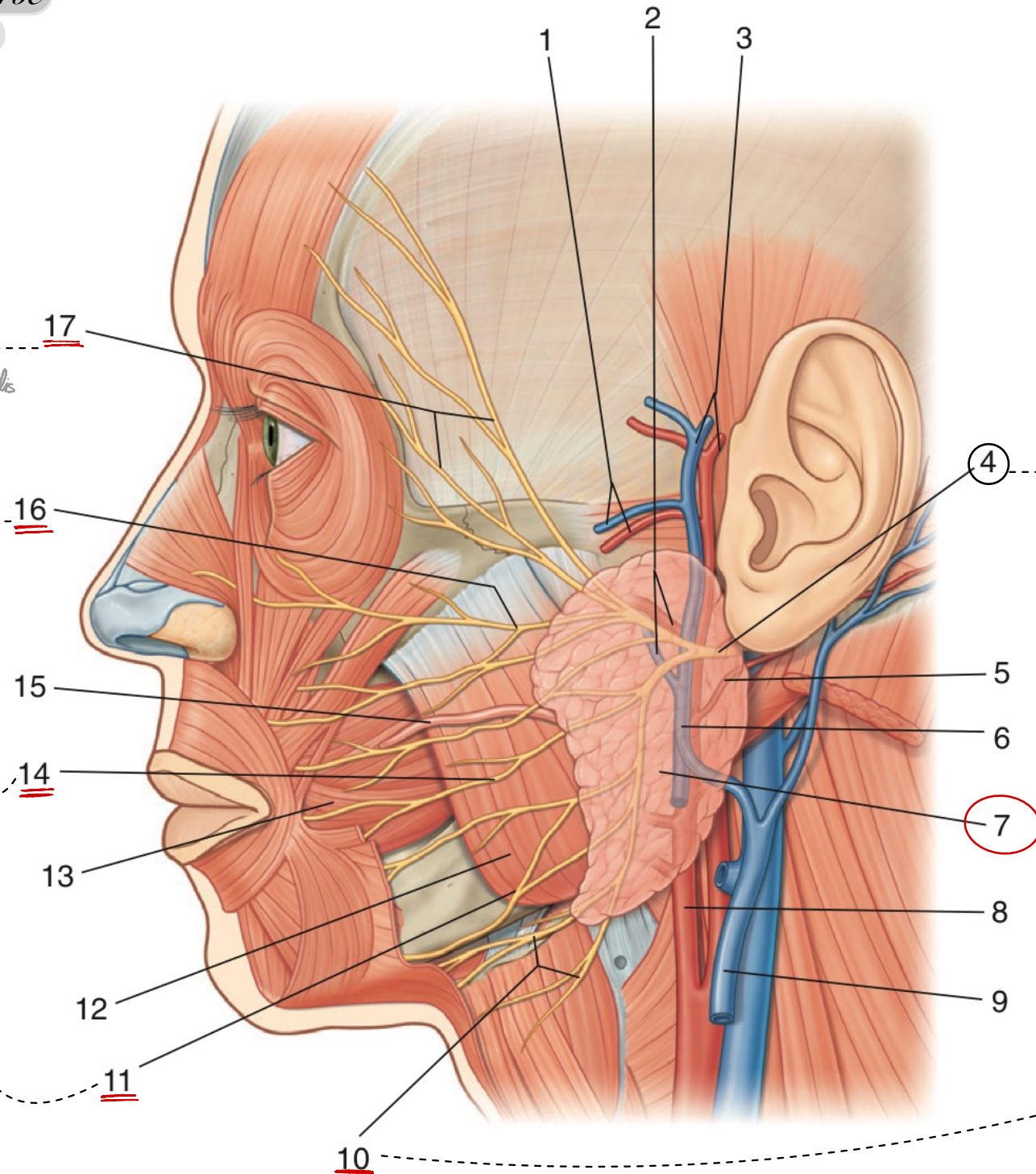
*Branches of the facial nerve
within the parotid gland*

① *Temporal branch* ← 17
Supplies: ① Frontal belly of occipitofrontalis
② Orbicularis oculi

Zygomatic branch ← 16
Supplies: Orbicularis oculi

Buccal branch ← 14
Supplies: ① Orbicularis oris
② Buccinator
③ Elevators of the upper lip

Marginal Mandibular branch ← 11
Supplies: muscles of the lower lip



Facial Nerve

Parotid gland

Cervical branch
Supplies: Platysma muscle

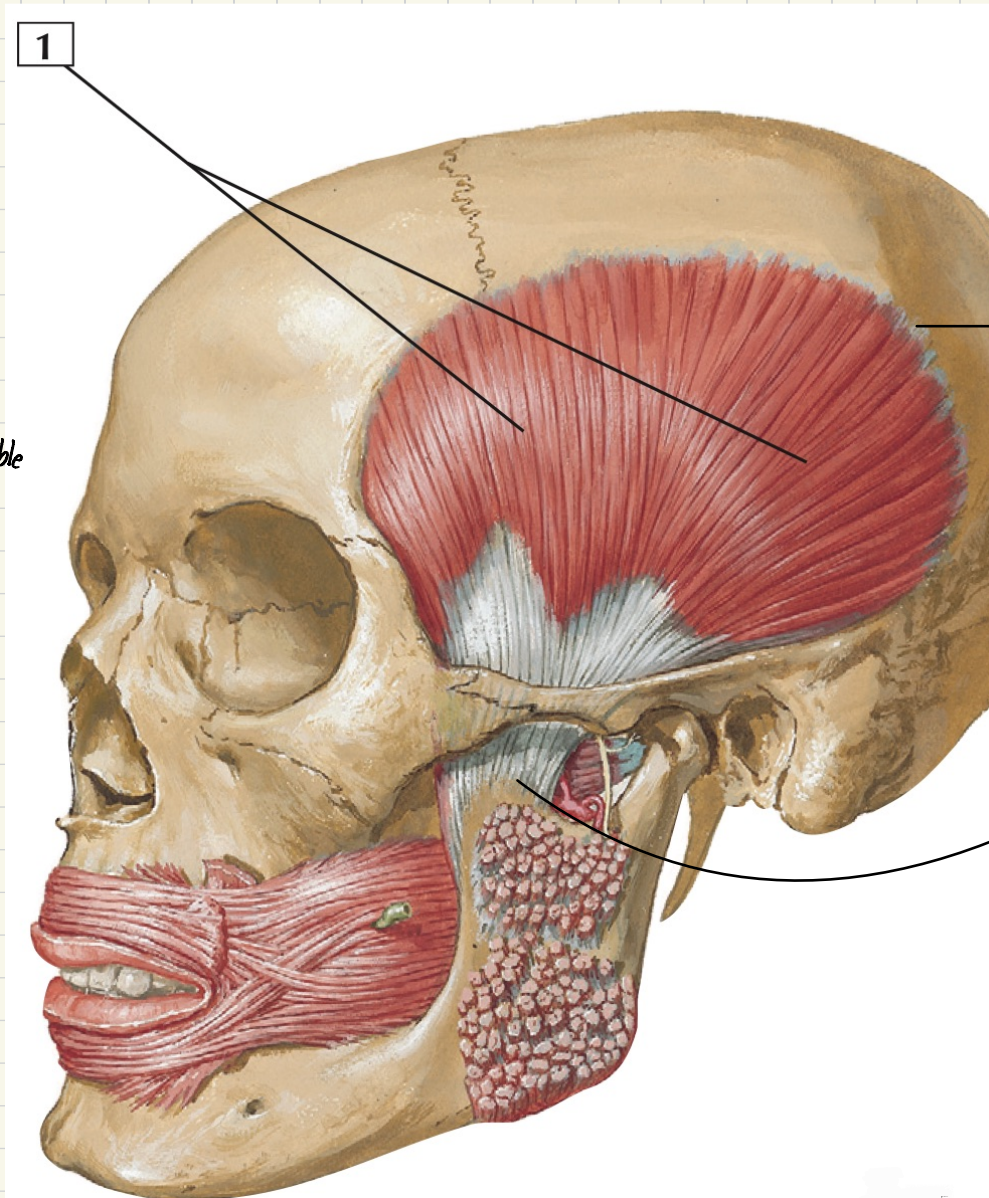
Muscles of mastication :

Temporalis

Innervation: Ant. mandibular division of the Trigeminal nerve

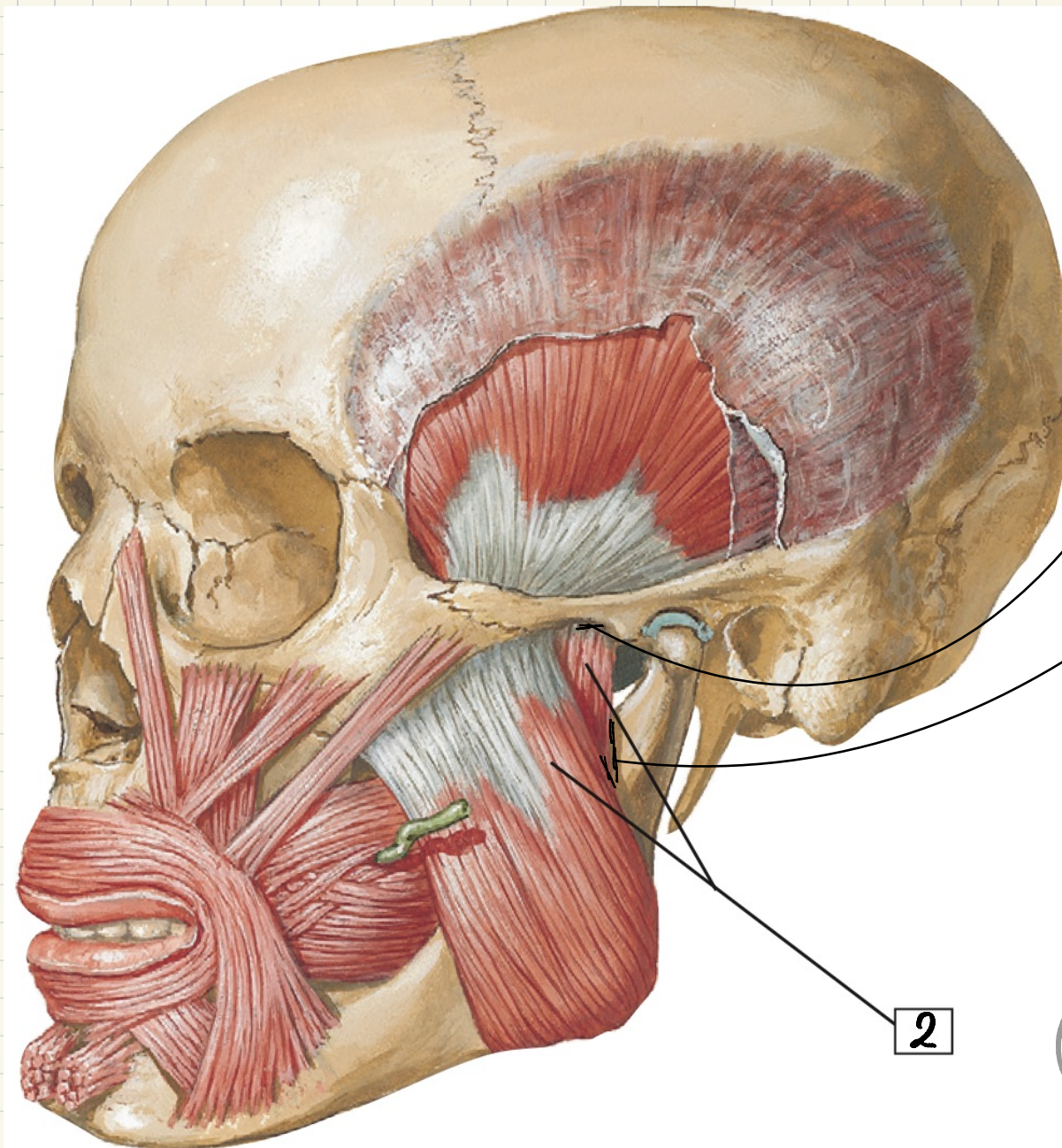
Action: Closing the mouth

Anterior & superior fibers : elevate the mandible
Posterior fibers : retrusion
(retract the protruded mandible).



→ **Origin:** floor of temporal fossa & temporal fascia.

→ **Insertion:** - Coronoid Process of the mandible &
- anterior border of the mandibular ramus
down to the last molar teeth.



- **Innervation:** Int. mandibular division of trigeminal nerve

- **Action:** - elevate the mandible to close the mouth
- Plays a role in biting & chewing.

→ **Origin:** inner surface & lower border of zygomatic arch.

→ **Insertion:** outer surface of mandibular ramus

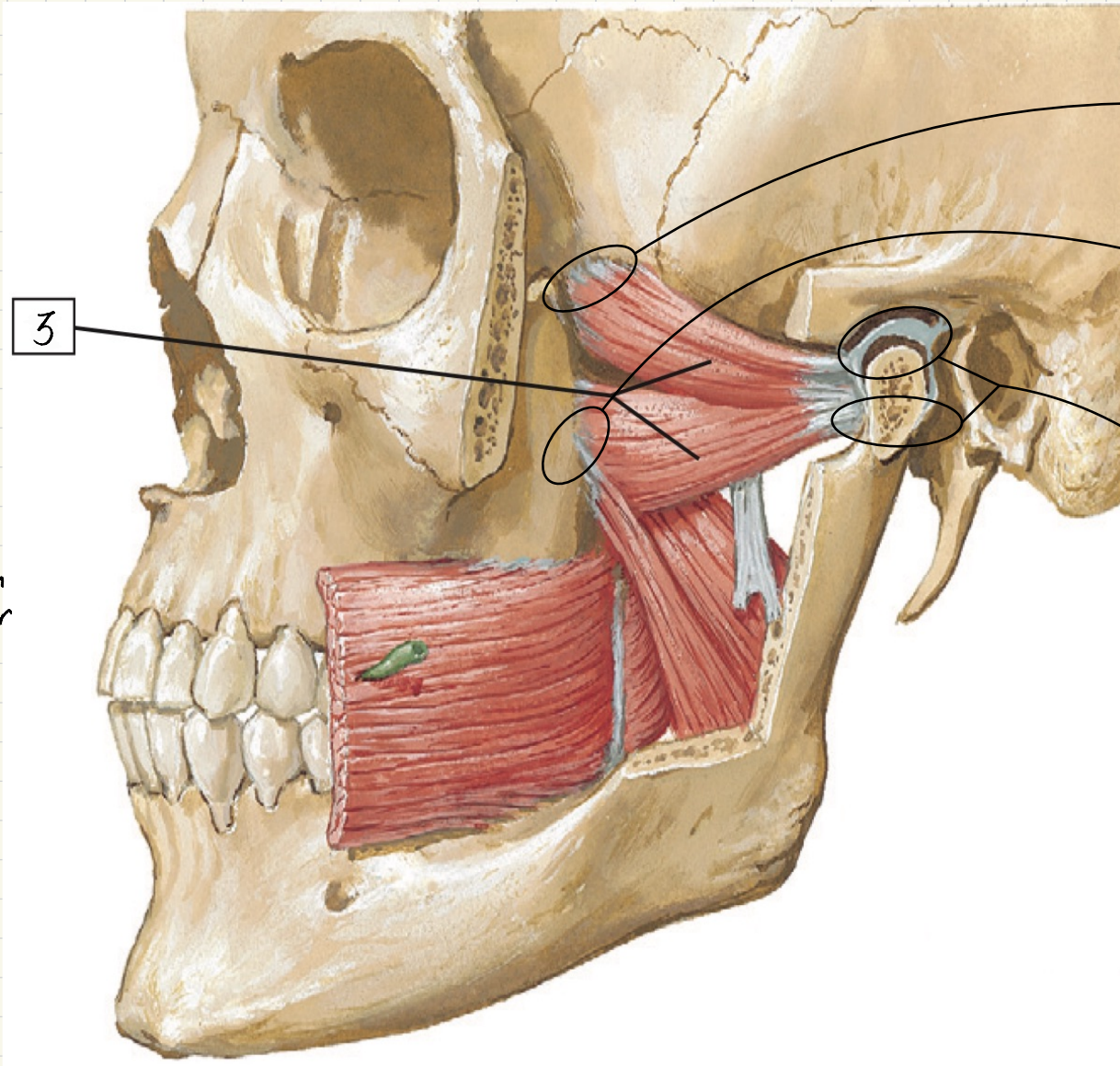
2

Masseter

Lateral Pterygoid

- **Innervation:** Ant. mandibular division of trigeminal nerve.

- **Action:** The main opener of the mouth by: forward pull of the mandibular condyle & disc.



→ Upper head

- **Origin:** Infratemporal surface of the greater sphenoid wing.

→ Lower head:

- **Origin:** lateral surface of the lateral pterygoid plate

→ **Insertion:**

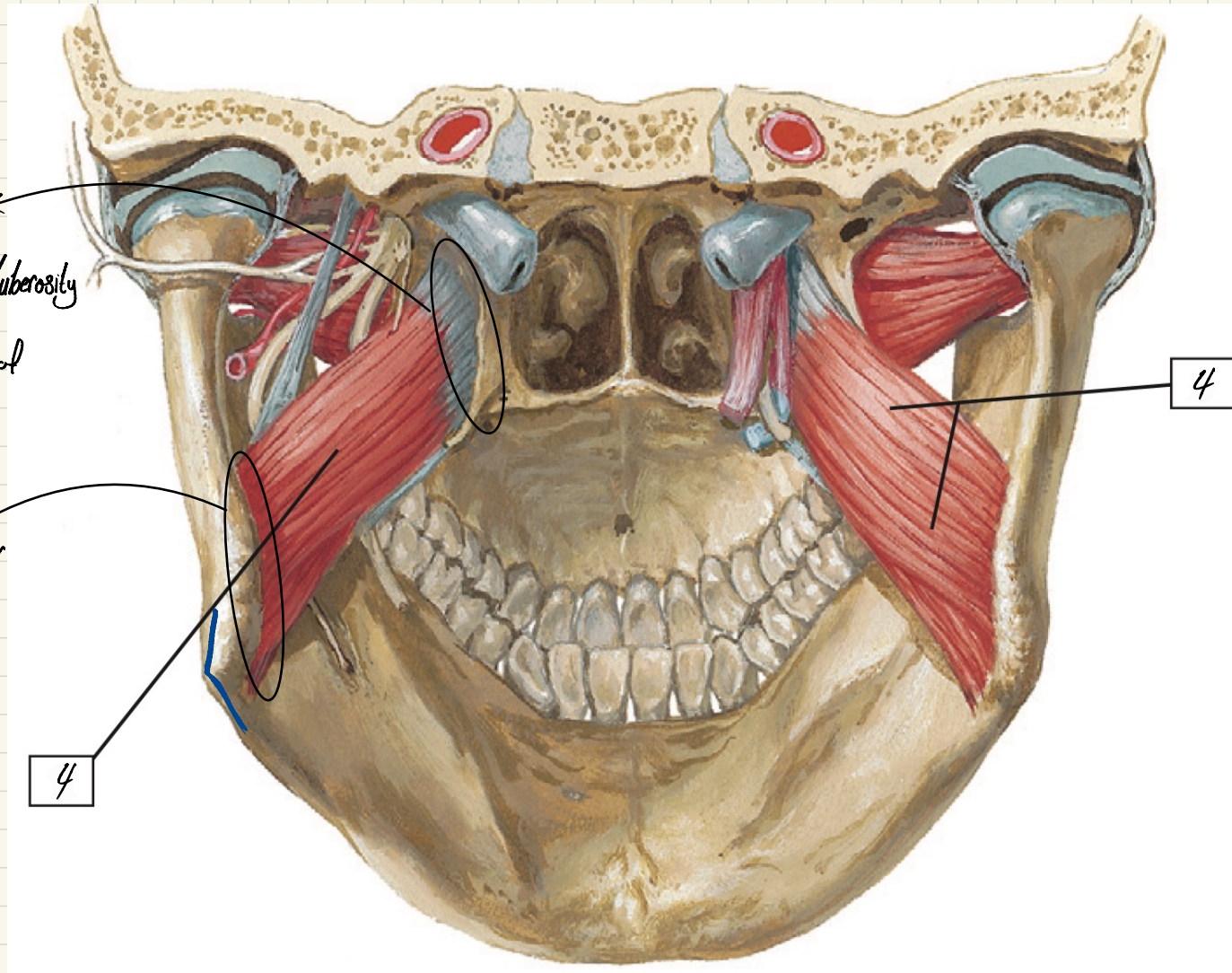
- The capsule & the articular disc of TMJ
- The front of the neck of the mandible

Posterior view:

Origin:

- Superficial head: Maxillary tuberosity
- Deep head: medial surface of the lateral pterygoid plate.

Insertion: lower part of the medial surface of mandibular ramus - Angle of the mandible.

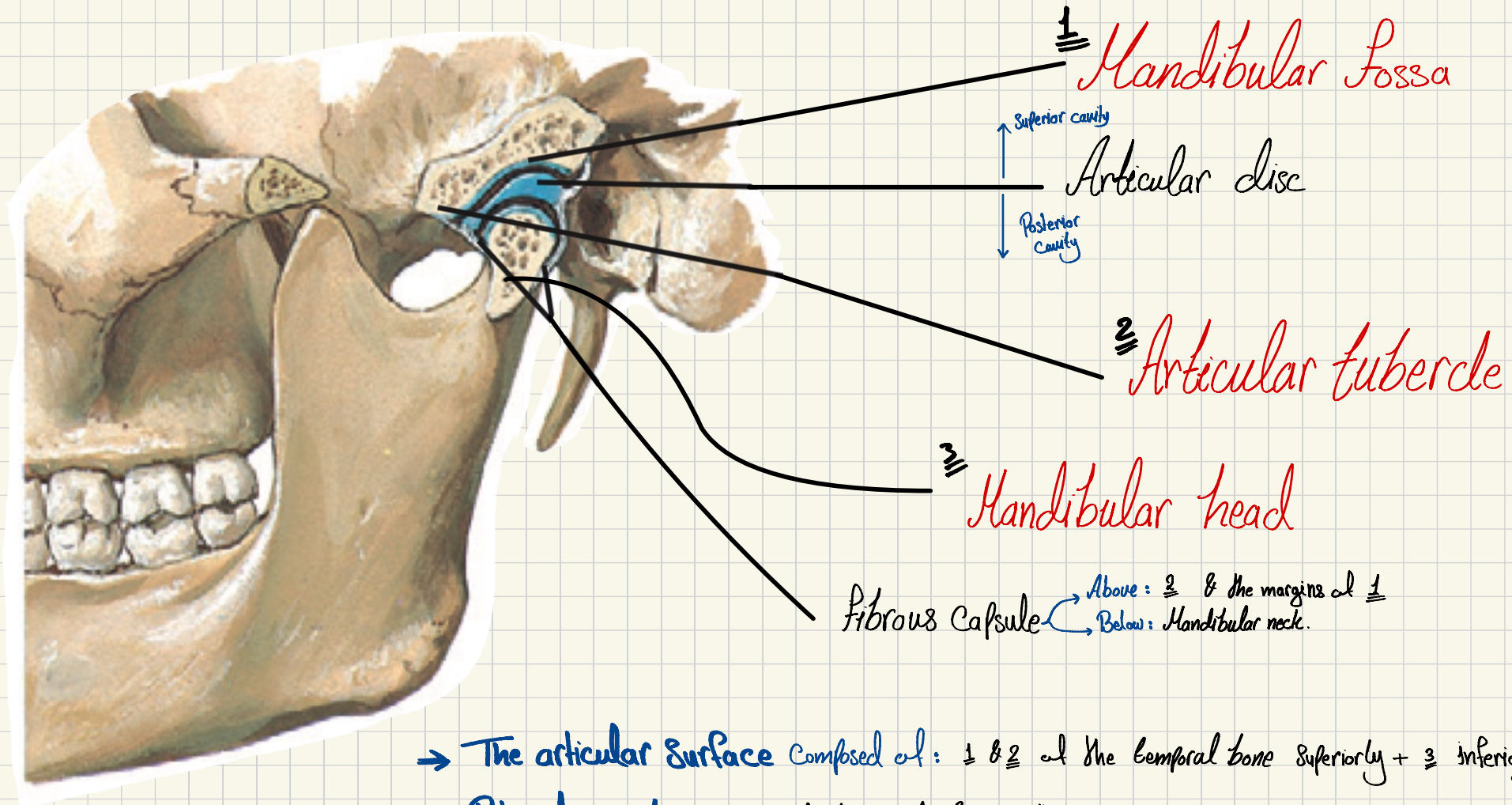


Medial Pterygoid

- **Innervation:** trunk of the mandibular N.

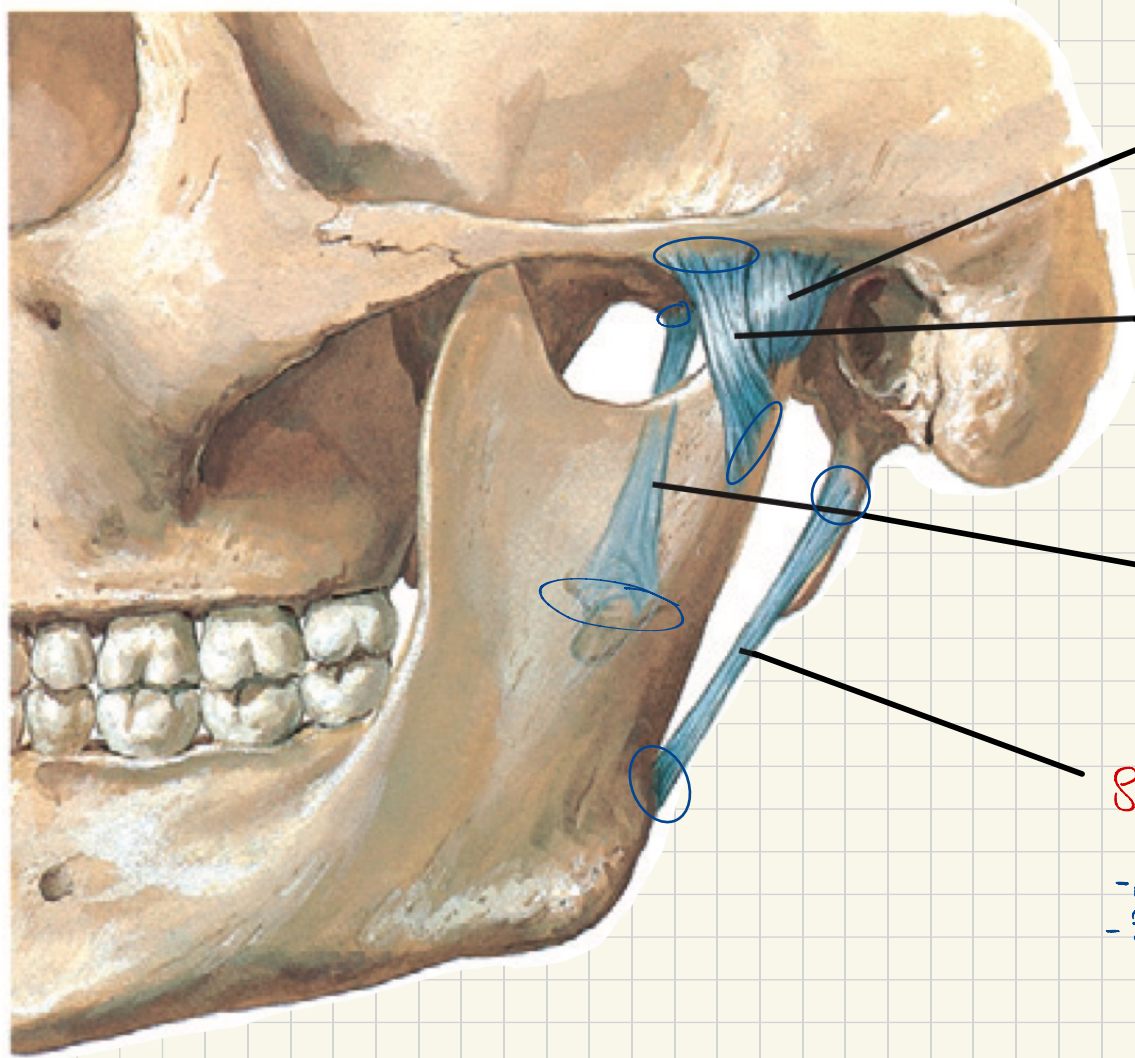
- **Action:** (with masseter)
elevate & close the mandible

Tempomandibular joint



Jaw Closed

- The articular surface composed of: 1 & 2 of the temporal bone superiorly + 3 inferiorly.
- Blood supply: Superficial temporal & maxillary arteries
- Nerve supply: Auriculotemporal & masseteric nerves



Fibrous capsule

Lateral Tempomandibular ligament

- Above: The root of the zygomatic arch
- Below: Lateral side of mandibular neck.

Prevents posterior dislocation of the joint.

Sphenomandibular ligament

- Above: Spine of the sphenoid
- Below: The lingula of the mandible

Supports the weight of the jaw

Stylomandibular Ligament.

- Above: The tip of the styloid process
- Below: The angle and posterior border of the mandible

Mandibular Nerve

- Trunk - Ant. - Post.

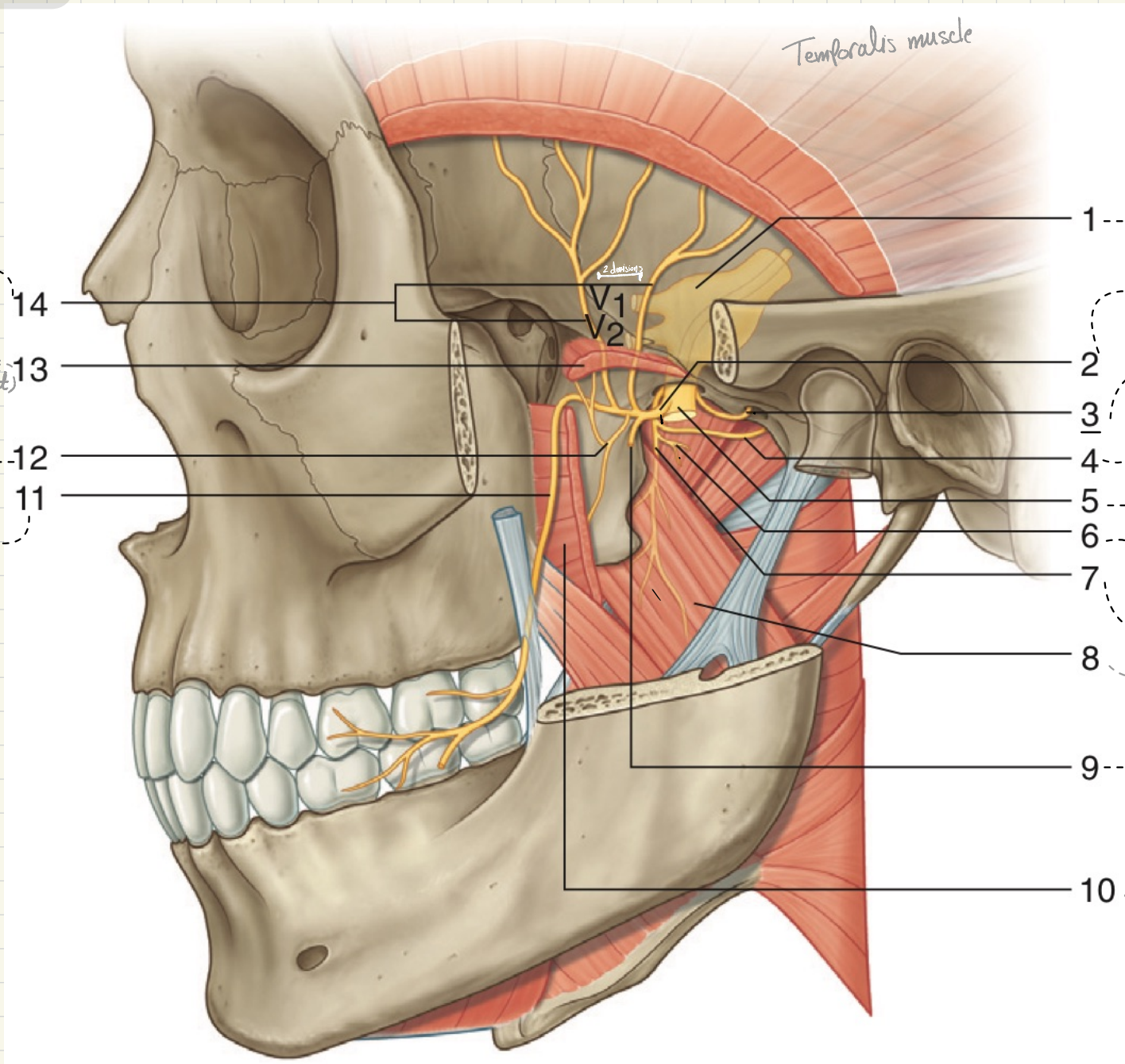
Deep temporal nerve

Upper head lateral pterygoid (cut)

Nerve to lateral pterygoid

Buccal nerve (sensory)

Temporalis muscle



1 ---> Trigeminal ganglion

2 ---> Anterior trunk of mandibular N.

3 ---> Nervous spinosus (meningial N.)

4 ---> Branch to tensor tympani

5 ---> Posterior trunk of mandibular N.

6 ---> Branch to tensor palati

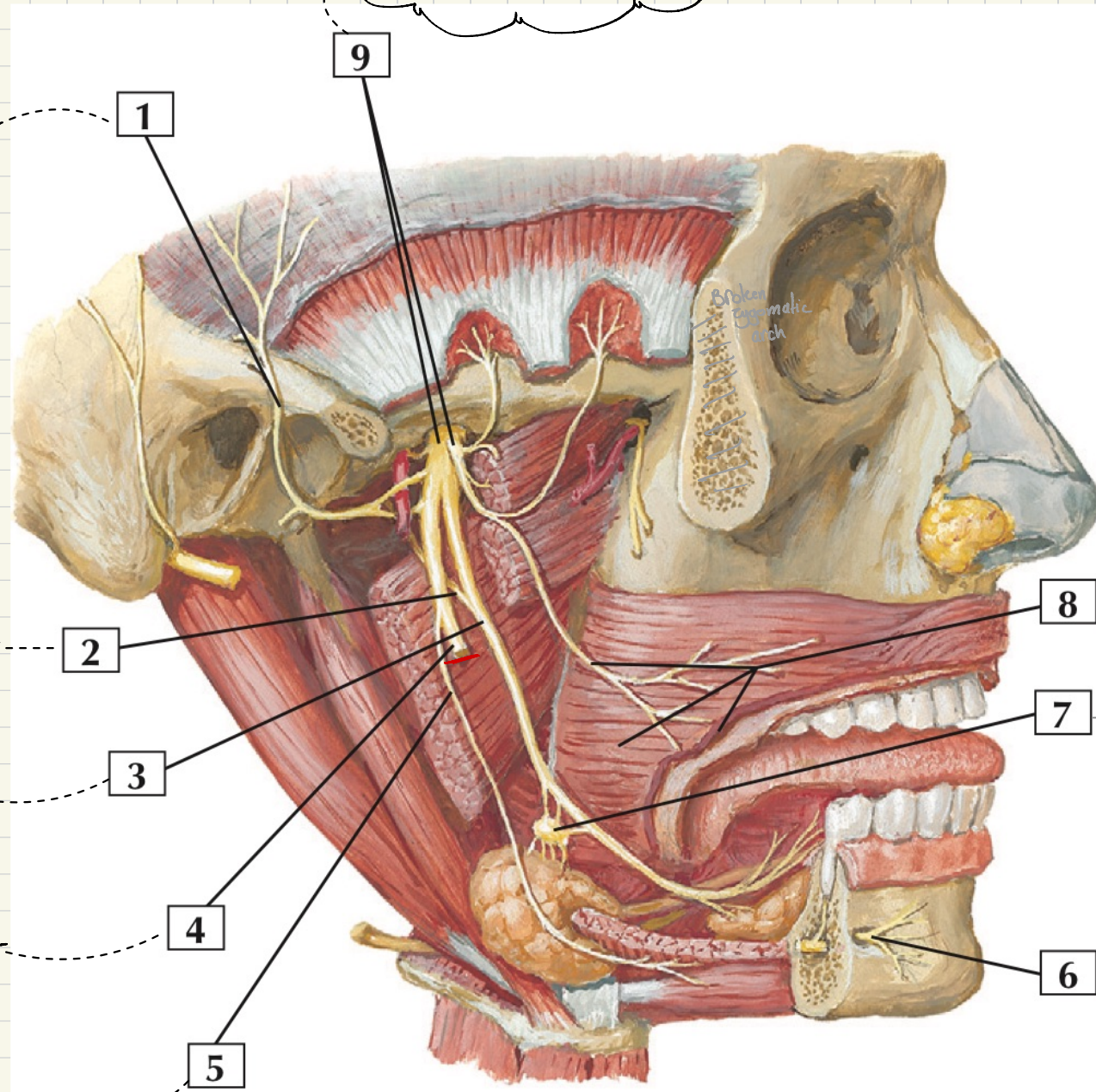
7 ---> Nerve to medial pterygoid

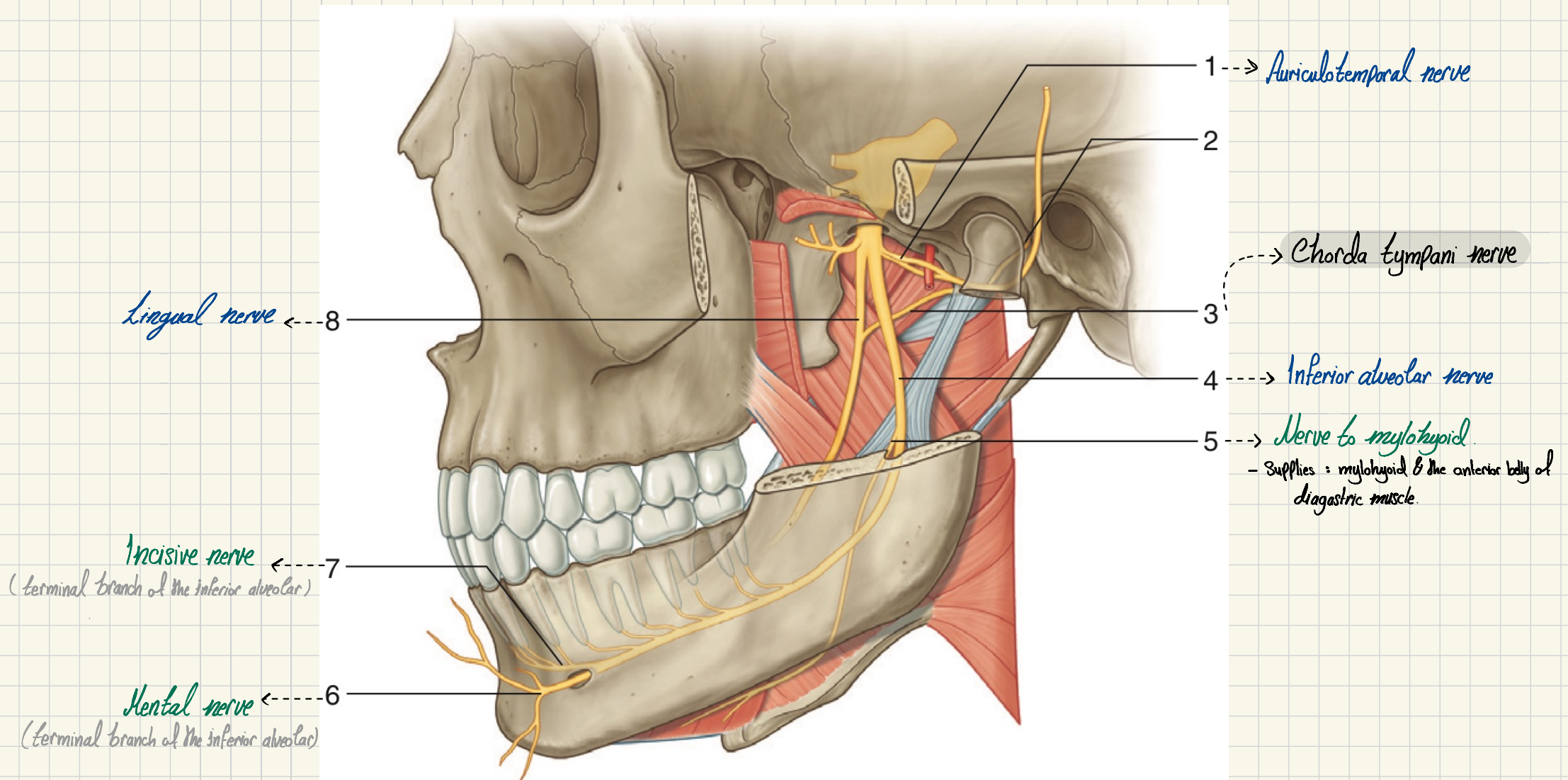
8 ---> Deep head of medial pterygoid

9 ---> Masseteric nerve

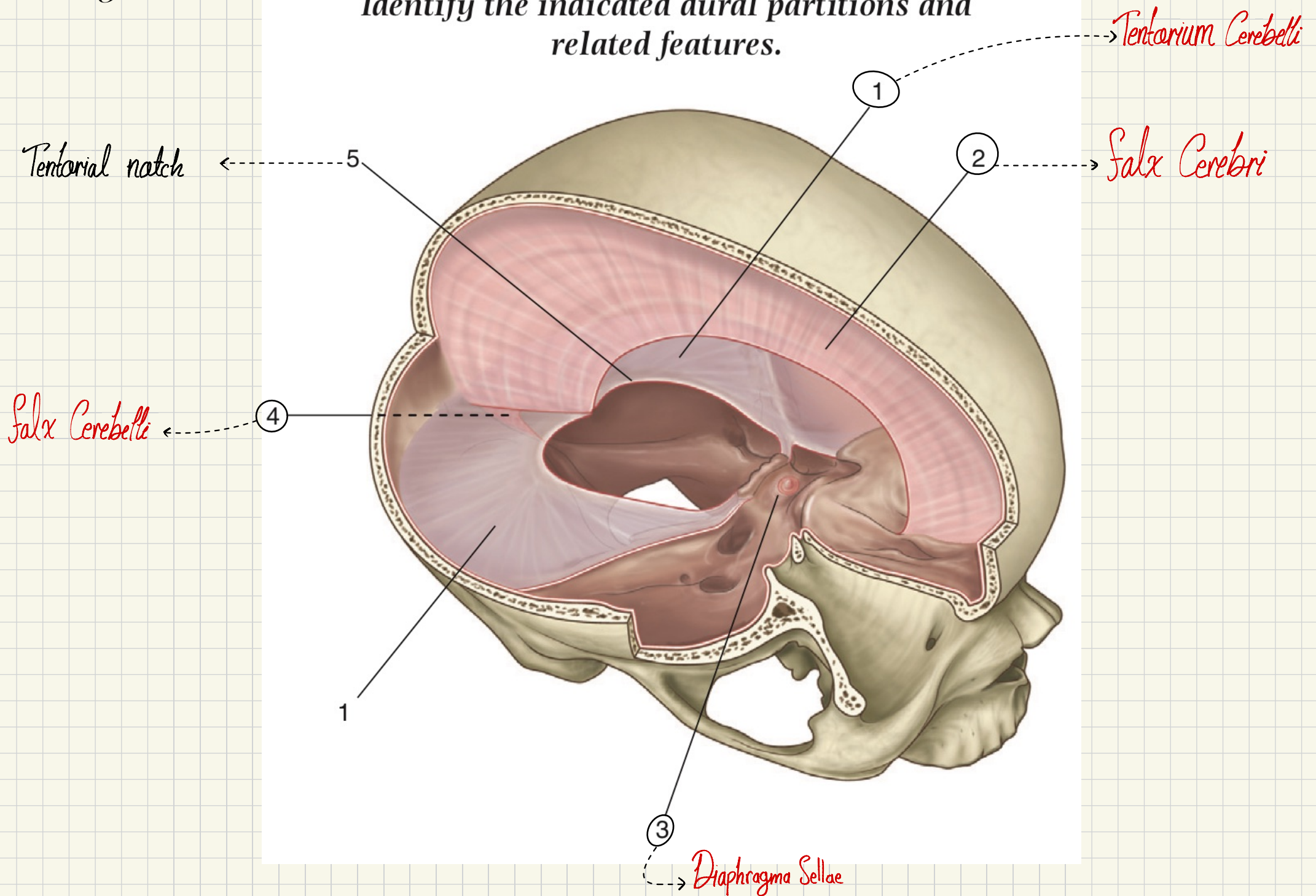
10 ---> Lower head lateral pterygoid (cut)

Mandibular N.



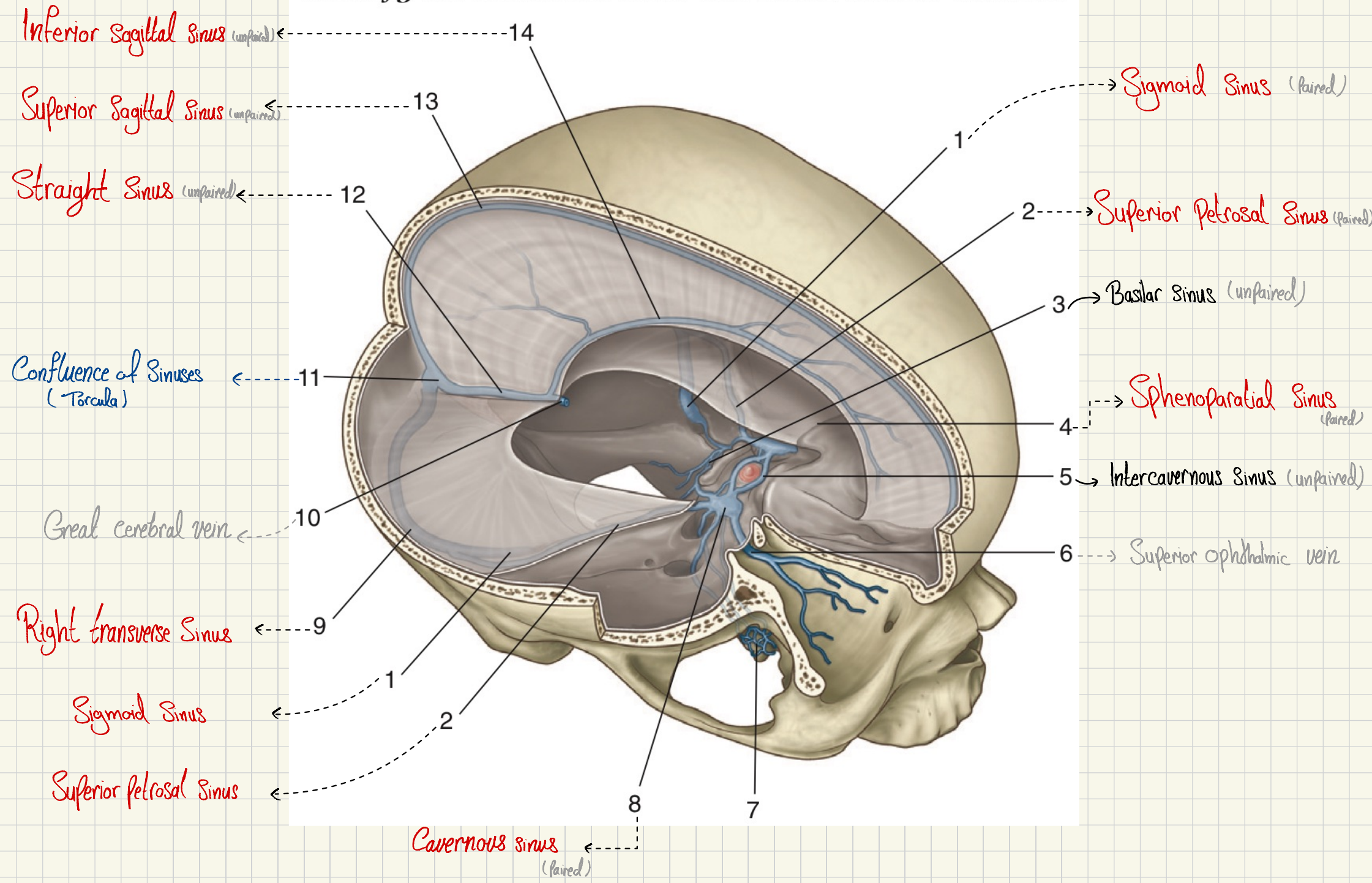


Identify the indicated dural partitions and related features.



Dural venous sinuses

Identify the indicated veins and dural venous sinuses.



Superficial cervical fascia

↳ thin layer of subcutaneous connective tissue

- **Nerve supply:** Cervical branch of facial nerve

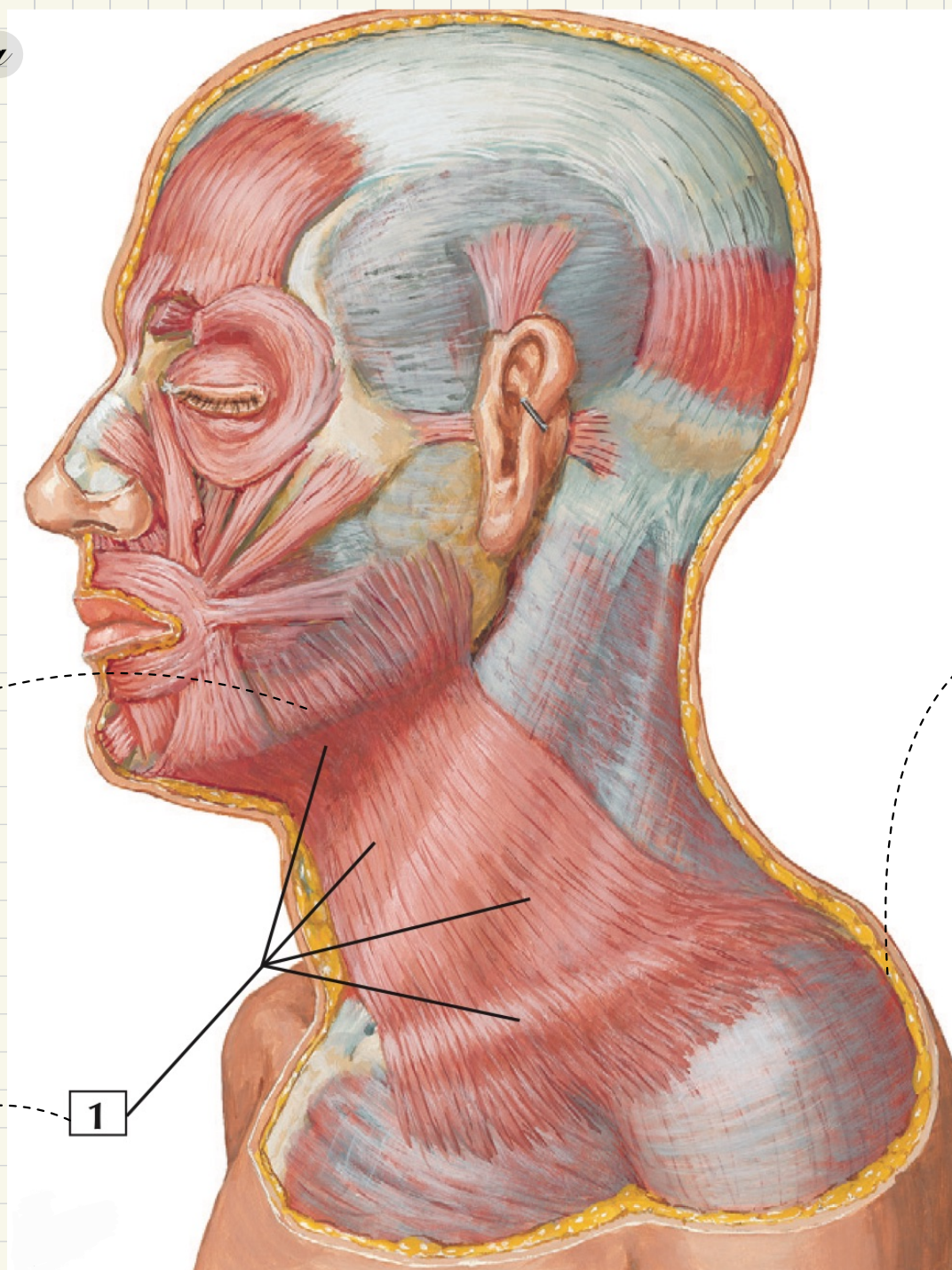
- **Action:** Depresses:
① mandible
② Angle of the mouth

Insertion: Body of the mandible

Origin: Skin and deep fascia over:
① Deltoid & ② Pectoralis major

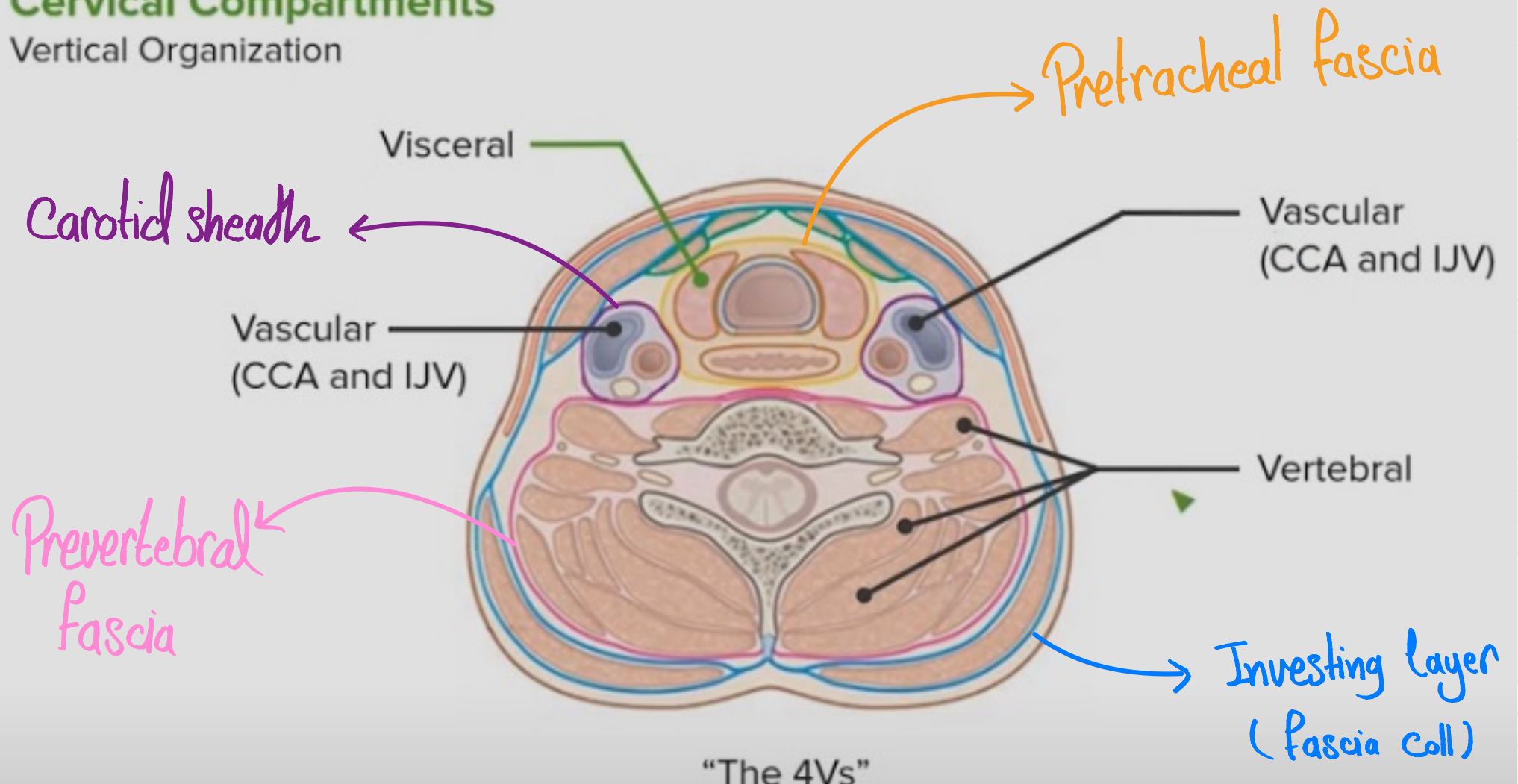
Platysma

1



Cervical Compartments

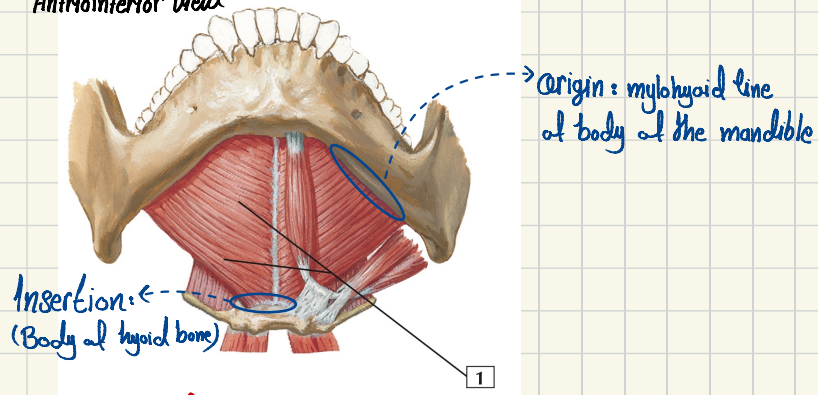
Vertical Organization



Supra-hyoid muscles --> **Action:**

- ① elevate the hyoid bone
- ② if fixed, depress the mandible

Anterior view



Mylohyoid

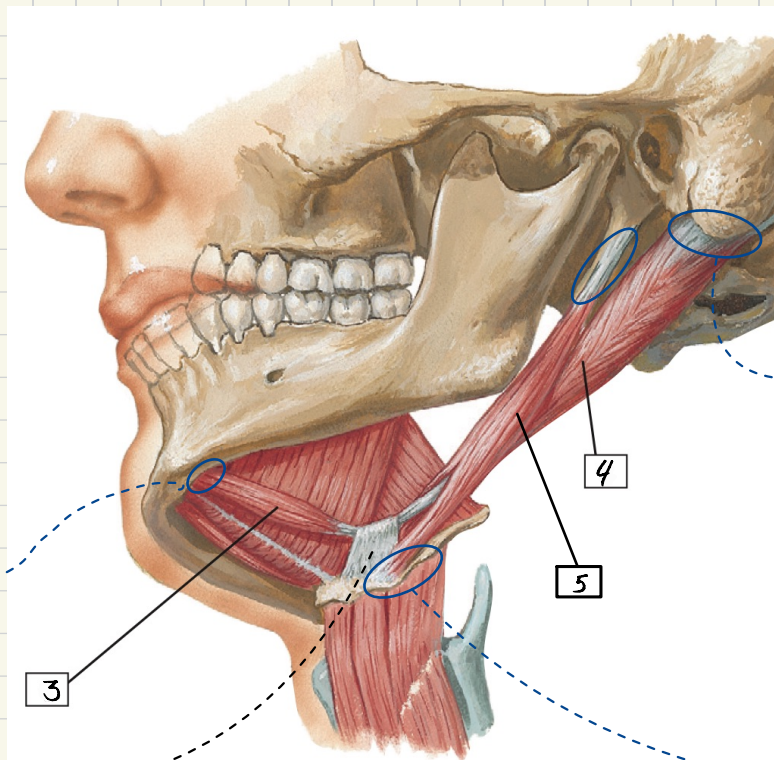
- Supplied by: Nerve to mylohyoid (Mandibular V.)

3. Anterior belly of digastric

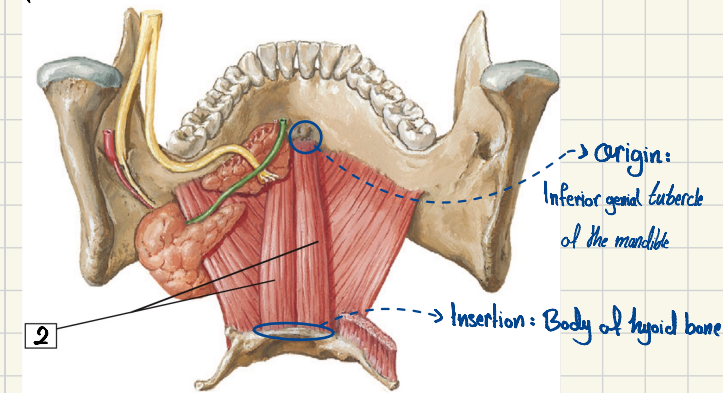
Origin: Digastric fossa of the mandible

- Supplied by: Nerve to mylohyoid (Mandibular V.)

Intermediate tendon



Posterior view:



Geniohyoid

- Supplied by: 1st Cervical nerve through hypoglossal nerve

4. Posterior belly of digastric

Origin: Mastoid Process

- Supplied by: Facial nerve

5. Stylohyoid

Origin: Styloid Process

- Inserted in the body of hyoid bone

- Supplied by: Facial nerve

Infra-hyoid muscles

Action:

- ① Sternohyoid → Depresses Larynx
- ② - All other muscles → Depress hyoid bone

Innervation:

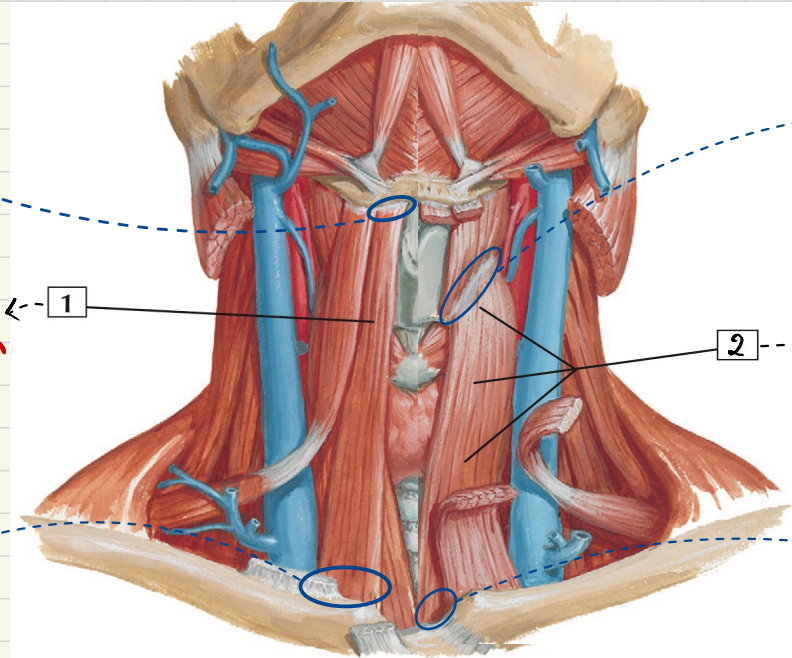
- ① Thyrohyoid : 1st cervical
- ② All other muscles : Ansa cervicalis ; C1, 2, 3

Insertion : Body of hyoid bone

Sternohyoid

1

Origin : Manubrium sterni



Insertion : Oblique line of thyroid cartilage

Sternohyoid

2

Origin : Manubrium sterni

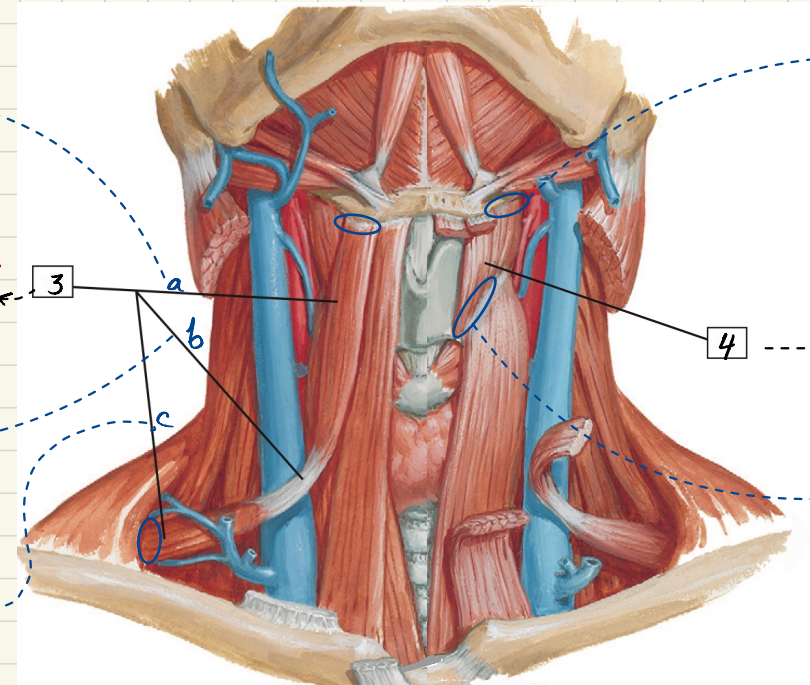
origin : lower border of body of hyoid bone ← Superior belly

Omothyoid

3

Insertion : intermediate tendon is held to clavicle

origin : upper margin of scapula ← Inferior belly



Insertion : Body of hyoid bone

Thyrohyoid

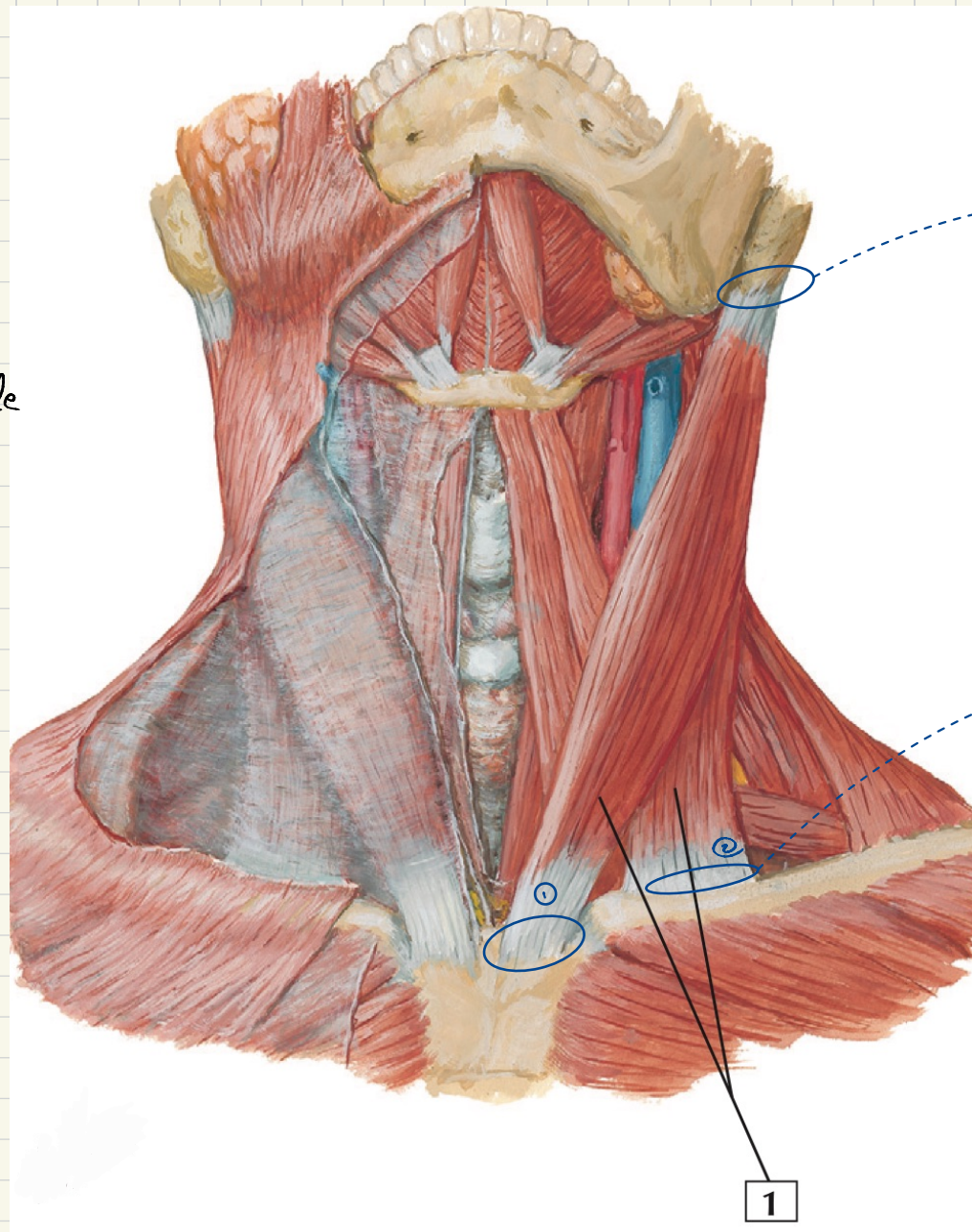
4

origin : oblique line of thyroid cartilage

Innervation: motor by spinal part
of accessory nerve

- Action:

- Right & left → Flex the neck
- one muscle → rotates face to opposite side



→ Insertion: - Mastoid process
- Lateral $\frac{1}{3}$ of superior nuchal line

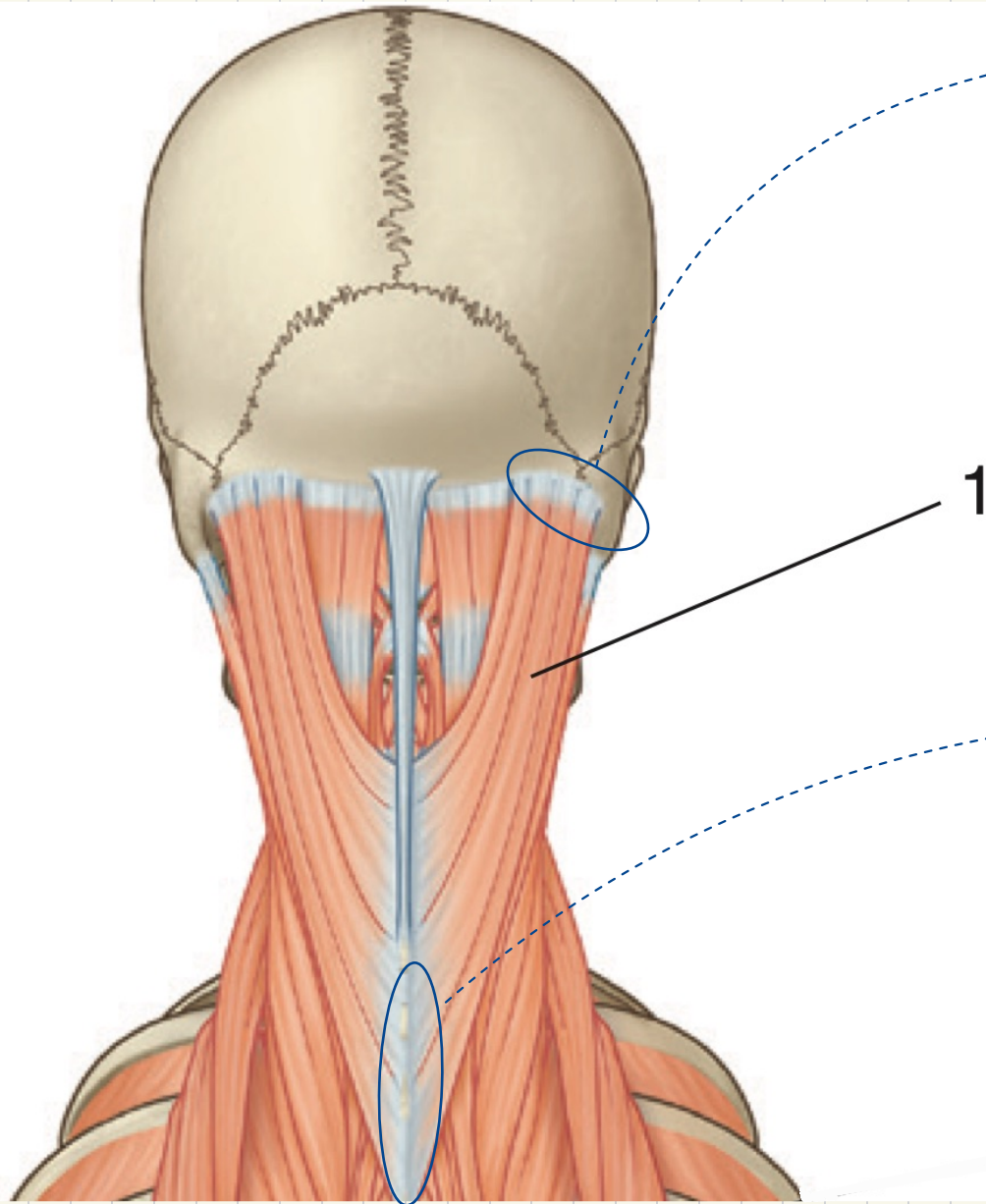
→ Origin: ① Manubrium Sterni
② Medial $\frac{2}{3}$ of clavicle

Sternocleidomastoid

Innervation: Dorsal rami of
cervical nerves (C₂-C₃)

Action:

- Right & Left muscles → extend the neck
- Turns the Face to the same side



→ Insertion: - Mastoid process
- Superior nuchal line

1

→ Origin:
- Ligamentum nuchae
- (C₇ - T_{3/4}) Spines

Splenius Capitis

Scalenus anterior

- Supplied by anterior rami of C4, 5, 6

- Action: ① Bilateral contraction, neck flexion
② Unilateral contraction, neck lateral flexion (ipsilateral)
③ Elevate 1st rib

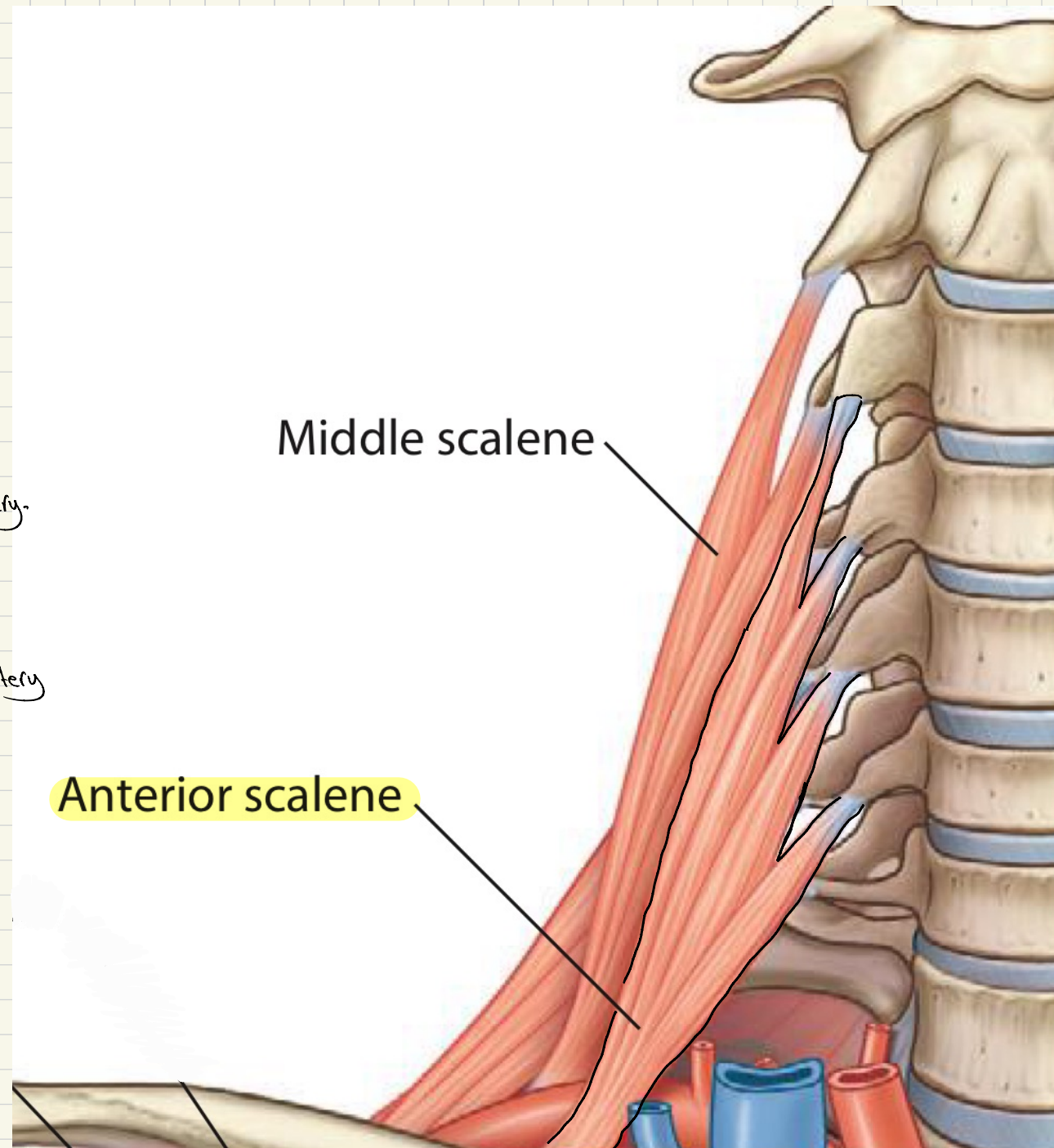
Relations:

Anteriorly: Phrenic nerve, internal jugular vein, Subclavian vein

Posteriorly: roots of brachial plexus, 2nd part of subclavian artery, Scalenus medius

Medially: 1st part of subclavian artery & its branches

Laterally: Trunks of brachial plexus, 3rd part of subclavian artery



Blood vessels of the neck

1st part: medial to scalenus anterior / 2nd part: deep to scalenus anterior / 3rd part: lateral to scalenus anterior → Dorsal scapular artery (in 66% of people)

① Subclavian

Inferior thyroid artery

Deep cervical artery

Superior intercostal A.

Costocervical trunk
↳ gives 2 divisions

Thyrocervical trunk
↳ gives 3 divisions

Vertebral A.

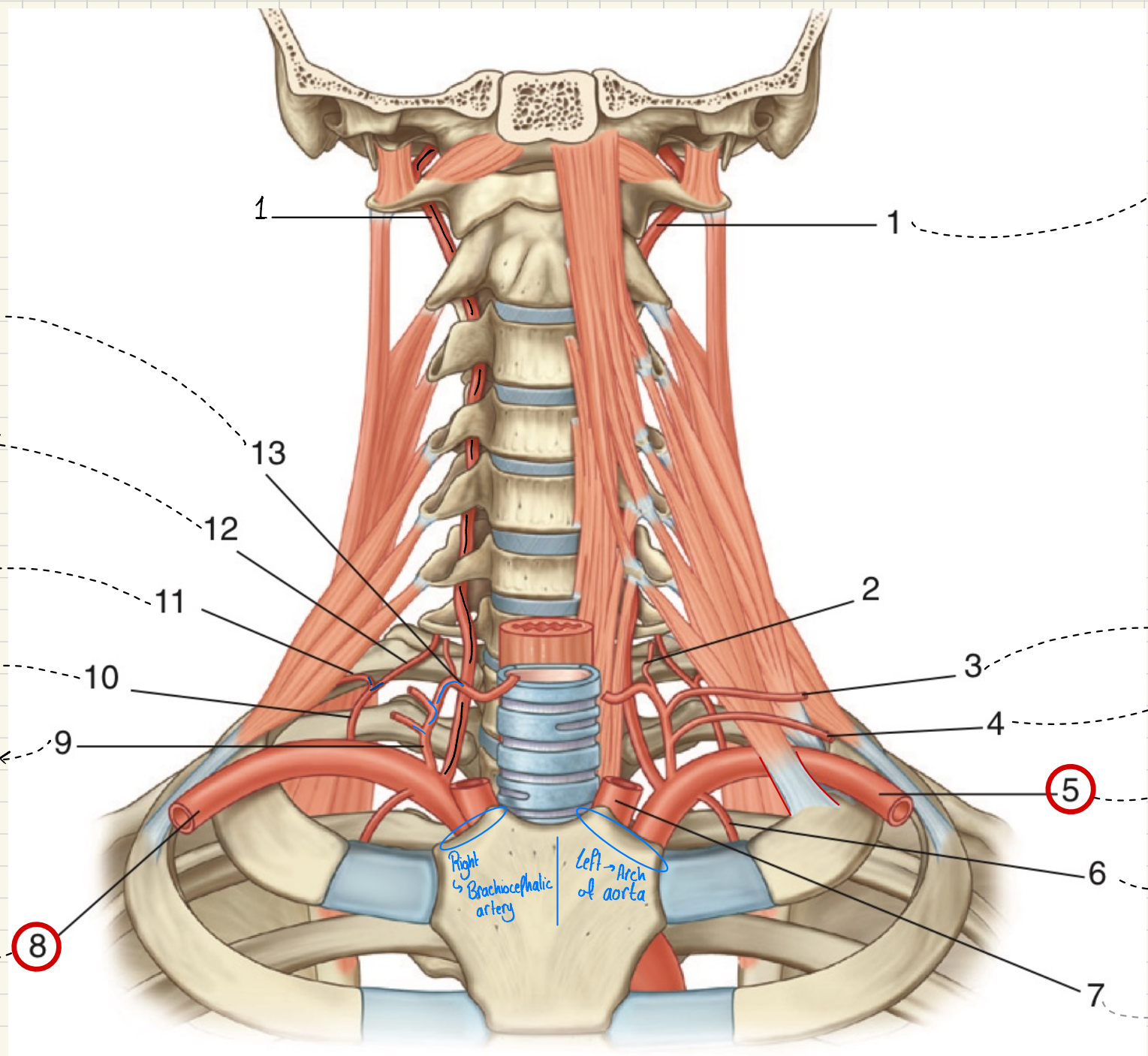
Transverse cervical A.

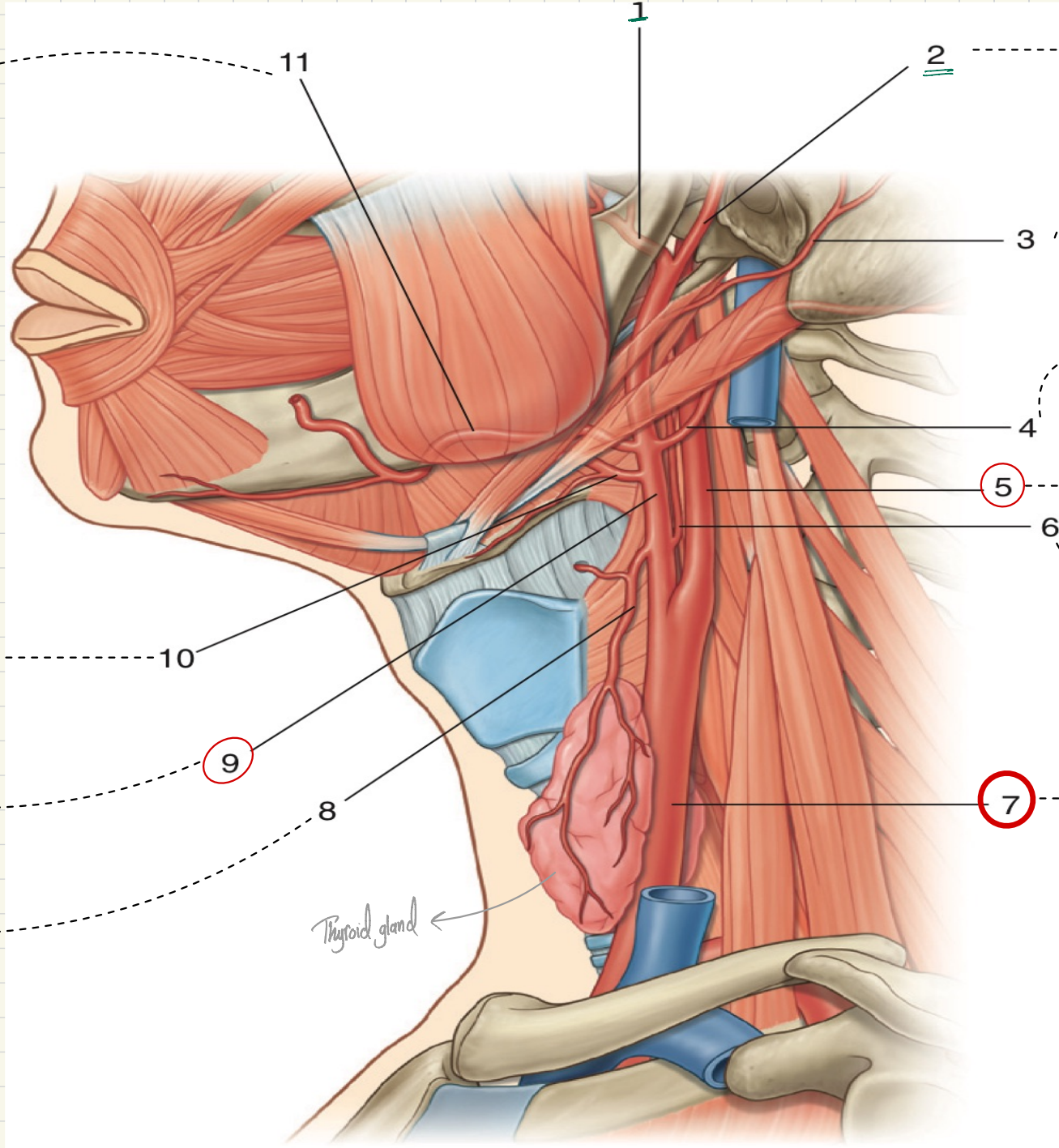
Suprascapular A.

Left Subclavian artery

Internal thoracic A.

② Left Common carotid A.





Maxillary artery

ECA terminates by dividing to 1 & 2

Superficial temporal artery

Posterior auricular artery (Post. of ECA)

Occipital artery (Posterior branch of ECA)

Internal carotid artery

Ascending pharyngeal artery
(medial-deep-branch of ECA)

Common Carotid Artery

internal External

Facial artery (Ant. of ECA)

Lingual artery (Ant. of ECA)

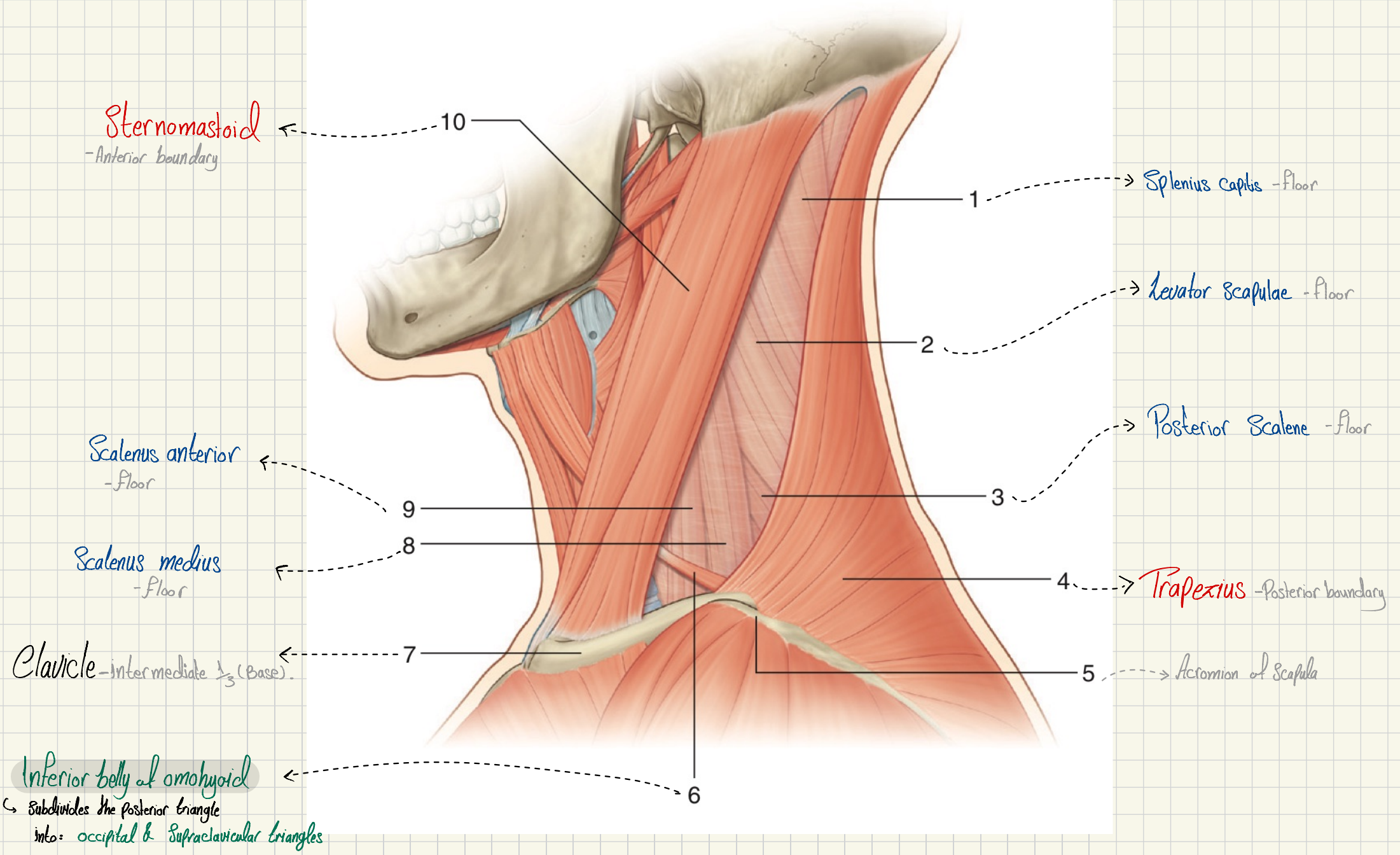
External Carotid artery

Superior thyroid artery
(anterior branch of ECA)

Thyroid gland

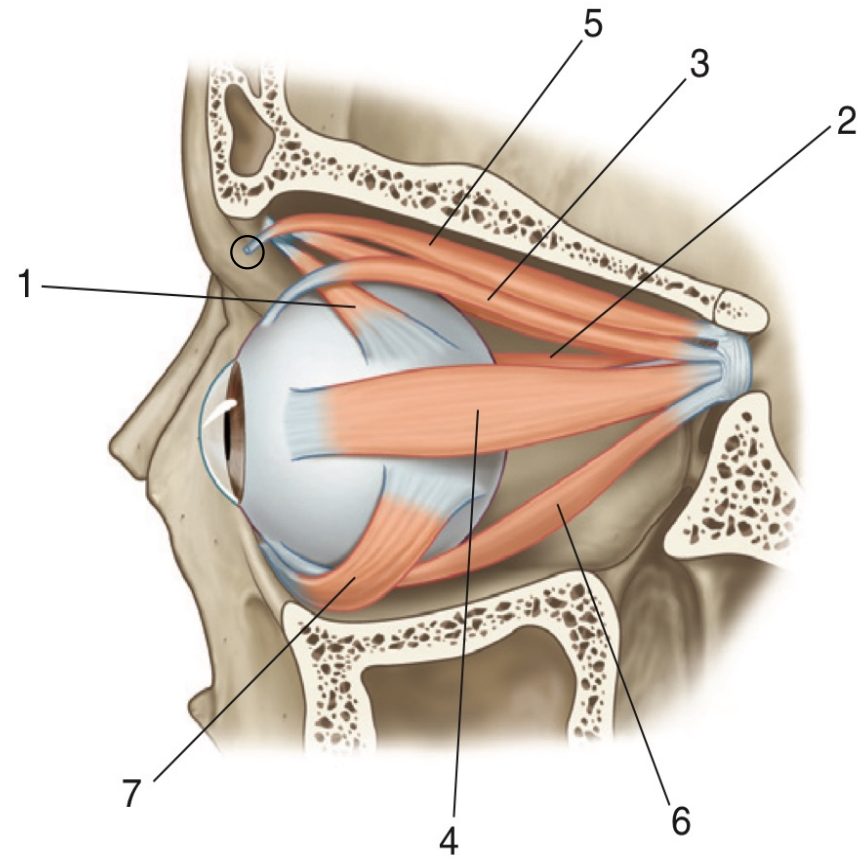
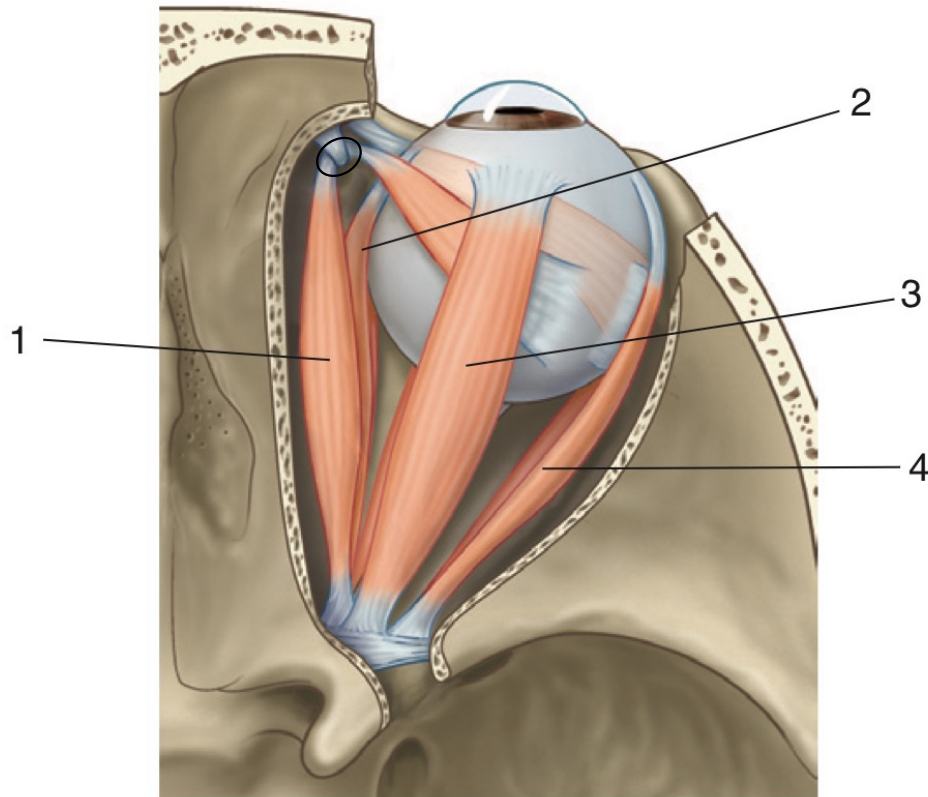
Neck triangles

Identify the indicated muscles and related structures of the posterior triangle of the neck.



Orbital cavity

Identify the indicated extra-ocular muscles.



1. Superior oblique : intorsion, abduction, depression

↳ out opposite to rectus

→ innervated by trochlear N.

2. Medial rectus : adduction

3. Superior rectus : intorsion, adduction, elevation

4. Lateral rectus : abduction

(The only rectus muscle that is not involved in adduction movement)

→ innervated by Abducens N.

* 5. Levator Palpebrae Superioris : elevation of the eye-lid

↳ (Muller's muscle) : innervated by Sympathetic autonomic

↳ Somatic → Superior division of oculomotor

6. Inferior rectus : extorsion, adduction, depression

7. Inferior oblique : extorsion, abduction, elevation

All muscles of the eye are innervated by oculomotor (III), Except (1 & 4)

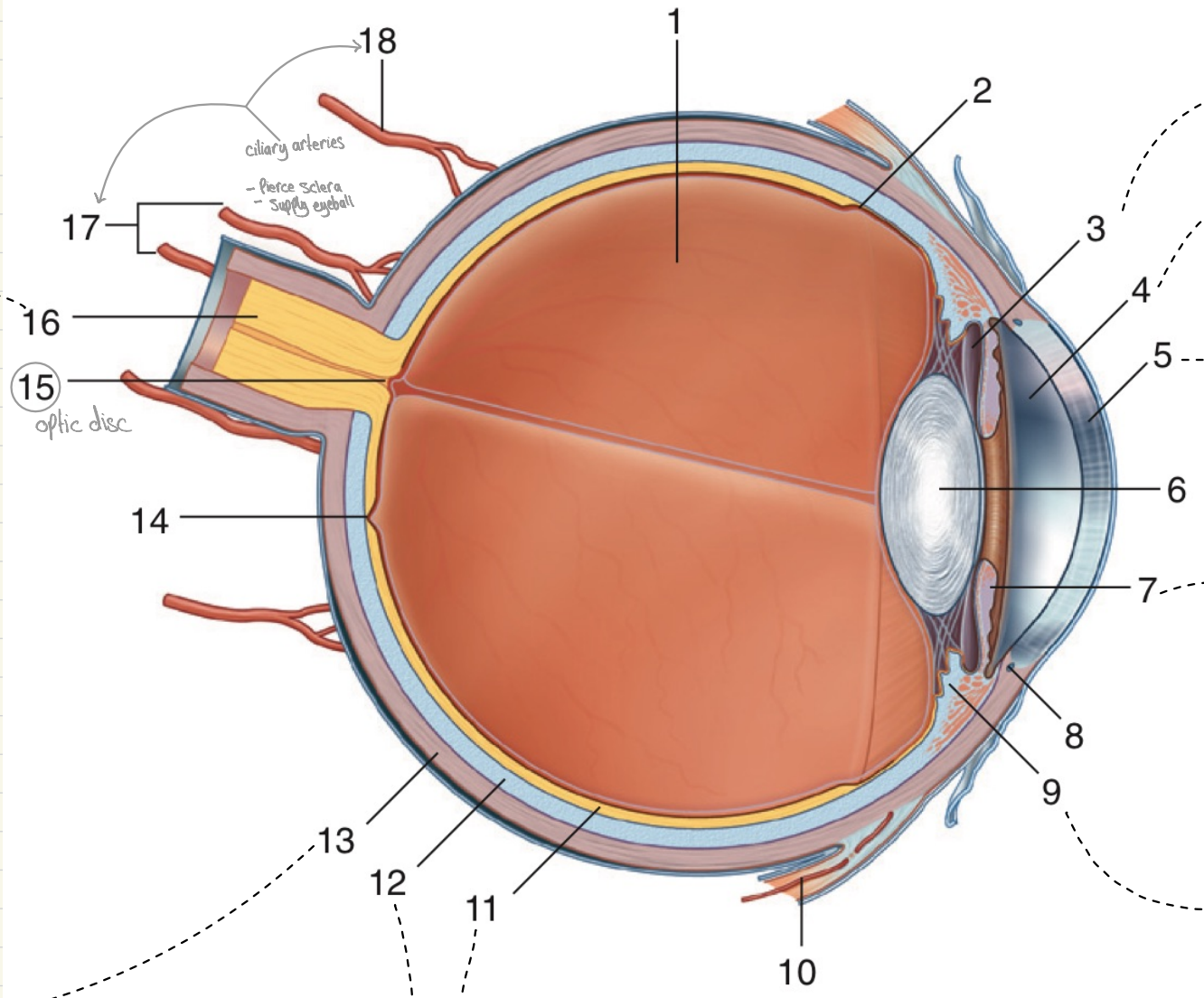
↳ Superior division : (3 & 5)

↳ Inferior division : (2, 6, 7)

- outer fibrous layer - middle vascular layer - internal nervous coat (Retina).

Identify the indicated structures related to the eyeball.

- (II) Optic nerve :
- arises from the ganglionic layer of the retina
 - pierces the posterior pole of the eyeball
 - Sensory, vision
 - origin: axons of the ganglionic cells of the retina



Posterior chamber (iris & lens)
Communicate through the pupil

Anterior chamber (iris & cornea)

Cornea: - Anterior / - transparent

lens

Iris: - Contractile / - pigmented
- involuntary circular & radial parts
- Surrounds the pupil

Ciliary body: consists of ciliary muscle

- Ciliary muscle: increases lens thickness as in accommodation, supplied by oculomotor nerve.

Sclera: - opaque
- dense white fibrous tissue

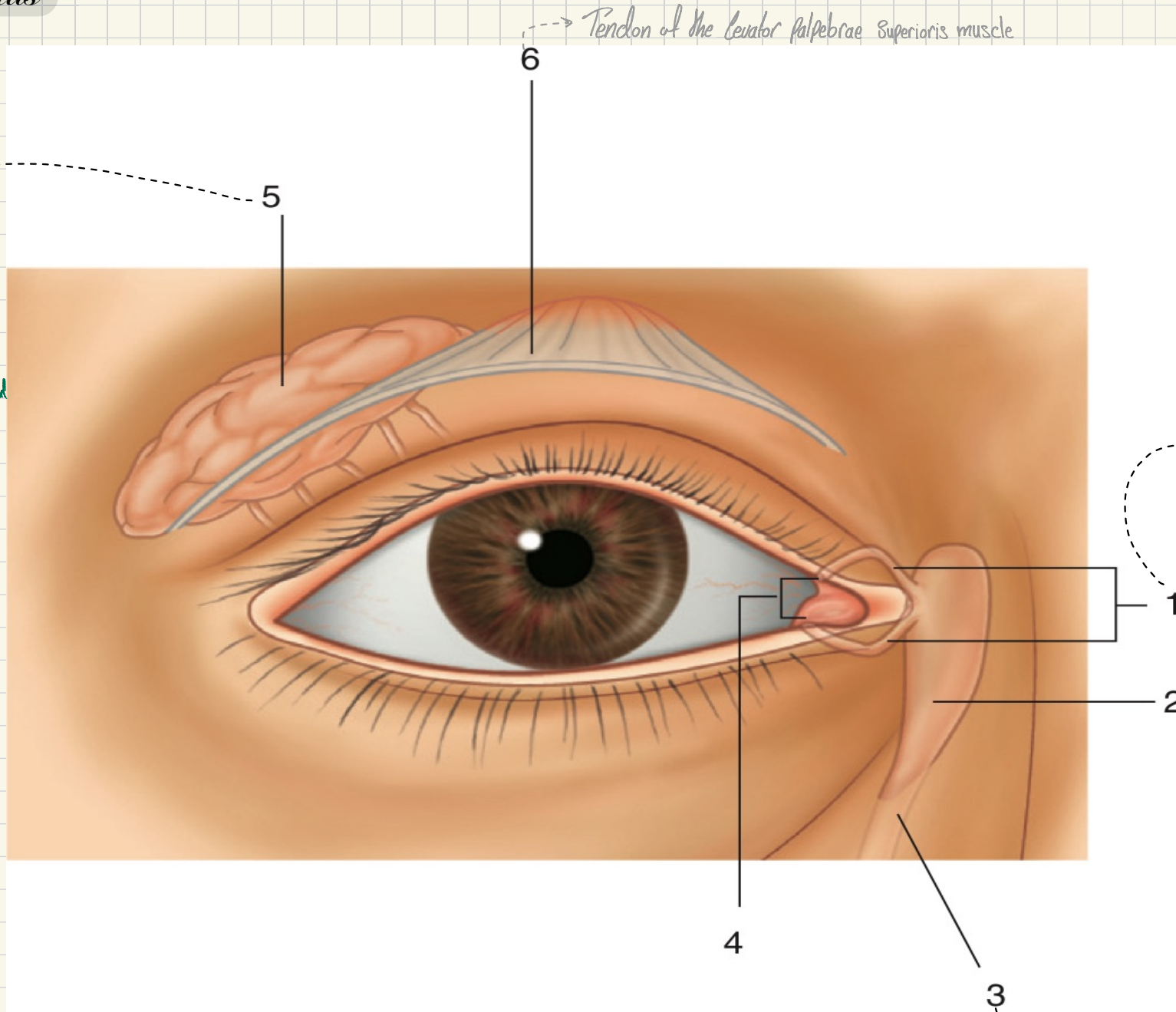
Choroid: - thin / - brown
- highly vascular membrane

Retina: 2 parts
- outer pigmented
- inner nervous

Lacrimal apparatus

Lacrimal gland

- Large orbital part
- Small palpebral part
- gland duct opens in the lateral part of Superior fornix of the Conjunctiva
- innervate by: greater superficial petrosal nerve (facial N.)



Tendon of the levator palpebrae superioris muscle

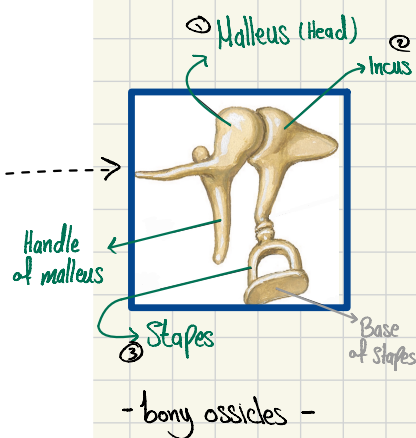
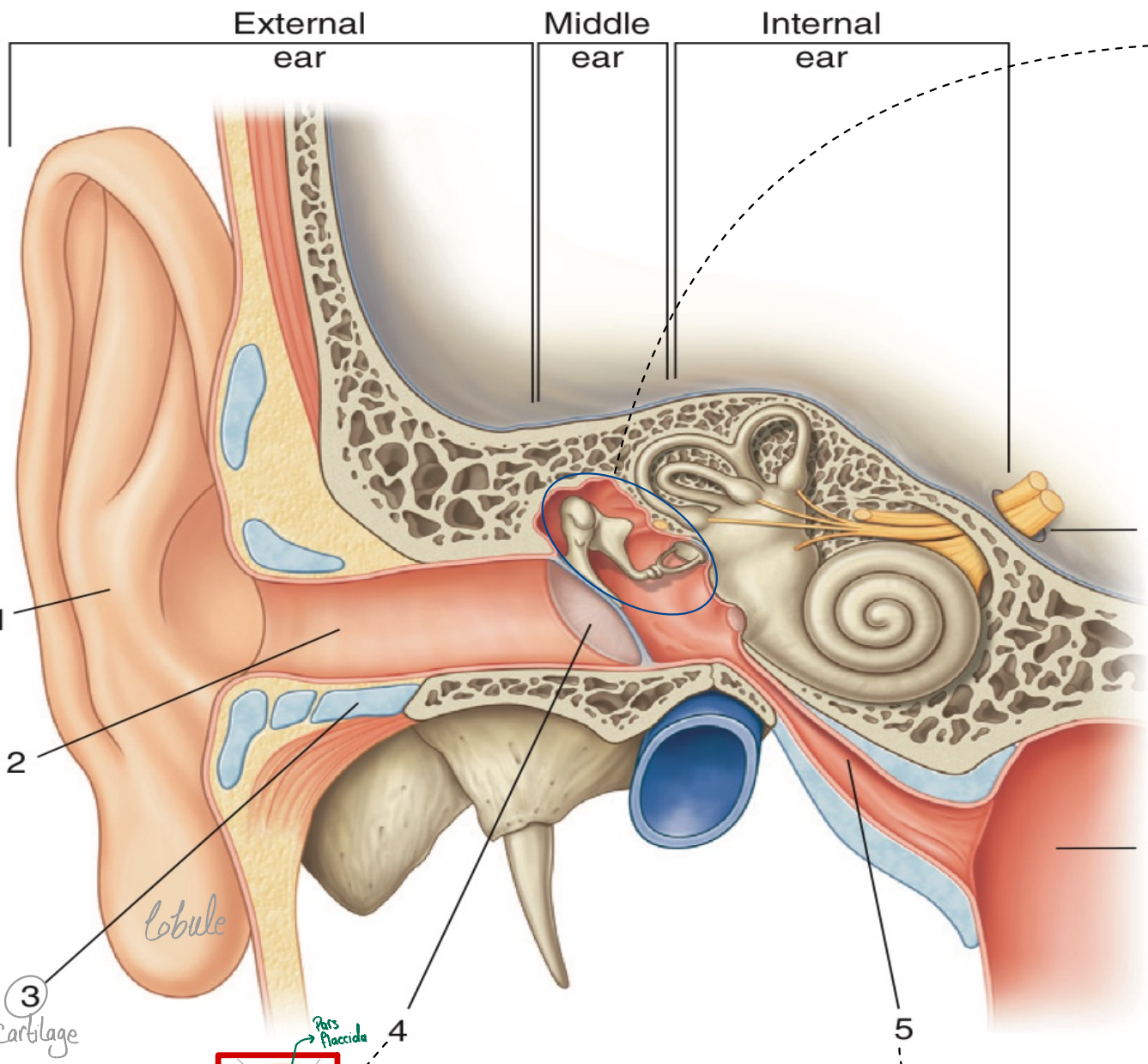
Lacrimal canaliculi
- Connects gland & sac

Lacrimal Sac

Nasolacrimal duct
- opens in the inferior meatus of the nose

The ear

Identify the indicated parts of the external, middle, and internal ear.

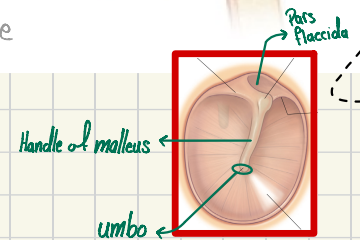


Internal acoustic meatus

Pharynx

Pharyngotympanic tube

Tympanic membrane (ear drum)
- has upper flaccid part, and lower tense part
- umbo - the point of attachment.



Auricle (ear pinna)
- Cartilage covered with skin, except the **Lobule** (earlobe).

External acoustic meatus
- lateral $\frac{1}{3}$ → cartilage
- medial $\frac{2}{3}$ → Bone
- Contains hair modified sweat glands producing cerumen (ear wax)

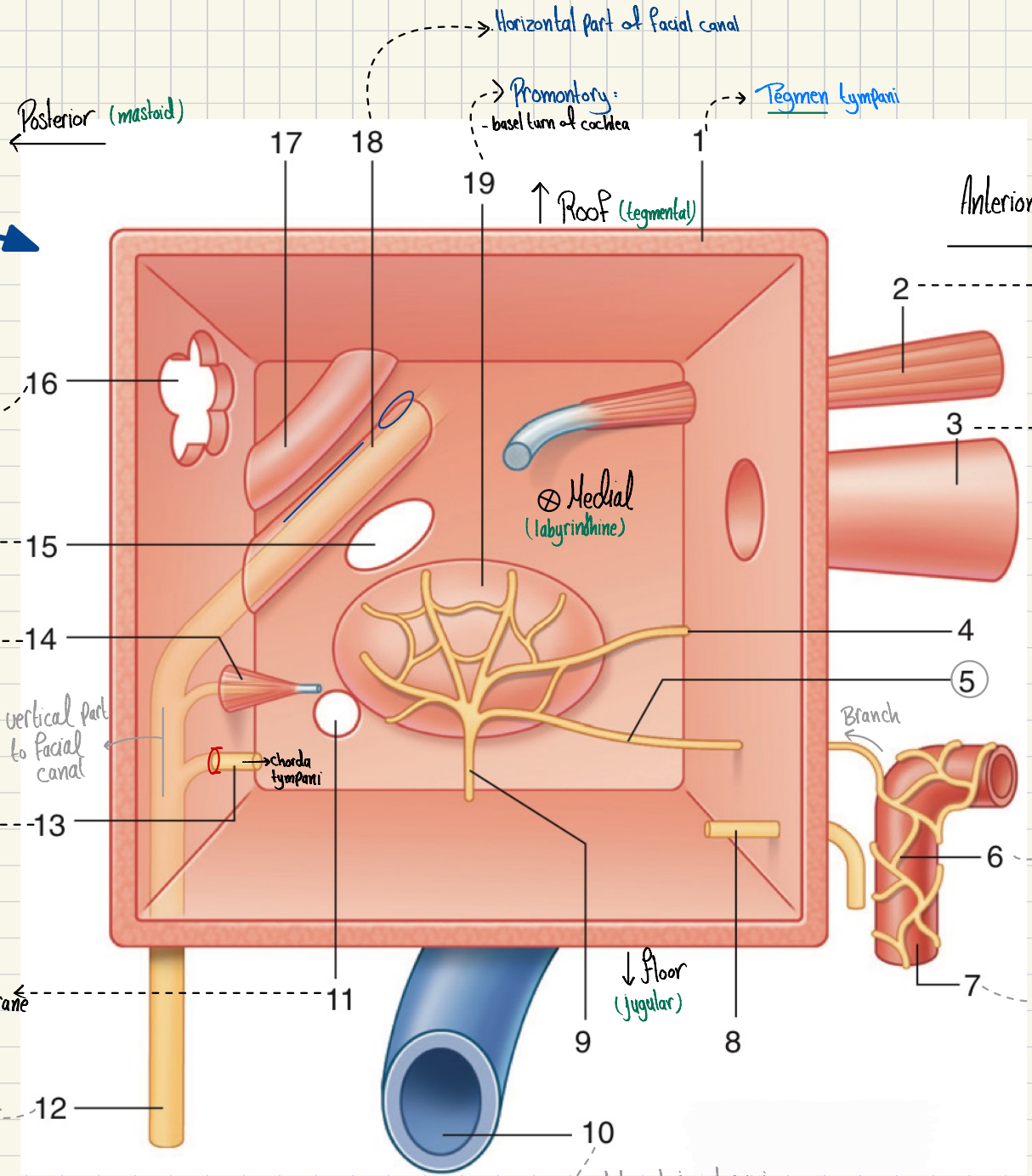
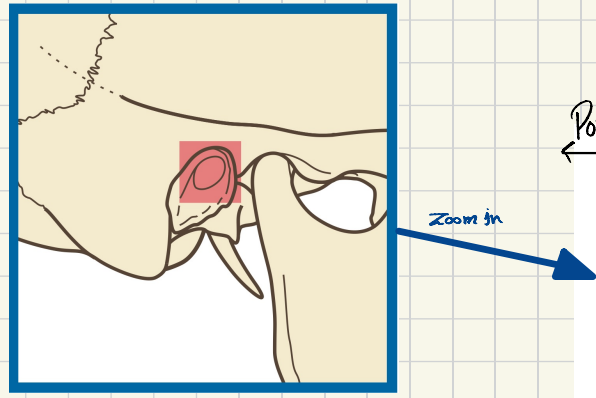
3
Cartilage

Lobule

The middle ear cavity

↳ (Biconcave cavity with 6 walls).

→ ⊙ Lateral (membranous) wall
 ↳ upper part → bony
 ↳ lower part → ear drum



Posterior (mastoid) ←

Zoom in

Auditus to mastoid antrum
 - Small cavity

Oval window: closed by stapes

Pyramid: transmits stapedius muscle

Vertical part to facial canal

Posterior canaliculus for chorda tympani

Round window: closed by secondary tympanic membrane

Facial nerve

Horizontal part of facial canal

Promontory: basal turn of cochlea

Tegmen tympani

Roof (tegmental)

Anterior (carotid)

Opening for tensor tympani muscle
 (supplied by trunk of mandibular N)

Pharyngotympanic tube (opening of Eustachian)

- connects the middle ear with the nasopharynx
- allows entry of air to equalize pressure
- Lateral 1/3 → bony, medial 2/3 → cartilaginous

Internal carotid plexus

Internal carotid artery

Internal jugular vein