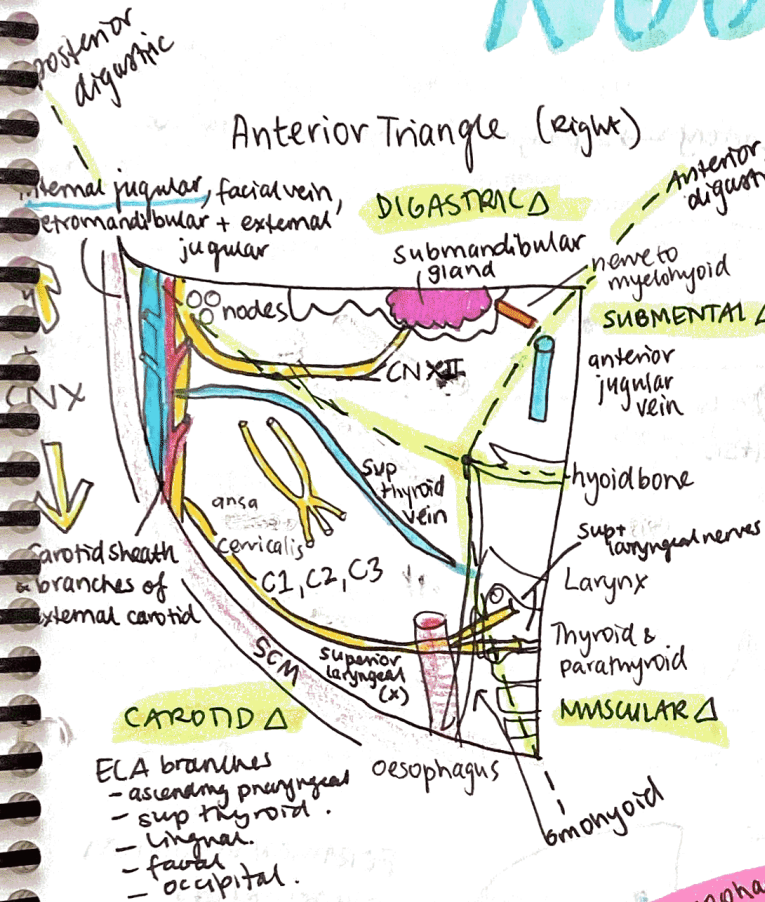


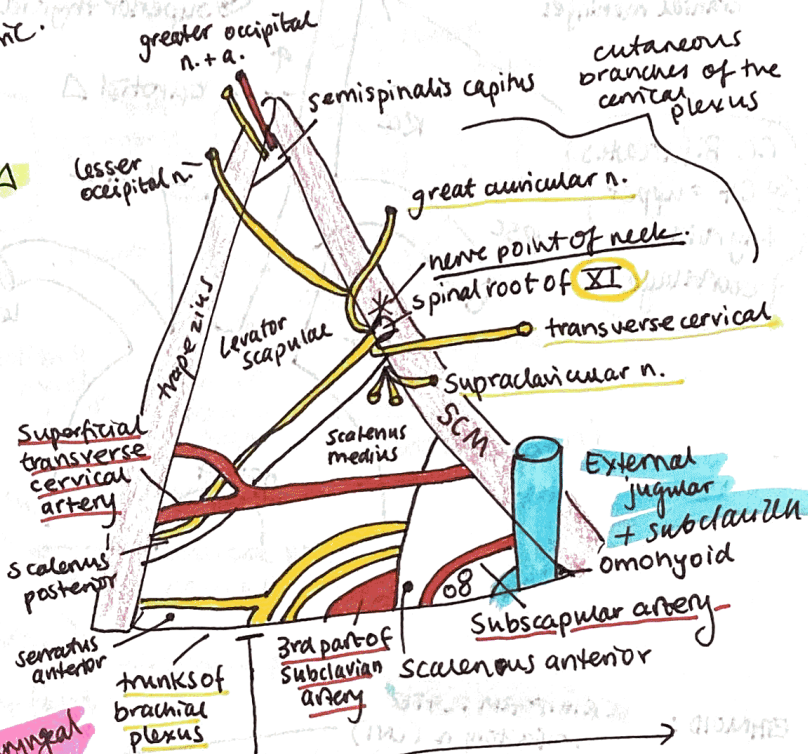
Head & Neck.

Week
14
Anatomy

Anterior Triangle (Right)



Posterior Triangle (Right)

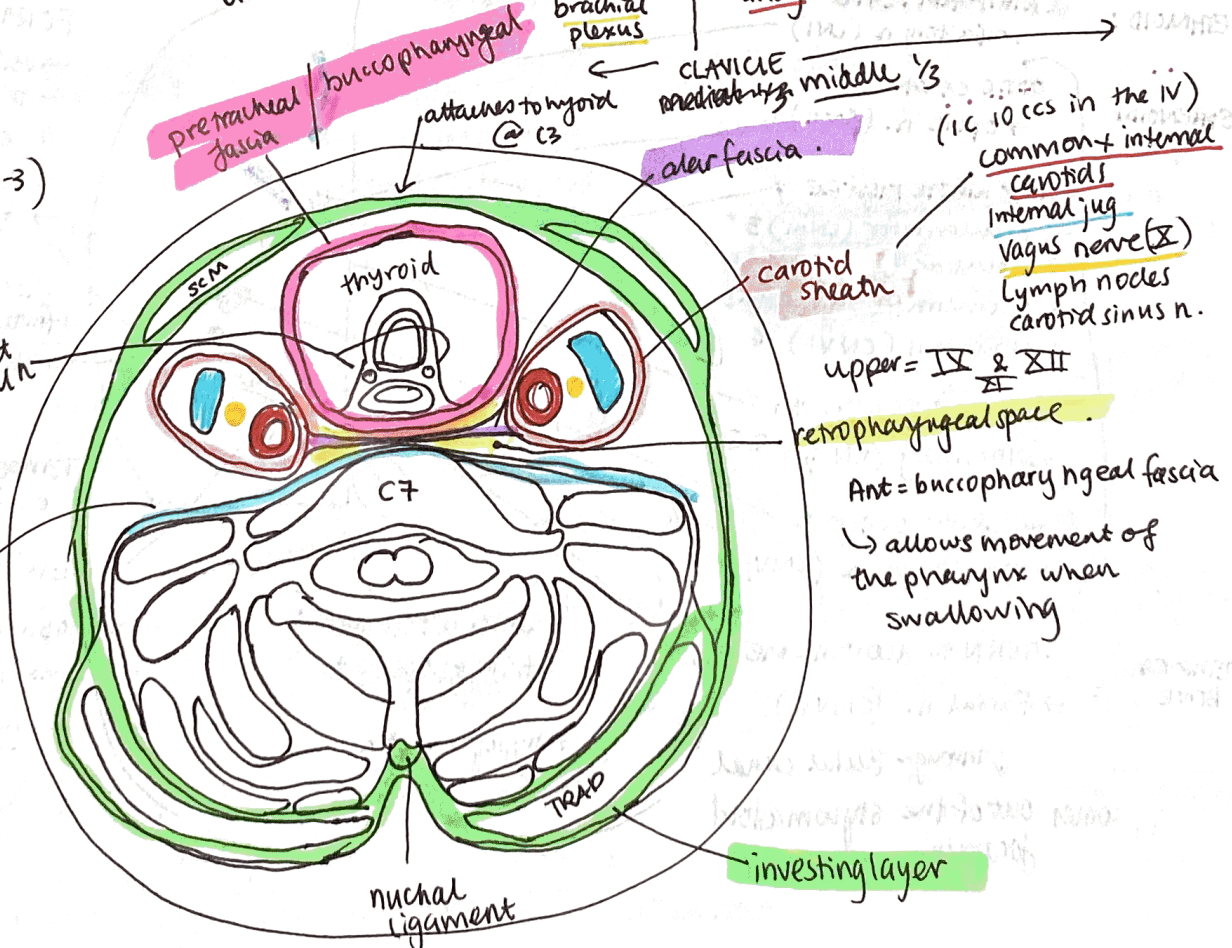


Topography

- Hard palate (C1)
- Lower mandible (C2-3)
- Hyoid bone (C3)
- Cricoid (C6)

recurrent laryngeal n.

prevertebral fascia



Posterior auricular a.
→ parotid, facial n.,
auricle, scalp + muscles

Superficial Temporal a.

Maxillary a.

terminal branches.

Charlotte Durand - acemprimarypodcast.com

Occipital artery
→ posterior scalp

carotid triangle & sheath

Facial a. → submandibular gland, floor of mouth, most facial muscle

Lingual a. → tongue

Ascending pharyngeal a.
→ pharynx, prevertebral
muscles, middle ear,
cranial meninges

ECA

Superior thyroid artery → sup thyroid, infrahyoid + SCM, larynx.

carotid Δ

RCC

Left CC

CC Bifurcates
@ C4 = upper
thyroid
cartilage.

RSC

Left SC

BCT

AORTA

ETHMOID:

CRIBIFORM PLATE
→ olfactory n. (CN I)

SPHENOID:

OPTIC CANAL
→ optic n. (CN II)

SUP ORBITAL FISSURE
→ oculomotor (CN III) 3
→ trochlear (CN IV) 4
→ ophthalmic (CN V₁) 5-1
→ Abduens (CN VI) 6

FORAMEN ROTUNDUM
→ Maxillary (CN V₂) 20

FORAMEN OVALE
→ mandibular n. (CN V₃)

TEMPORAL BONE:

INTERNAL ACOUSTIC MEATUS
→ Facial n. (CN VII)

↓ through facial canal
comes out of the styromastoid
foramen

OCCIPITAL BONE
HYPOGLOSSAL CANAL
→ Hypoglossal n.

FORAMEN MAGNUM
→ vertebral a's
→ medulla + meninges
→ CN XI (spinal)
→ aurial veins
→ A/P spinal a's.

foramen spinosum
middle meningeal artery

TEMPORAL + OCCIPITAL JOIN

JUGULAR FORAMEN 9/10/11

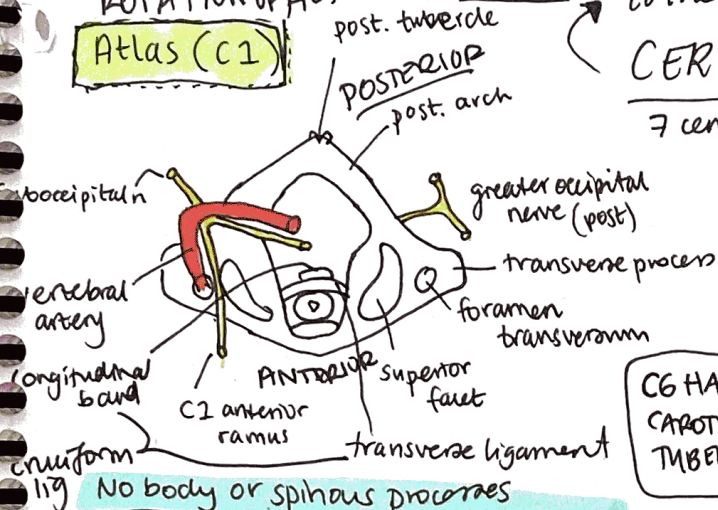
→ glossopharyngeal (CN IX)
→ Vagus (CN X)
→ Accessory (CN XI)

Wk 14 Anatomy

Vertebrae.

Flex/Ext - atlanto occipital
 ROTATION OF HEAD - atlanto axial

Atlas (C1)



Nerves exit superiorly to the vertebrae discs below

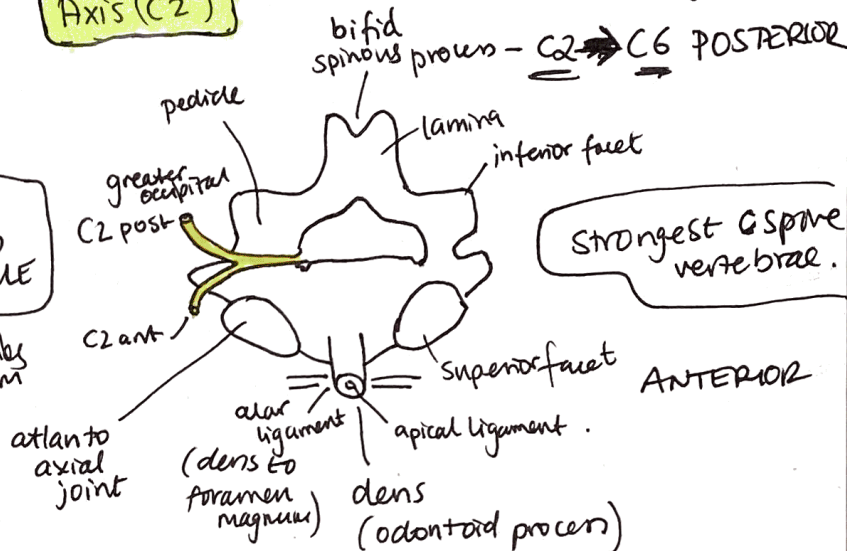
CERVICAL

7 cervical vertebrae.

Axis (C2)

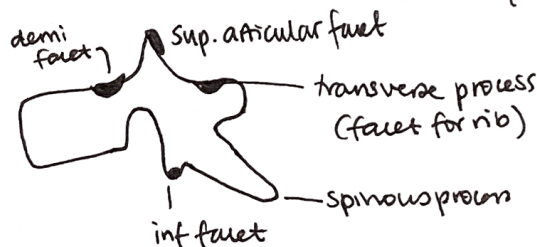
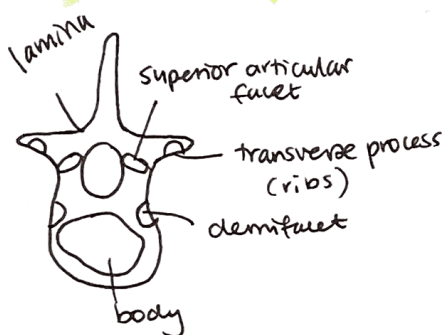
C6 HAS CAROTID TUBERCLE

Cervical nbs come from C7



Strongest & spine vertebrae.

THORACIC - best rotation



Superior thoracic (T1-4)

- share like C-spine
- T1 complete facet
- heart shaped body
- long/vertical sps.
- round spinal canal

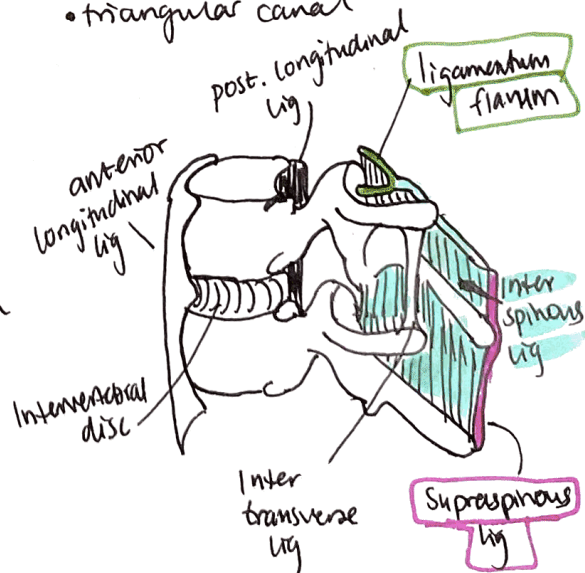
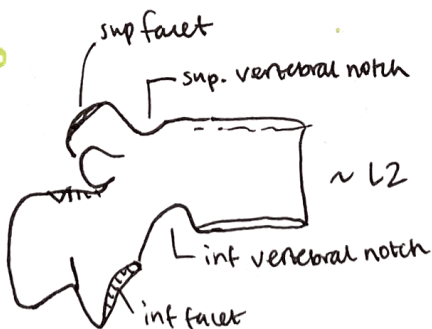
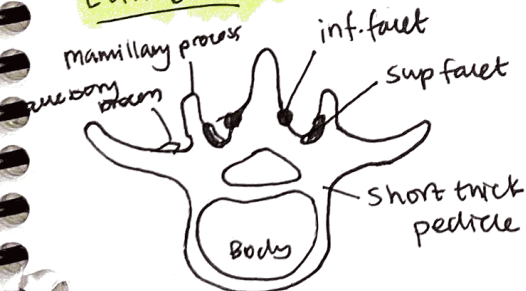
Typical (T5-8)

- heart shaped body
- coronally orientated facets

Inferior (T9-12)

- more like lumbar
- tubercles
- T12 acts like lumbar (flex/Ext only)
- singular facets
- triangular canal

LUMBAR - no rotation



Layers pierced by lumbar puncture

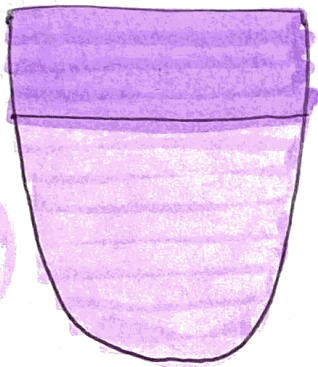
Skin, subcutaneous tissue, supraspinous ligament, interspinous ligament, **ligamentum flavum**, dura, arachnoid.

Head & Neck 2

1. Innervation of the tongue

post
1/3

anterior
2/3



touch + taste by
glossopharyngeal
(CNIX)

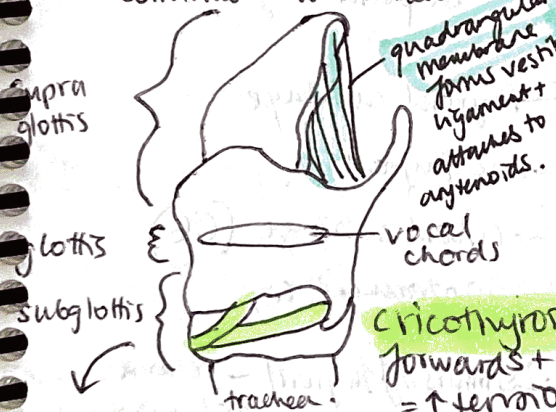
general
sensation
= trigeminal
(CNV)
via lingual n.
CNV3

taste to ant 2/3
= facial n. (CNVII) via
chorda tympani

poor blood supply along the
midline.

2. Structure & landmarks of the larynx

- Anterior compartment of neck
- C3 - C6 level
- Continuous w trachea



damaged by

- apical Ca
- thyroid ca
- Aneurysm
- LNS
- Surgery

quadrangular
membrane
forms vestibular
ligament +
attaches to
arytenoids.

Cricothyroid - pulls larynx
forwards + down
= ↑ tension on VC
= ↑ pitched voice

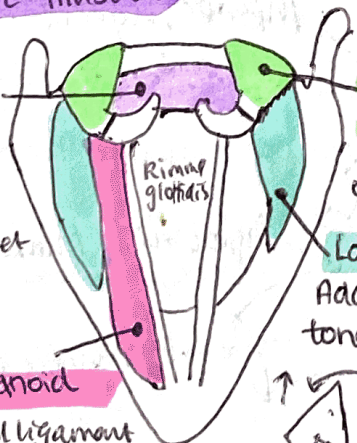
Intrinsic muscles

Transverse
arytenoid

Adduct
arytenoids
narrows
aryngeal inlet

Thyroarytenoid

Relax vocal ligament
= soft voice



Posterior crico
arytenoid

Abducts vocal folds
only one that widens
rima glottidis.

Lateral cricoarytenoid

Adducts vocal folds; modulates
tone & volume of speech

muscular process (rotation)
→ lots of movement
vocal process (rotation)

Styloglossus
hypoglossal (CNXII)

All via
hypoglossal except

Hyoglossus

hypoglossal
(CNXII)

geniohyoidus
hypoglossal (CNXII)

genioglossus
hypoglossal (CNXII)

palatoglossus

Vagus (CNX)

swallowing

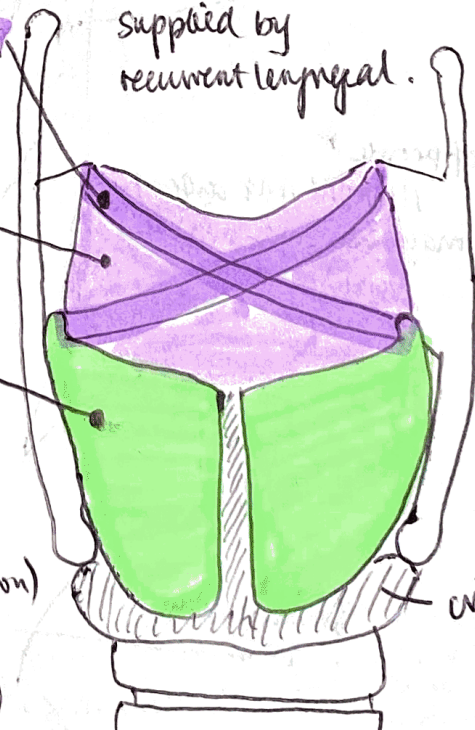
3. Nerve supply to intrinsic muscles of larynx

- Motor & sensory via Vagus nerve CNX
- Recurrent laryngeal n. (behind pretracheal fascia)
 - sensory to infraglottis
 - motor to all internal except cricothyroid
- Superior laryngeal n. (from vagus)
 - internal branch = sensory to supraglottis
 - external branch = motor to **cricothyroid**

trachea also
supplied by
recurrent laryngeal.

oblique arytenoid
Adduct arytenoids

transverse
arytenoid



cartoid.

Swallowing reflexAfferents

- trigeminal V
- glossopharyngeal IX
- vagus X

Nucleus Tractus Solitarius
Nucleus Ambiguus

Efferents

- trigeminal V
- facial VII
- hypoglossal XII

gag reflex

→ ? epiglottis from sensory vagus.

Afferents

glossopharyngeal IX

↳ gag absent on the side of a lesion.

Efferents

glossopharyngeal IX

& vagus X

↓
muscle contraction.

Blood supply above the cords = Superior thyroid artery from ECA

External sup laryngeal n = cricothyroid

Internal sup laryngeal n = sensory ^{above} to vocal cords

Recurrent laryngeal nerve = sensory below the cords (always goes behind pretracheal fascia)

Glossopharyngeal = sensory post 1/3 of tongue, pharynx, carotid sinus & body
motor = stylopharyngeal
PSNS = parathyroid gland.

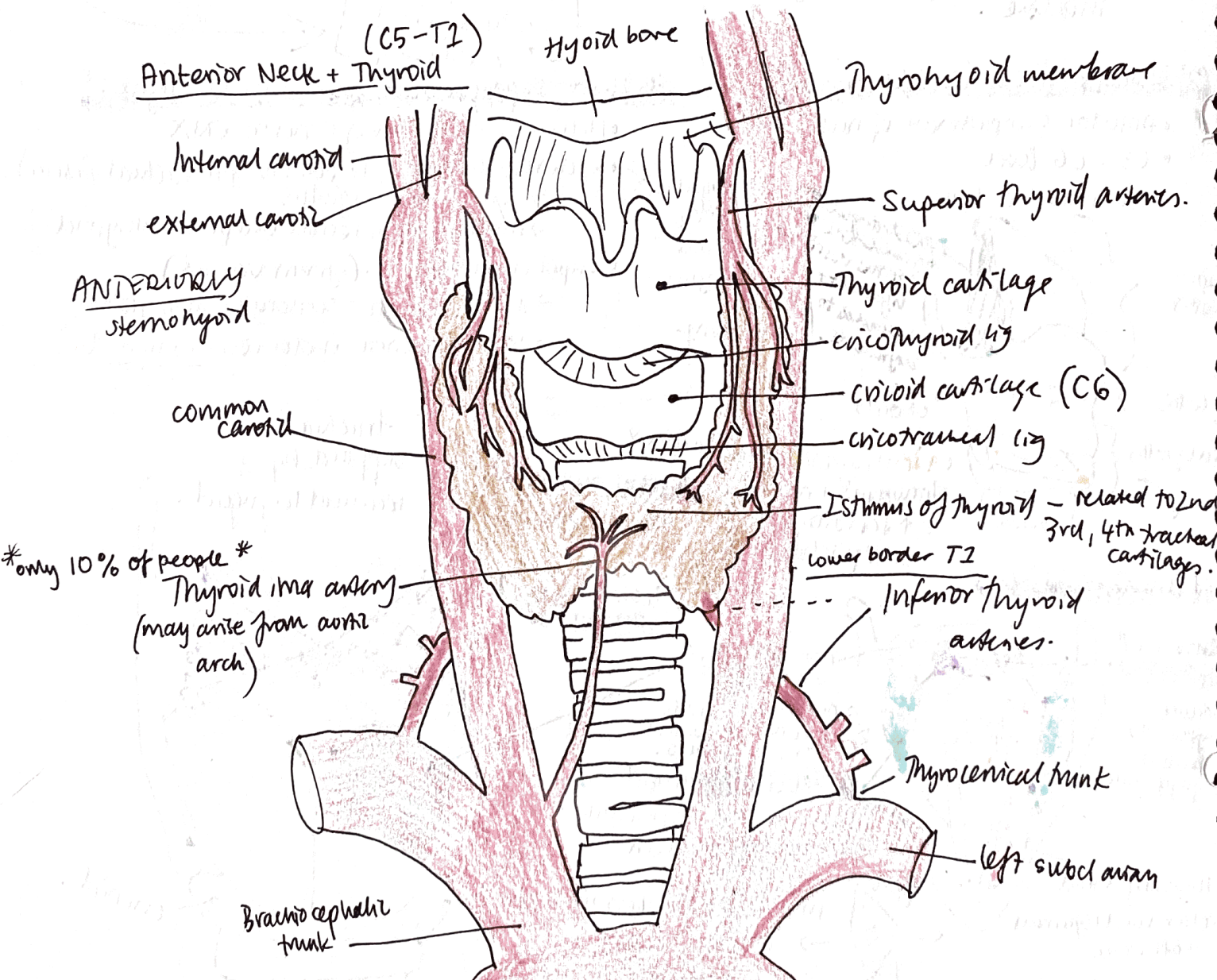
NB GAG Reflex

Afferent = glossopharyngeal → nucleus tractus solitarius.

Efferent = vagus.

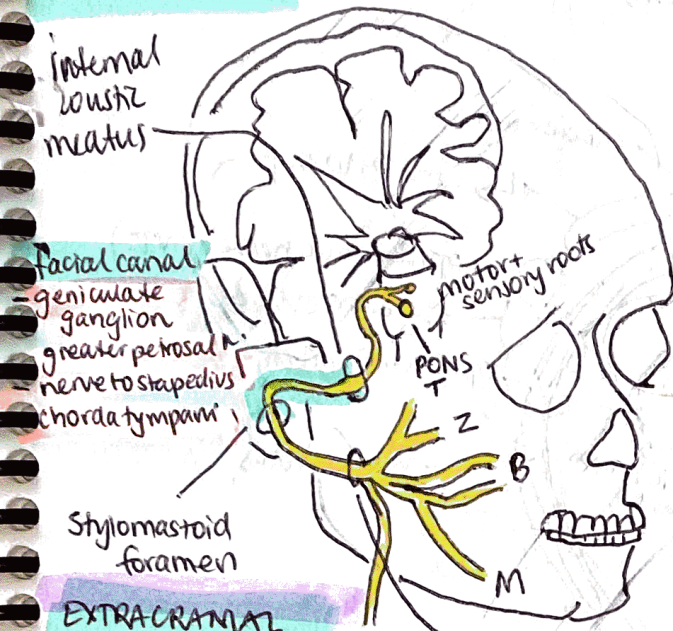
Doesn't happen w food due to "conditional familiarity".

Sympath. Nerve supply from sup/middle/inf central ganglion



4. Outline the course of the facial nerve.

INTRACRANIAL



MOTOR

- Temporal - frontalis, orbicularis oculi, corrugator
- Zygomatic - orbicularis oculi
- Buccal - orbicularis oris, buccinator, zygomaticus
- Marginal mandibular - Mentalis
- Cervical - platysma

EXTRACRANIAL

- ① posterior auricular n.
- ② nerve to digastric (posterior belly)
- ③ nerve to stylohyoid

SENSORY/SPECIAL

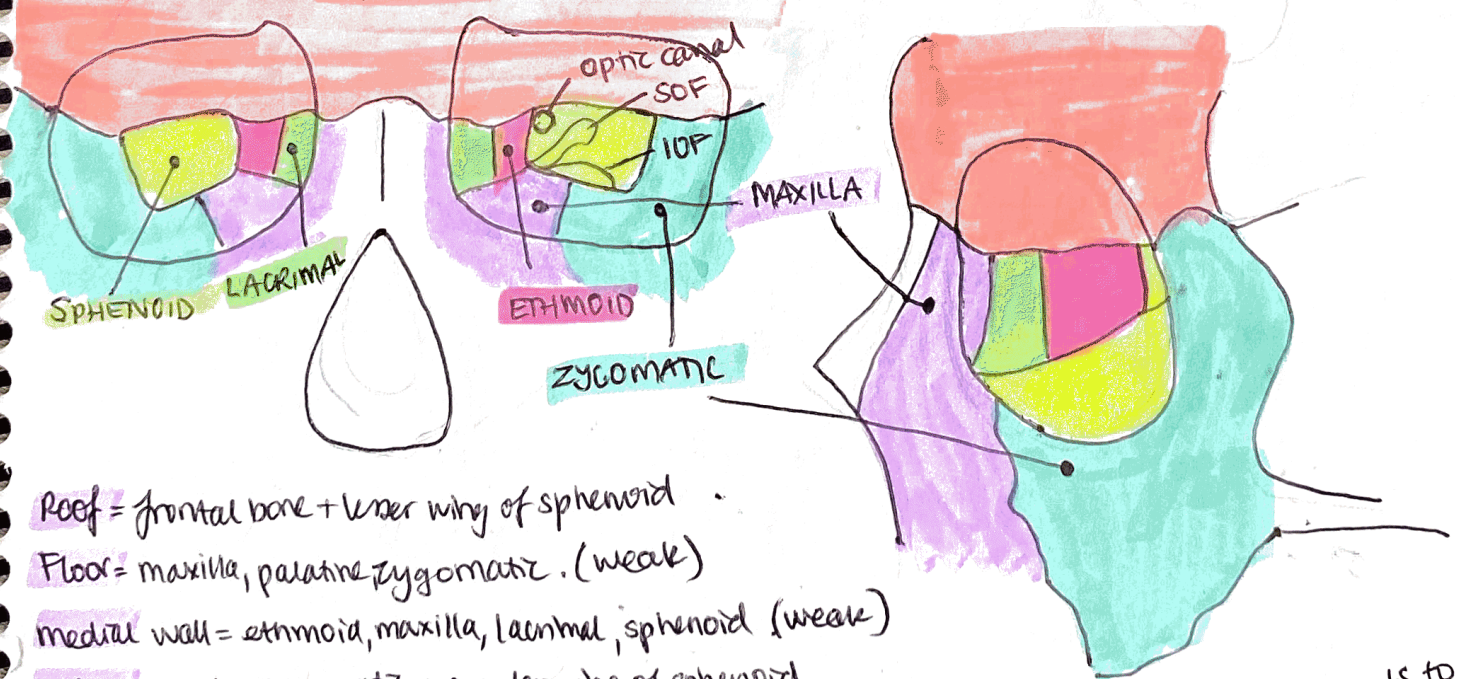
small area around the concha of auricle
taste ant 2/3 tongue via chorda tympani, travels in the lingual n. through infratemporal fossa.

PARASYMPATHETIC via greater petrosal + chorda tympani

- glands of head + neck
 - submandibular + sublingual
 - nasal, palatine, pharyngeal
 - lacrimal

6. Bones of the orbit.

FRONTAL



Roof = frontal bone + lesser wing of sphenoid

Floor = maxilla, palatine, zygomatic. (weak)

Medial wall = ethmoid, maxilla, lacrimal, sphenoid (weak)

Lateral wall = zygomatic + greater wing of sphenoid

Apex = optic foramen

OPTIC CANAL = optic n. + ophthalmic artery

SOF = lacrimal, frontal, trochlear (CN IV), oculomotor (CN III), nasociliary, abducens (CN VI)

IOF = zygomatic bch of maxillary n., inf. optic vein, sympathetic n.'s → leads to temporal, infratemporal + pterygopal fossa

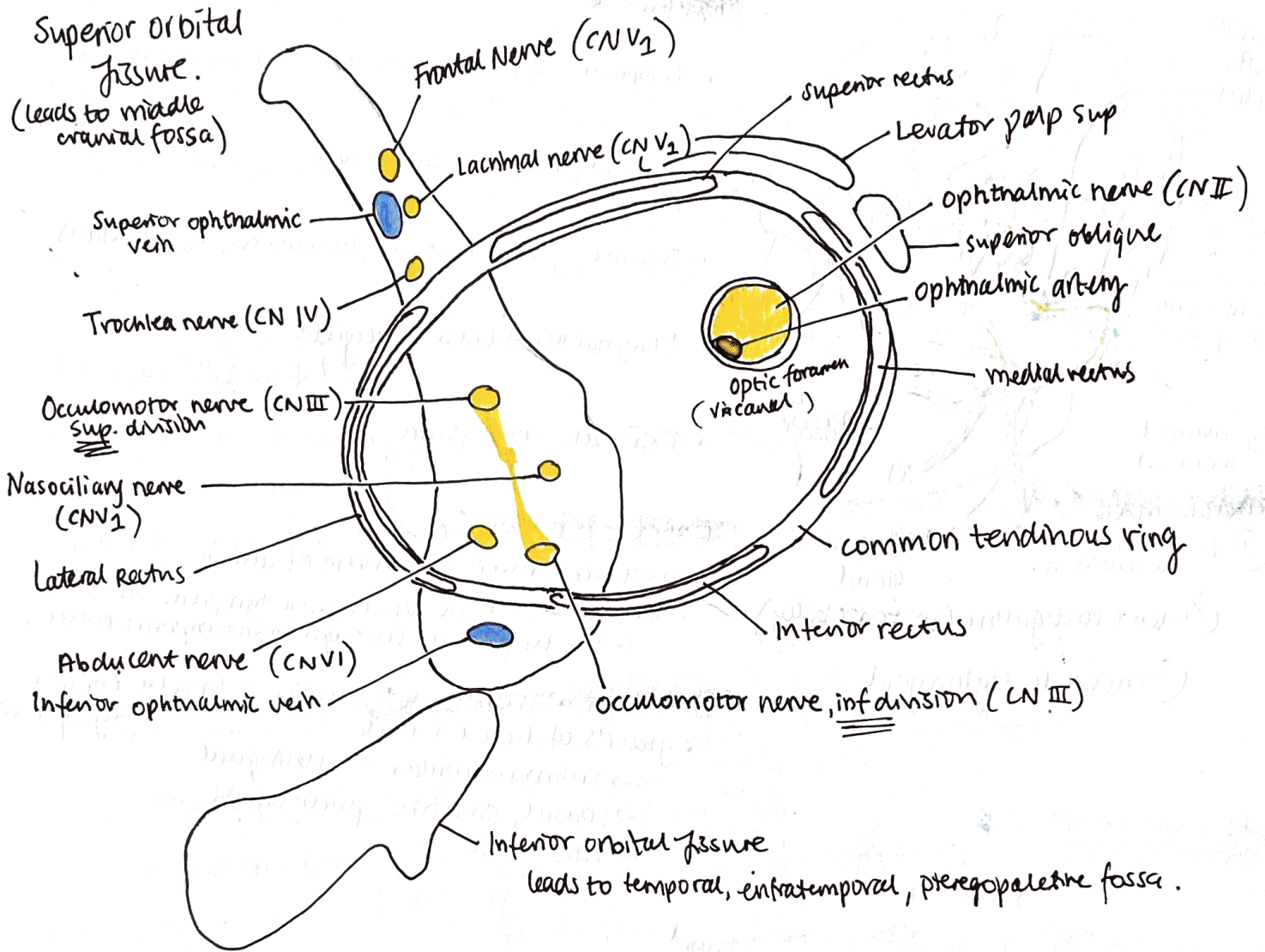
leads to middle cranial fossa

+ sup. ophthalmic vein

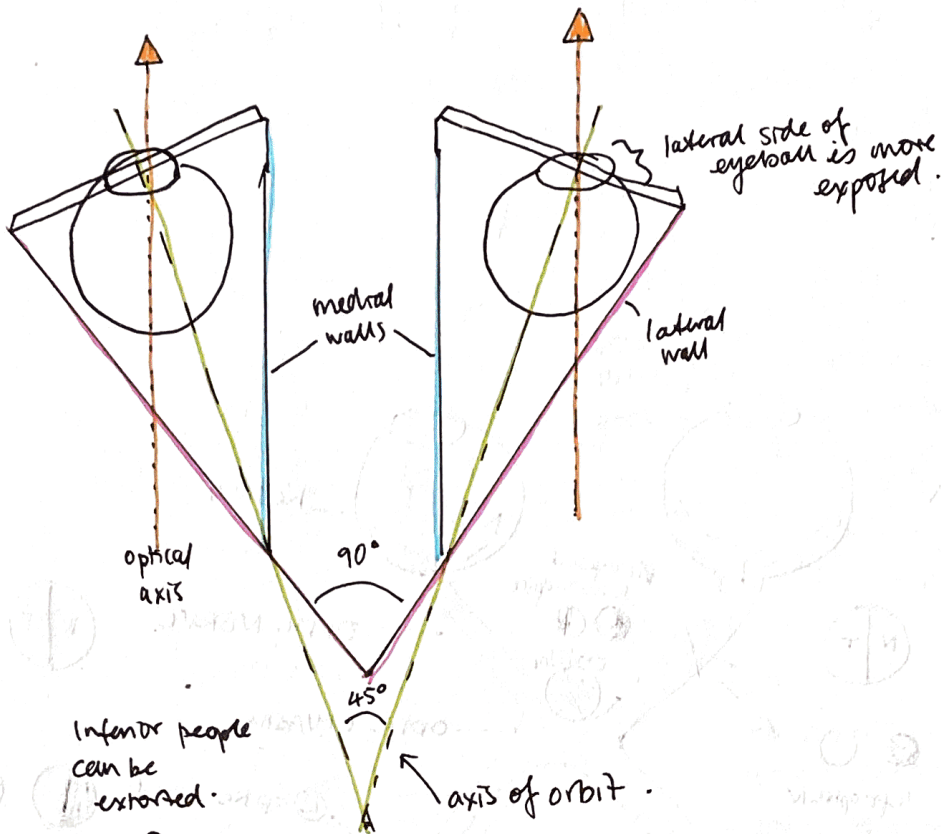
Orbital fissures

lateral ← RIGHT EYE → medial

Nerves CN III, IV, V₁, VI
2 veins



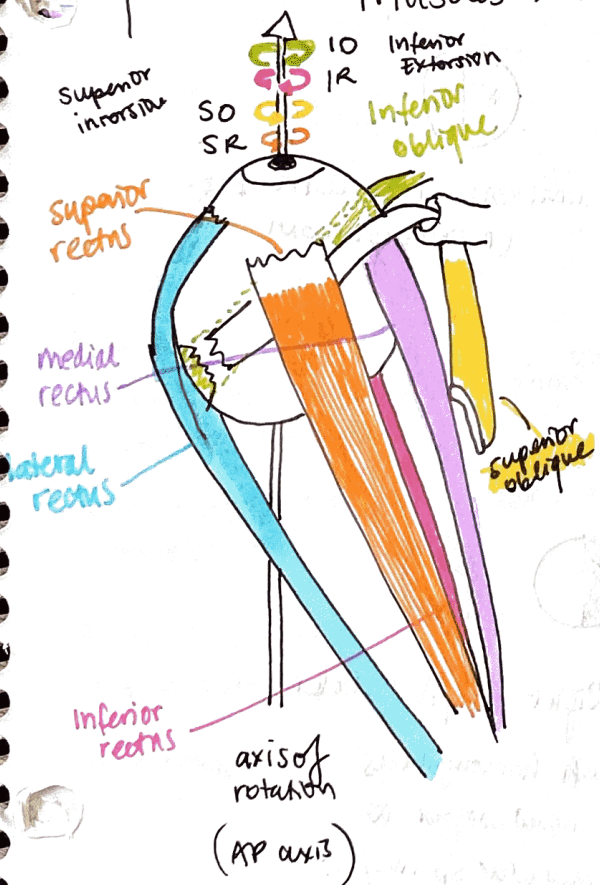
ORBITS + EYEBALLS

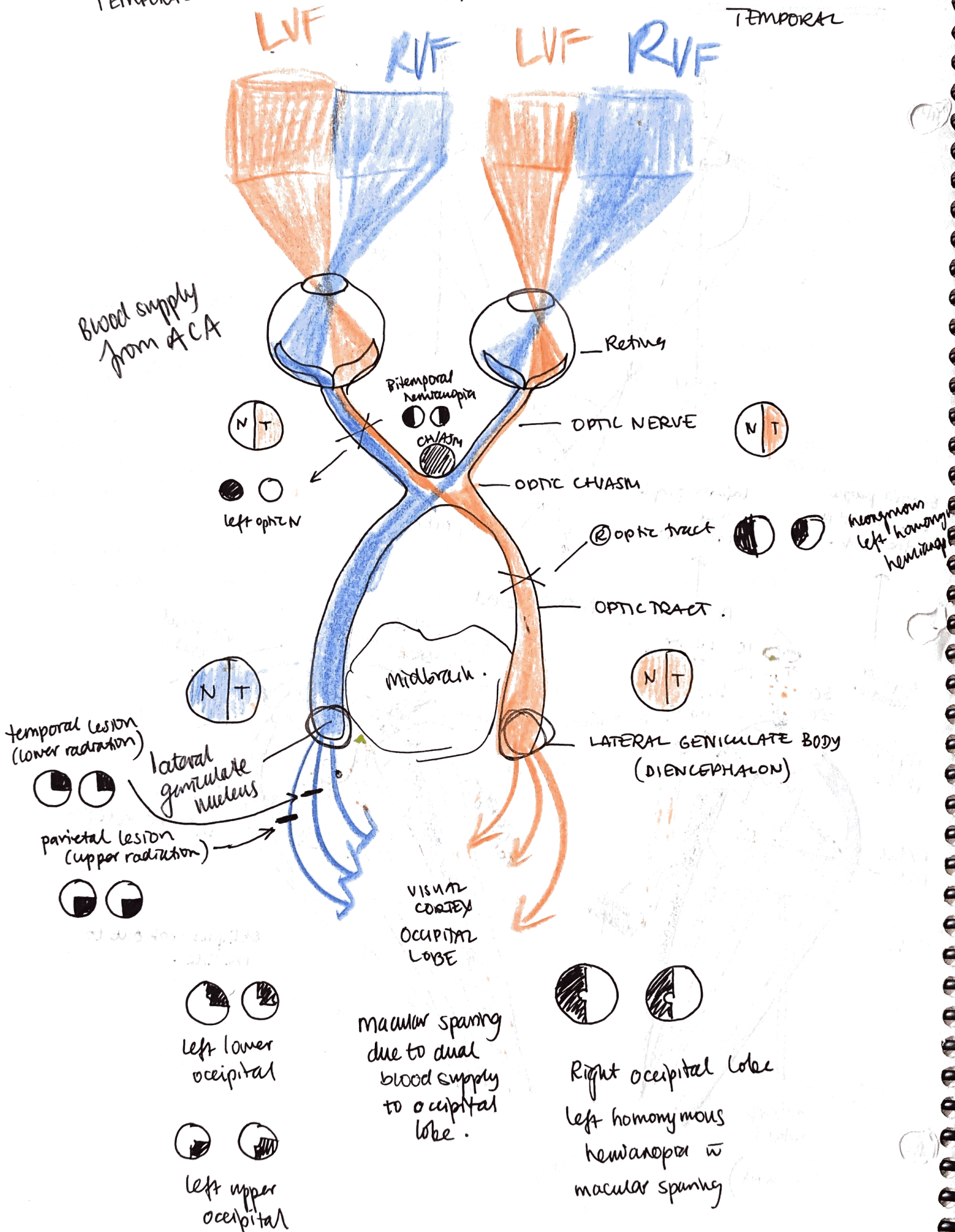


Superior people are allowed in the club.

Inferior people can be extorted.

Muscles + movement





TRIGEMINAL NERVE (CNV) - Sensory innervation of the face. + swallowing

Charlotte Durand
acemprimarypodcast.com

ORIGIN: PONS

- 4 above 1-IV
- 4 in V-VIII
- 4 below IX-XII

Motor & sensory component
motor to muscles of mastication

→ 5 branches
2 sympathetic + sensory.

ciliary ganglion in the bony orbit.
→ PS to iris (sphincter) + accommodation
→ S to iris dilator
Fibres from edinger westphal nucleus (CNVIII)

supraorbital

Ophthalmic nerve CNV₁

- smallest division
- arises from trigeminal ganglion
- goes via supraorbital fissure

pterygopalatine ganglion

PS - lacrimal gland secretomotor
S - vessels in nasal cavity, palate, pharynx, mucous glands.

maxillary nerve CNV₂

- sensory only
- via foramen rotundum (in greater wing of sphenoid) MAXIMALLY ROTUND
- enters pterygopalatine fossa

Mandibular nerve CNV₃

- largest division, only one is motor
- sensory fibres from trigeminal ganglion, PLUS motor fibres
- combine in the foramen ovale (greater wing of sphenoid)
- muscles of mastication
- deep to parotid gland

submandibular ganglion

PS: glands
S: glands.

Innervation of the tongue

Taste sensations:

Anterior 2/3 via facial nerve from chorda tympani.

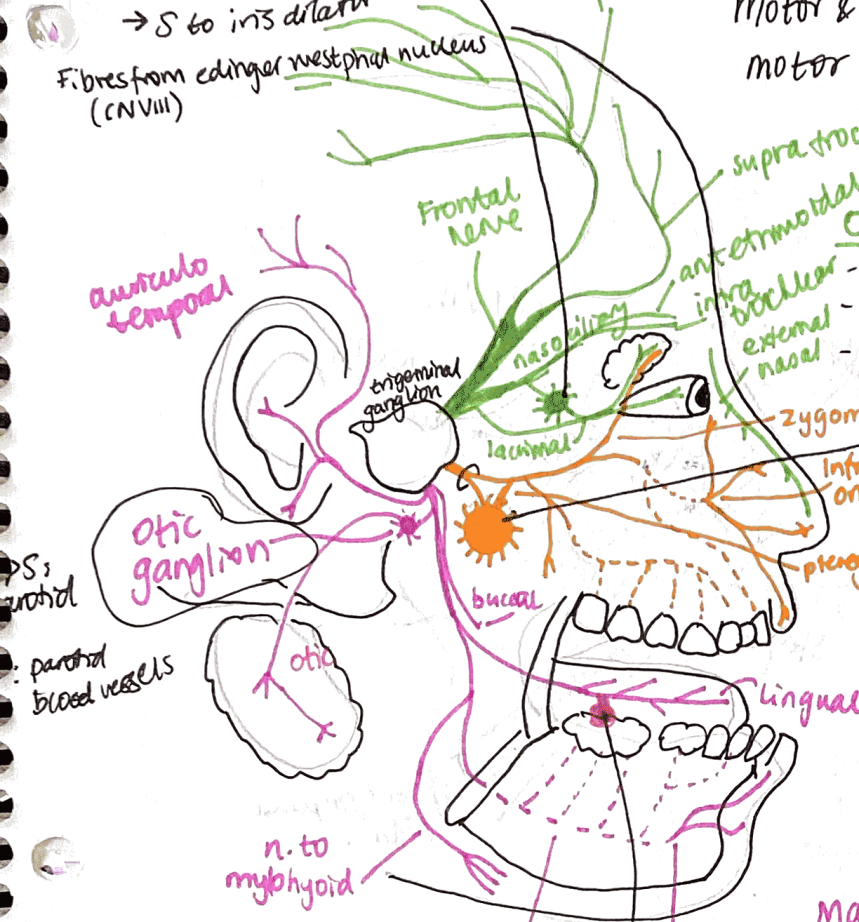
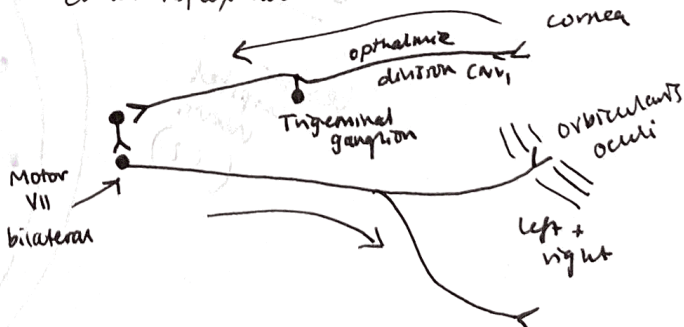
Touch + temperature: lingual nerve (CNV₃)

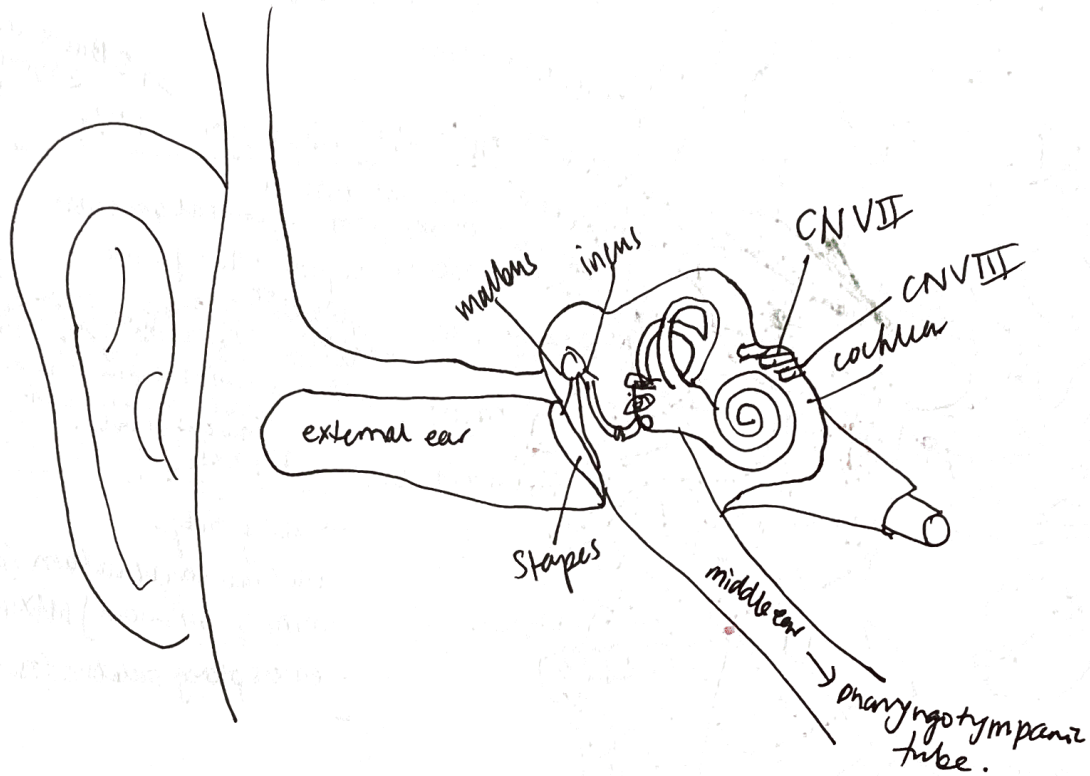
Anterior 2/3

Posterior 1/3 both taste + touch/temp via glossopharyngeal.

± some vagus to post 1/3.

corneal reflex via CNV & CNVII





lymphatic drainage

Lateral surface superior $\frac{1}{2}$ = Superficial parotid nodes
 cranial surface " = mastoid nodes + deep cervical
 Rest = superficial cervical.
 Tube = deep cervical

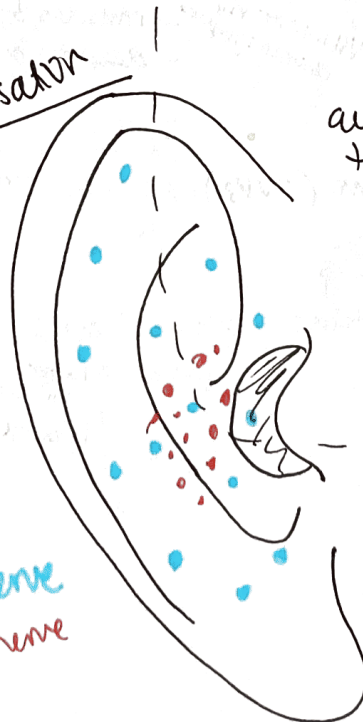
Cutaneous sensation

lesser occipital nerve (C2)

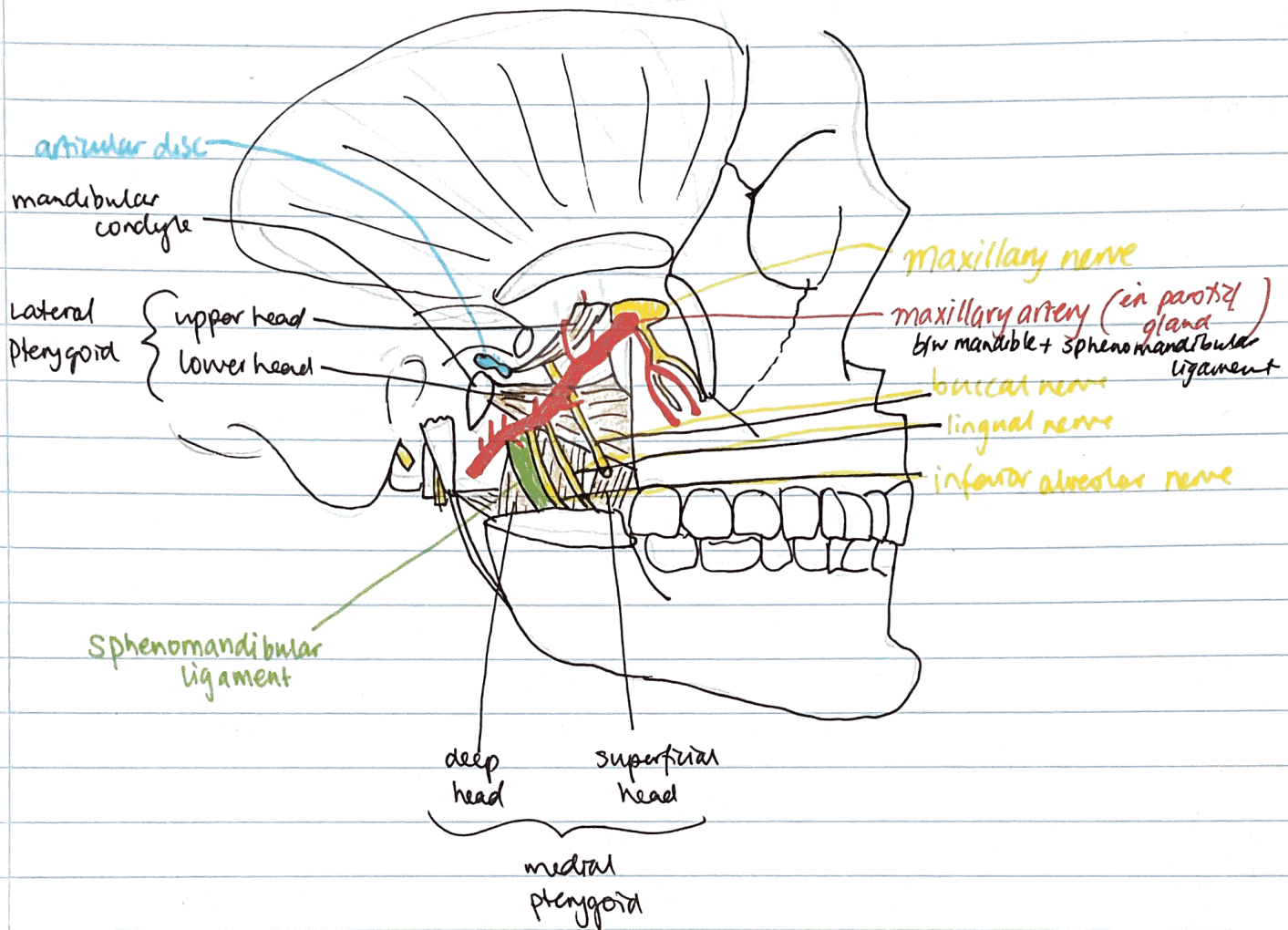
auriculo temporal branch of (V3) mandibular nerve.

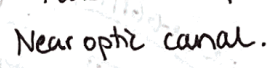
● Facial nerve
 ● Vagus nerve

Great Auricular nerve
 C2, C3

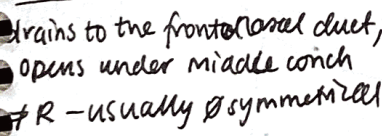


Infratemporal fossa - below + medial to zygomatic arch





In the sphenoid bone - formed by spread of ethmoidal cells from 2 yrs

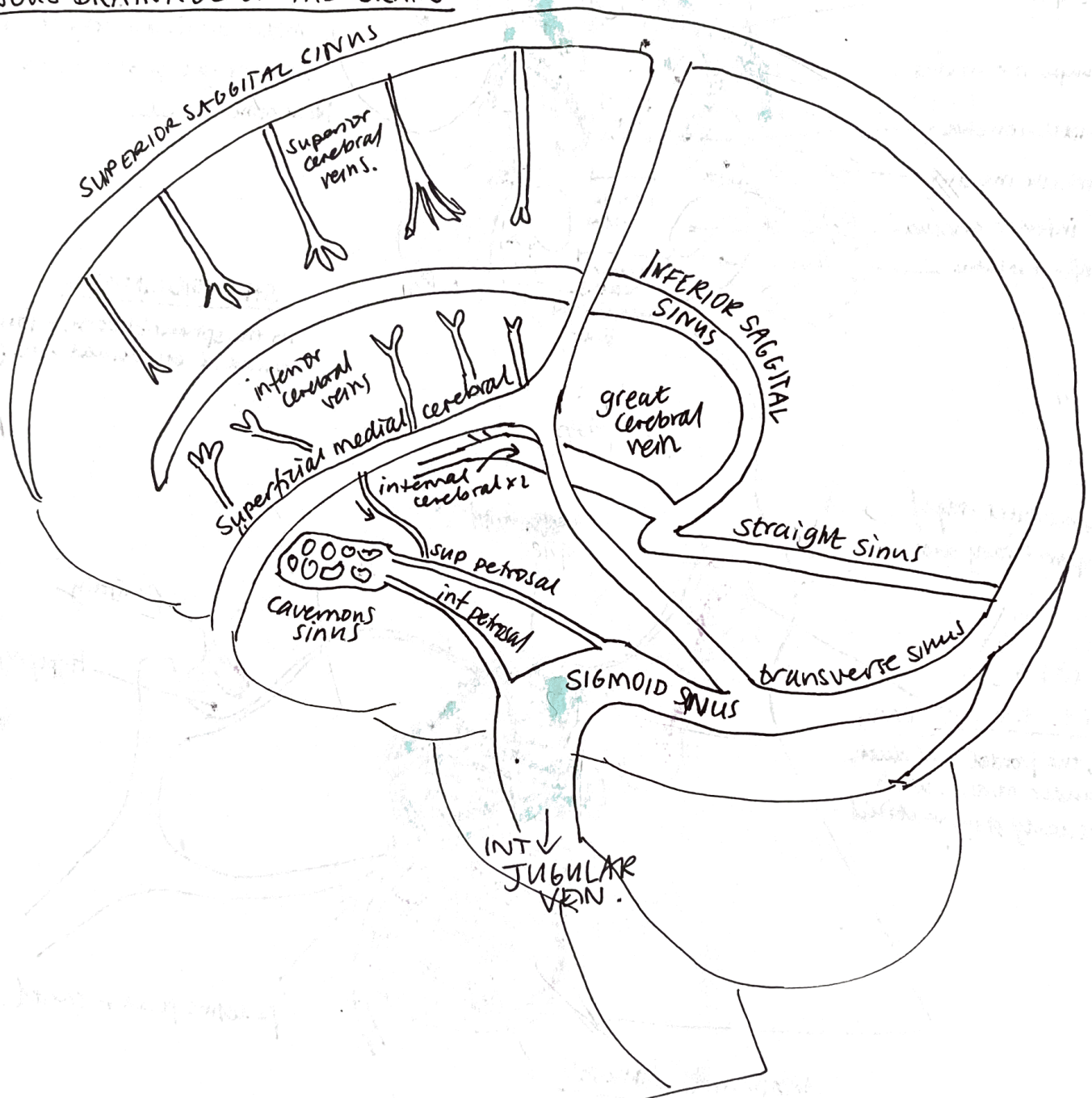


In front of pterogopalethine fossa

Internal Carotid artery

→ carotid plexus carries post ganglionic sympathetic fibres from superior cervical ganglion to the dilator pupillae.

VENOUS DRAINAGE OF THE BRAIN

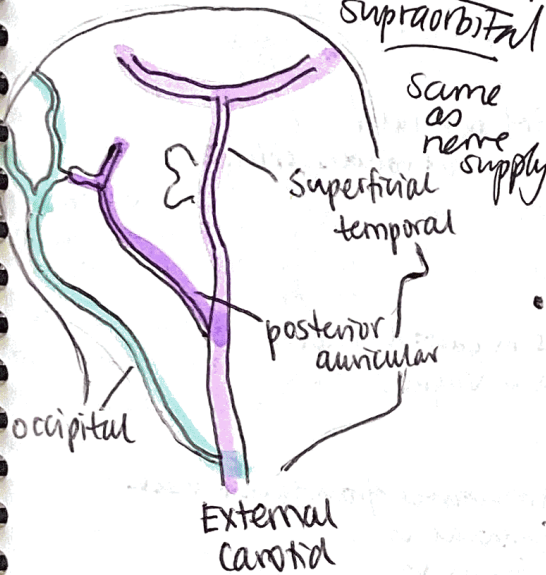


7. THE SCALP

Skin, Connective tissue, Aponeurosis, Loose areolar connective tissue, Periosteum + vessels

Vascular Supply

- External carotid
- 3 branches



Venous Drainage

(Valveless + connected to dural venous sinuses)

• Superficial Region

- follows arteries
- superficial temporal
- occipital
- posterior auricular
- supraorbital
- supratrochlear

• Deep Region

- pterygoid venous plexus
- ↳ B/w temporalis & lateral pterygoid muscles
- drains into maxillary vein

TRIGEMINAL

Zygomatico temporal (temple)

Supra trochlear
Supra orbital

auriculo temporal

SCALP INNERVATION

VERTEBRAL

great auricular (C2, C3)

lesser occipital (C2)

Third occipital (inferior occipital region) (C3)

greater occipital (C2)

CERVICAL NERVES

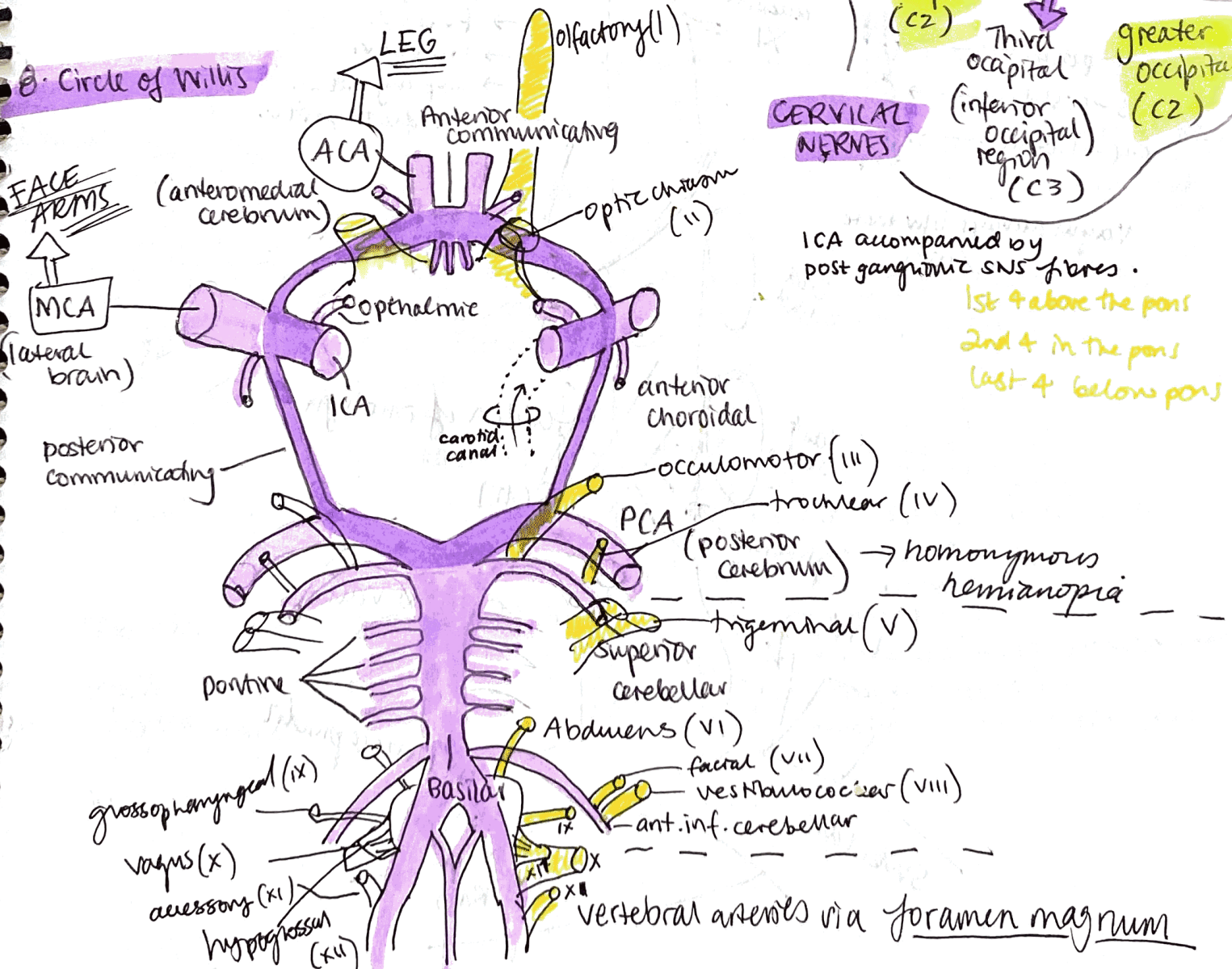
ICA accompanied by post ganglionic SNS fibres.

1st 4 above the pons

2nd 4 in the pons

last 4 below pons

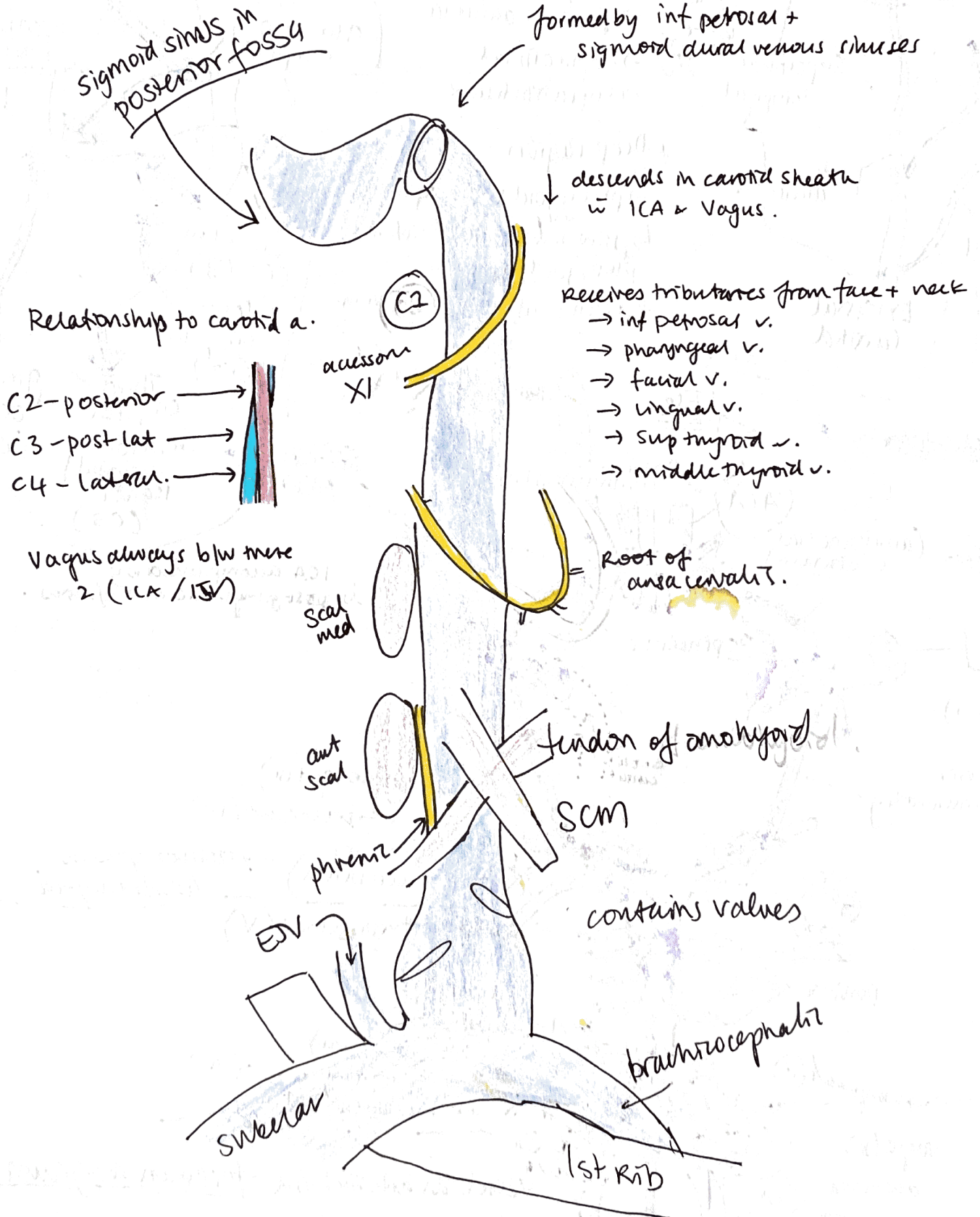
Circle of Willis



Facial vein

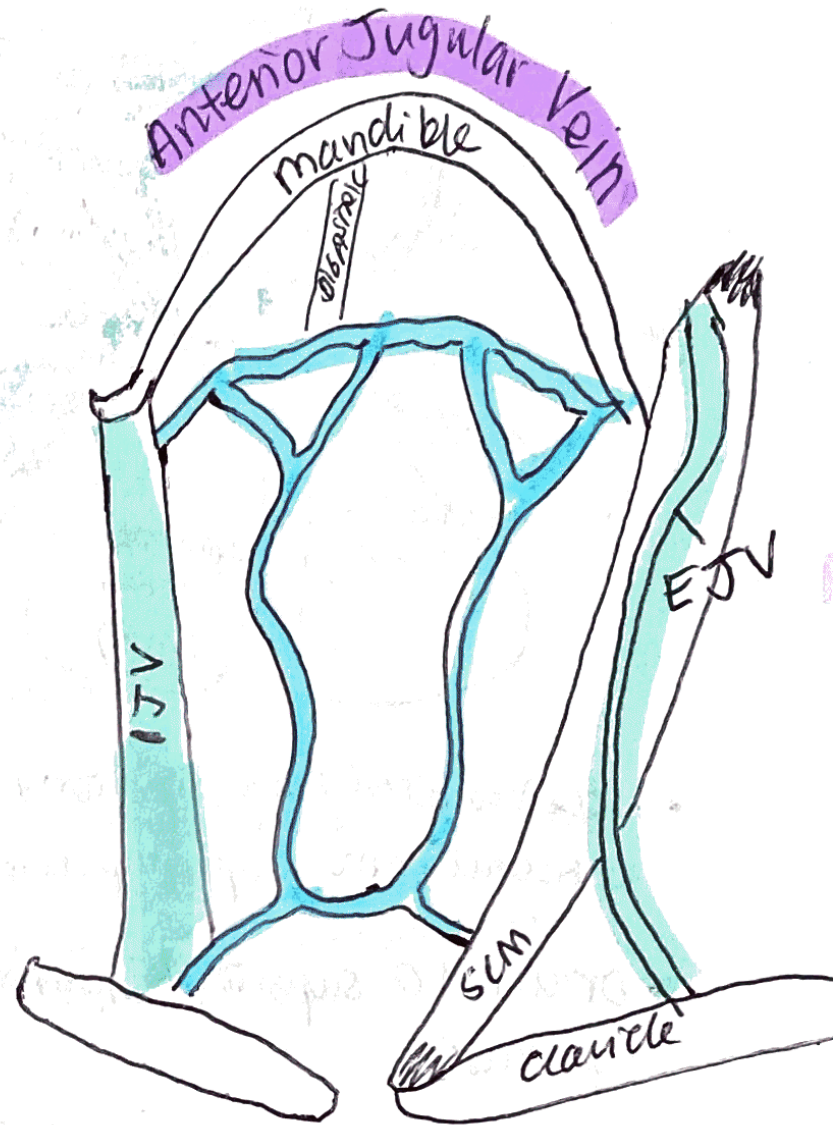
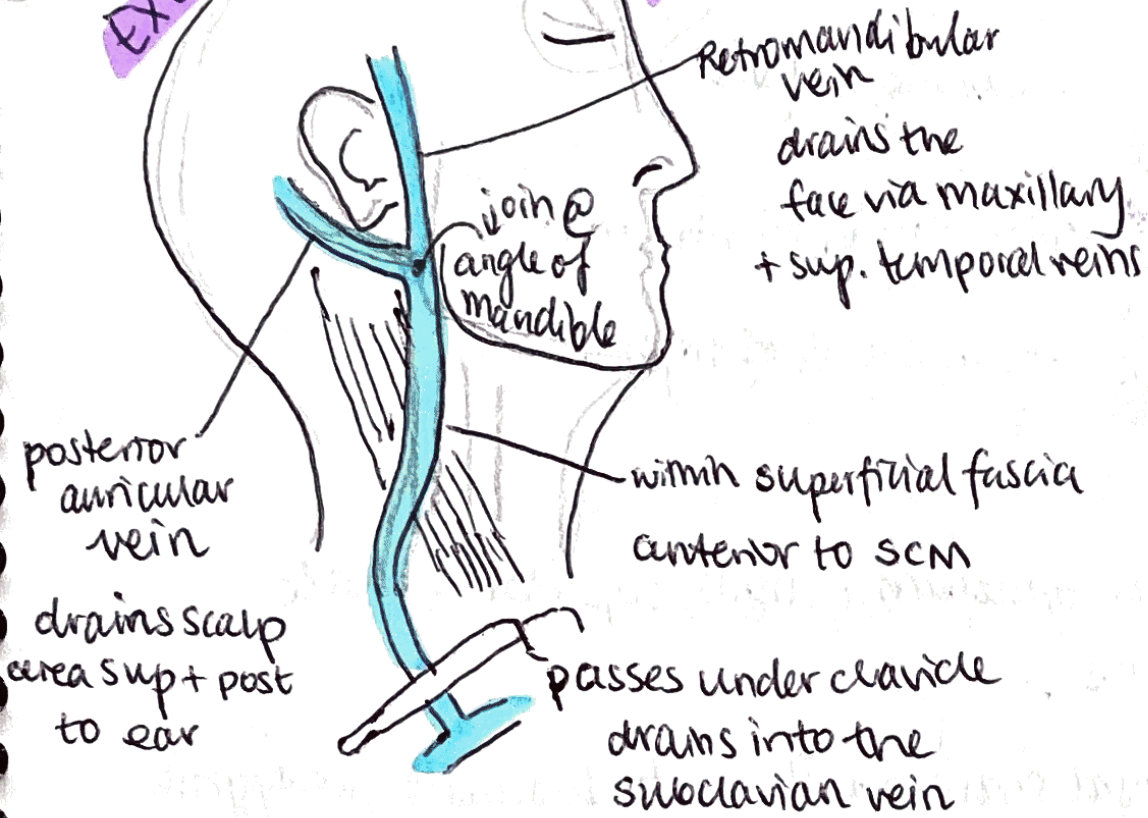
- No valves
- communicates w cavernous sinus via ophthalmic vein
- drains to internal jugular vein
- sits behind facial artery.

course of the IJV

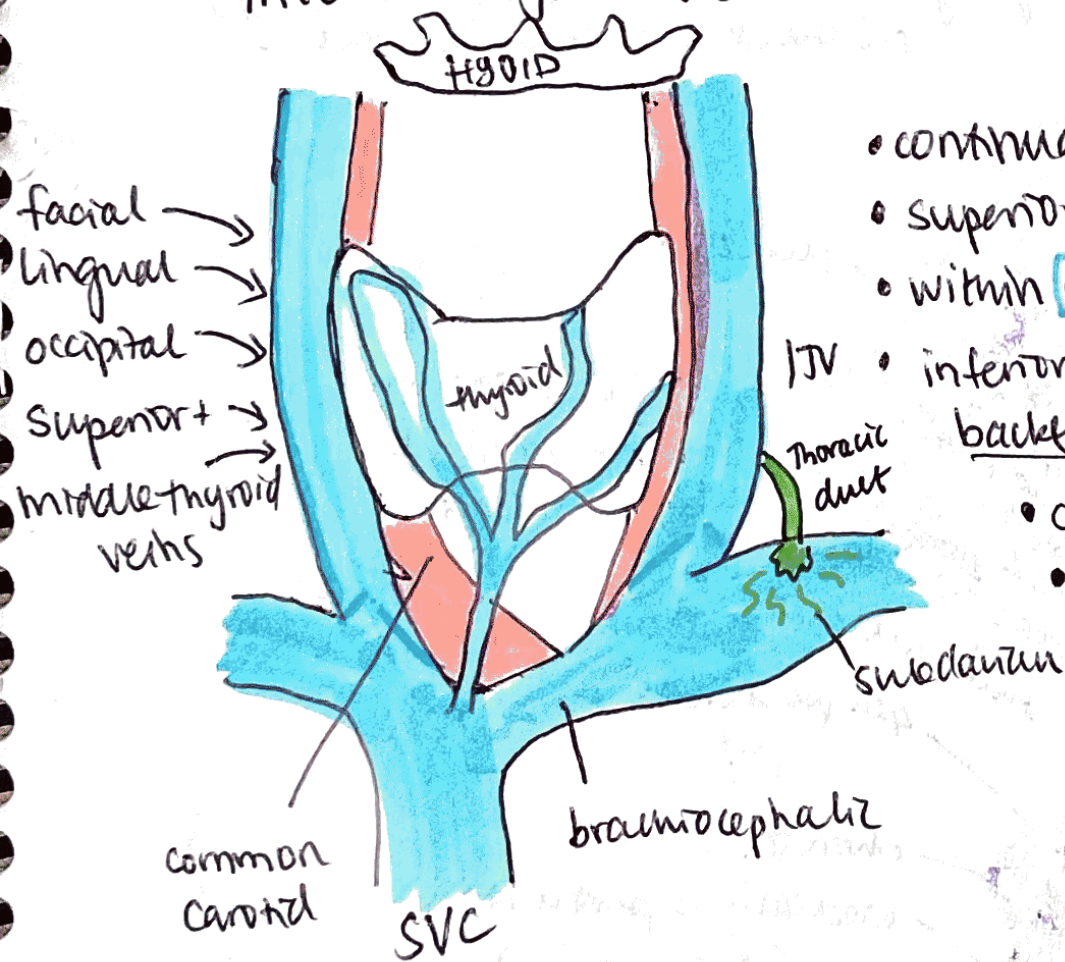


Venous Drainage of the face / head

External Jugular vein



Internal Jugular vein



- continuation of the sigmoid sinus
- superior bulb is 1st portion
- within carotid sheath (deep to SCM) — thinnest portion of sheath.
- inferior bulb before subclavian — valve to prevent backflow of blood.
- crossed anteriorly by anterior nerve.
- goes b/w heads of SCM

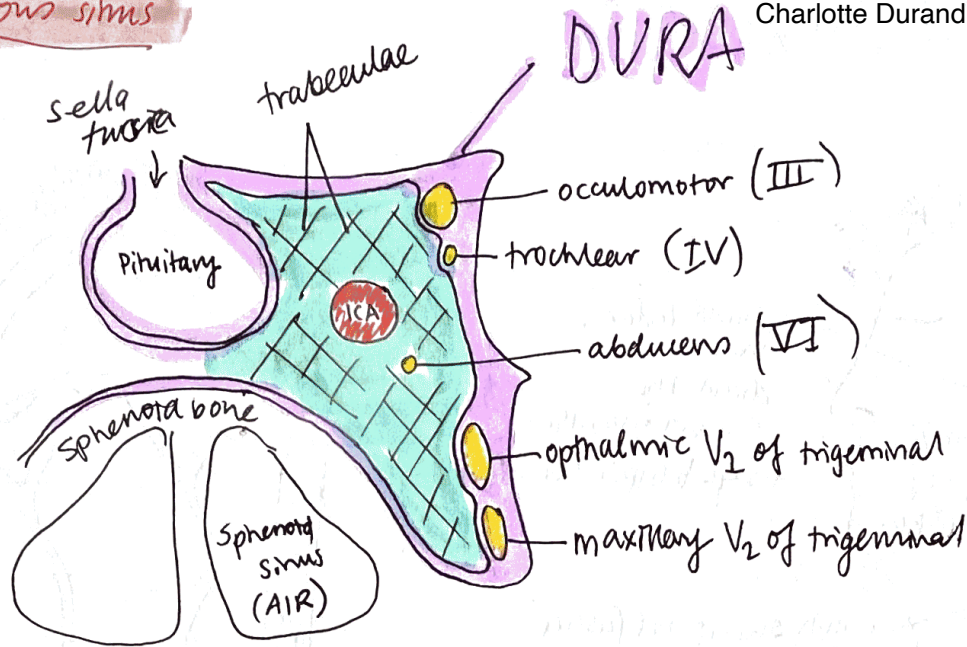
★ CEREBRAL VEINS ★

- cerebral veins lie in the sub arachnoid space.
- thin walled.
- NO VALVES
- pierce arachnoid → drain into cranial venous sinus.
- does not follow arterial pattern.

Medical Schools let Confident People In

Middle Thyroid Sup Thyroid Lingual CN VII Pharyngeal Inferior petrosal sinus



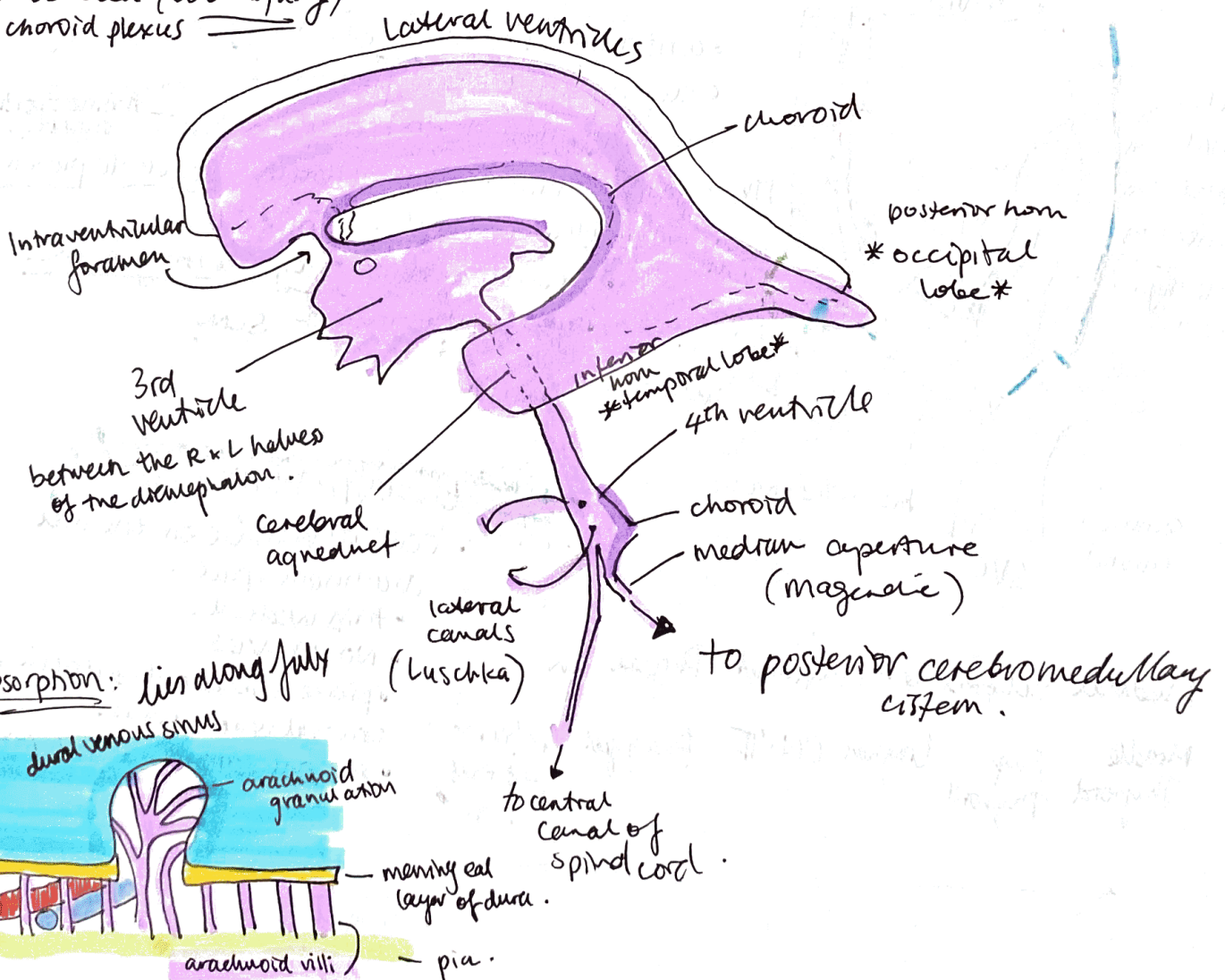


- Receives blood from superior + inferior ophthalmic veins, superior middle cerebral vein & sphenoparietal sinus.
- Drains to superior + inferior petrosal sinuses & then to basilar + pterygoid plexuses

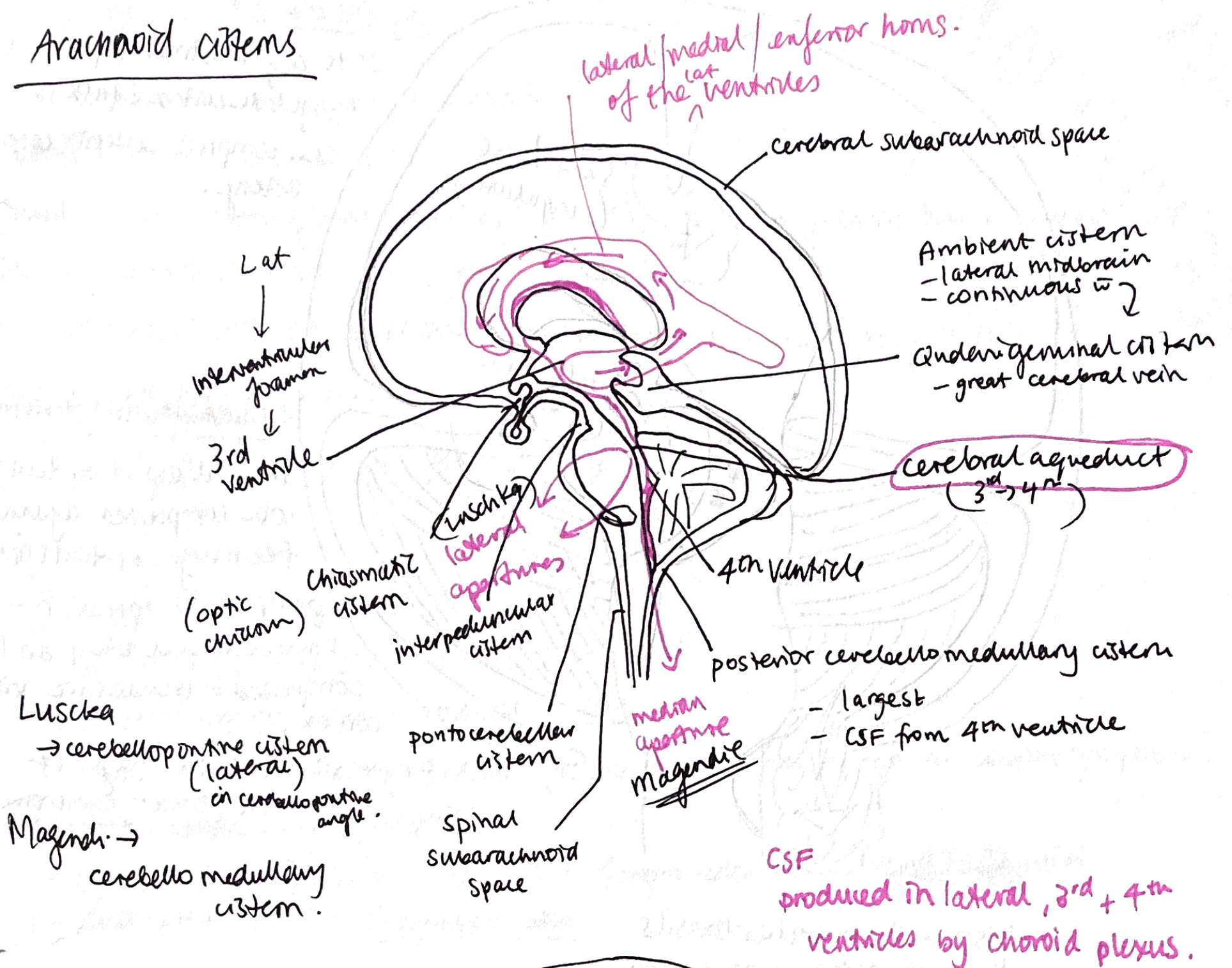
CSF Circulation

— the brain is only slightly heavier than CSF so gyri basal gyri sit on the skull base when erect.

CSF secreted (500mls/day) by choroid plexus

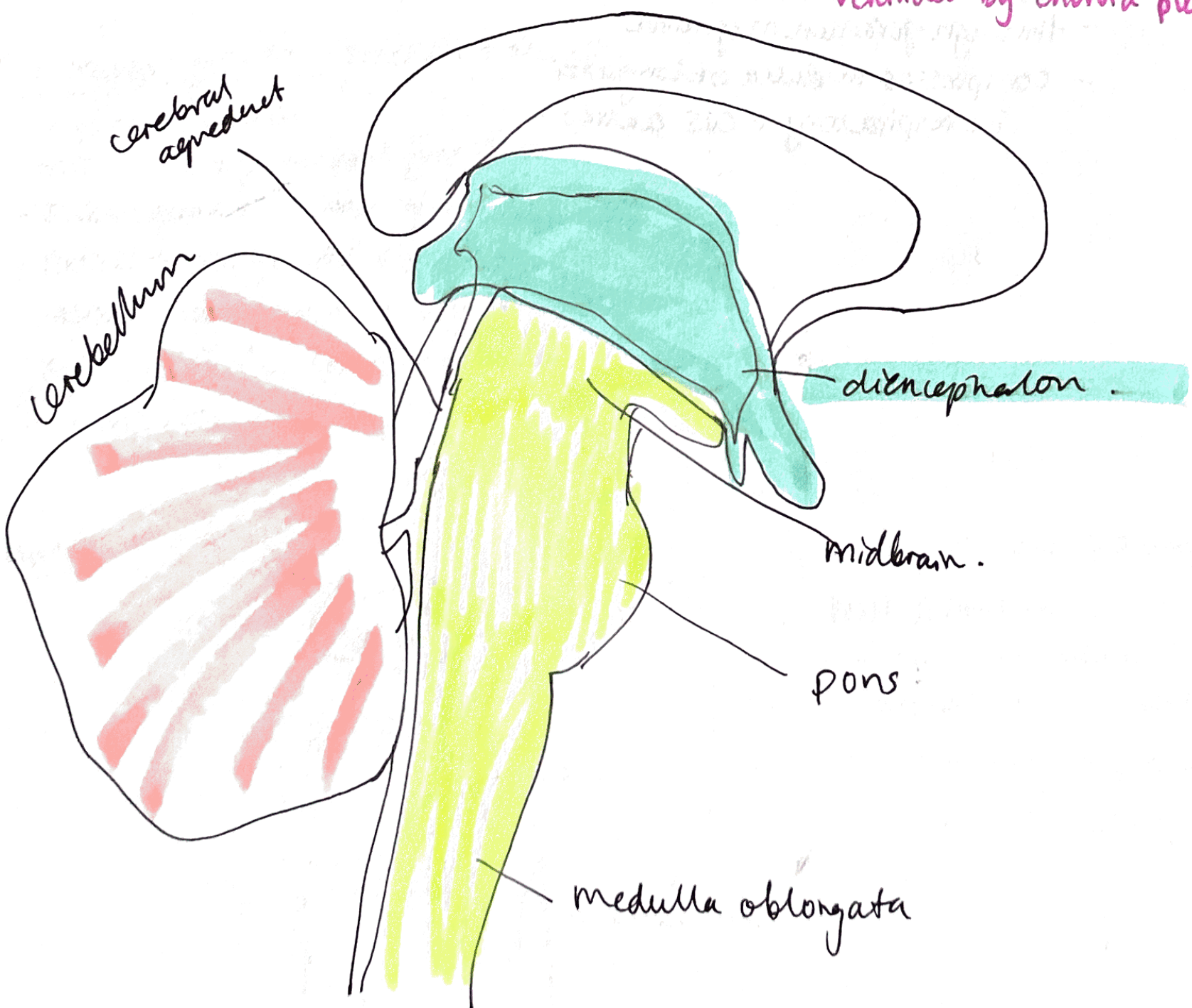


Arachnoid cisterns

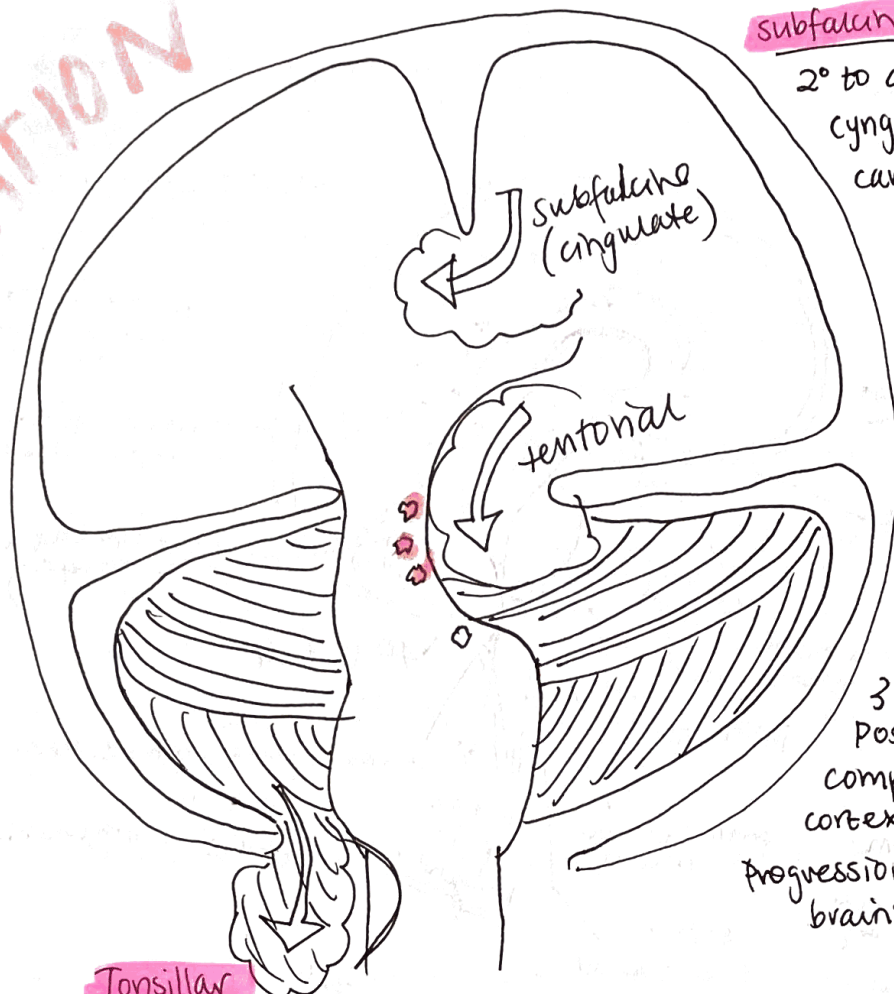


Luschka → cerebellopontine cistern (lateral) in cerebellopontine angle.

Magendie → cerebello medullary cistern.



BRAIN HERNIATION



subfalcine

2° to asymmetrical expansion
cingulate cortex ↓ falx cerebri
can compress anterior cerebral artery.

Transtentorial (uncinate)

medial aspect of temporal lobe compressed against free margin of tentorium.

3rd nerve compression
Post. cerebral artery can be compressed = ischaemic visual cortex.

Progression ⇒ haemorrhage of brainstem (Duret syndrome)

Tonsillar

- Displaced cerebellar tonsils
- through foramen magnum
- compresses medulla oblongata
i.e respiratory + CVS centres.

Parotid gland

- Extends above external acoustic meatus
- covers the mastoid ~~muscle~~
- Duct emerges from gland, runs in front of masseter + goes through buccinator
- Enters mouth at 2nd molar tooth (upper)
- Parasympathetic innervation from glossopharyngeal n. (CN IX)
- CN VII lies on the anteromedial surface of the gland.
- ~~is~~ supplied by the transverse facial artery branch of ECA

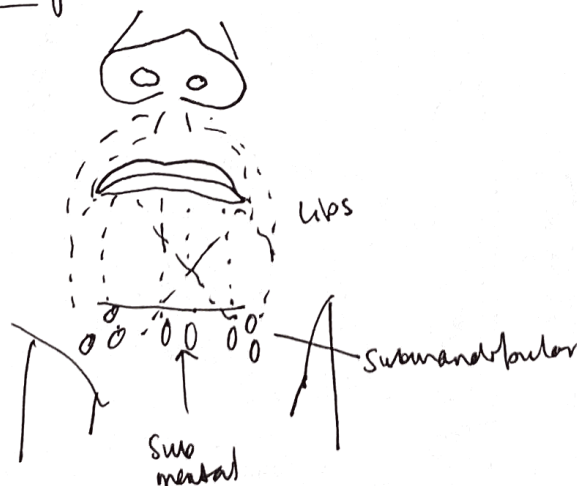
Submandibular glands (smallest?)

- lie along body of the mandible, 5cm duct
- arterial supply from submental arteries
- Innervated by parasympathetic fibres from chorda tympani, which synapse in the submandibular ganglion.
- Lymphatic drainage via deep cervical lymph nodes → jugular omohyoid
- duct opens near the frenulum base

Sublingual glands smallest + deepest.

- in floor of mouth
- horseshoe shape around frenulum
- sublingual + submental arteries
- Nerves = presynaptic PNS fibres via facial, chorda tympani + lingual nerves synapse in the submandibular ganglion

Lymphatic drainage

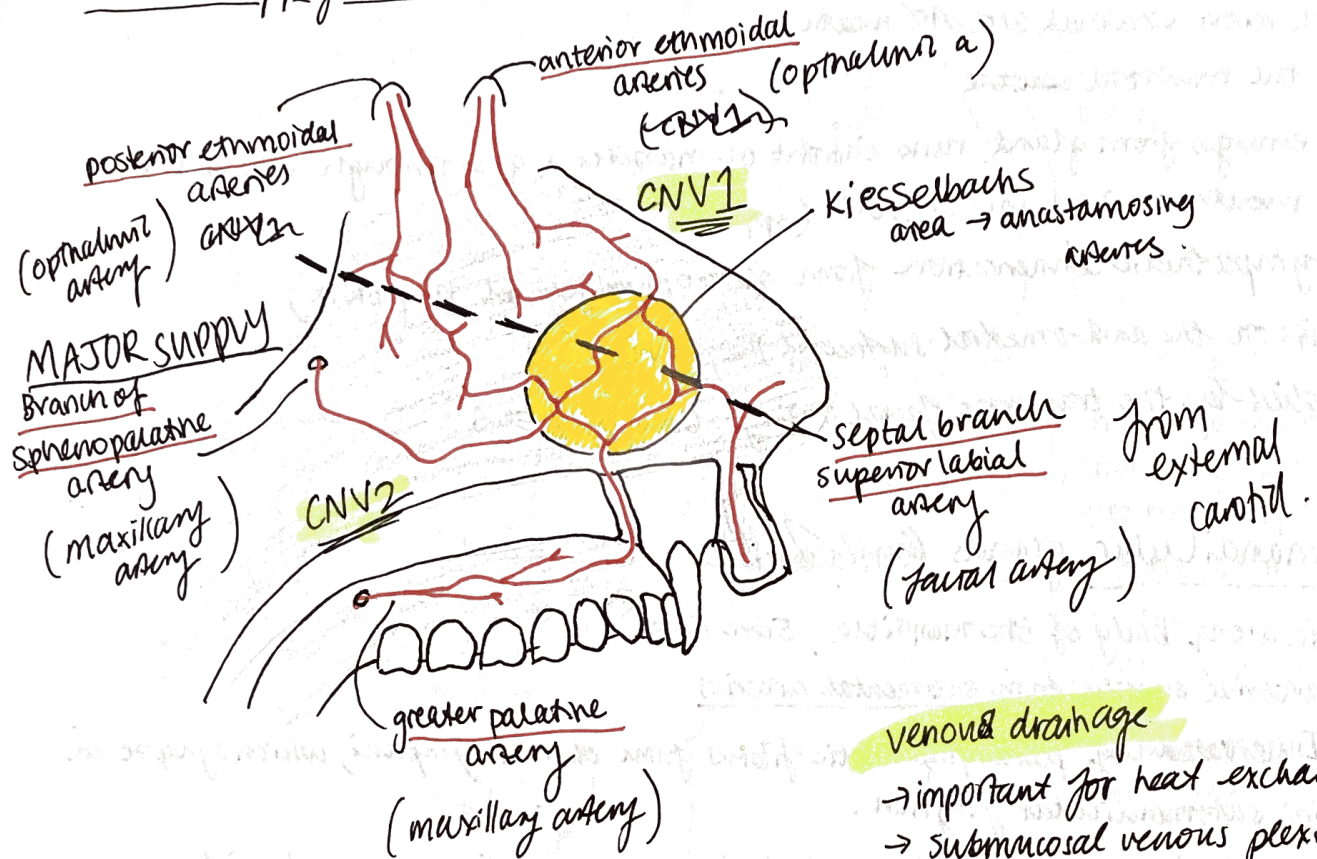


Tongue - drains 4 ways

MOST follows veins.

- root → sup. deep cervical nodes
- medial body → inferior deep cervical nodes
- lateral body → submandibular
- apex + frenulum, submental

Blood Supply to nasal septum



venous drainage

- important for heat exchange
- submucosal venous plexus
- external nose drains to facial vein — but in communication w/ dural venous (cavernous) sinuses: watch for thrombophlebitis

Lymphatic drainage follows veins.