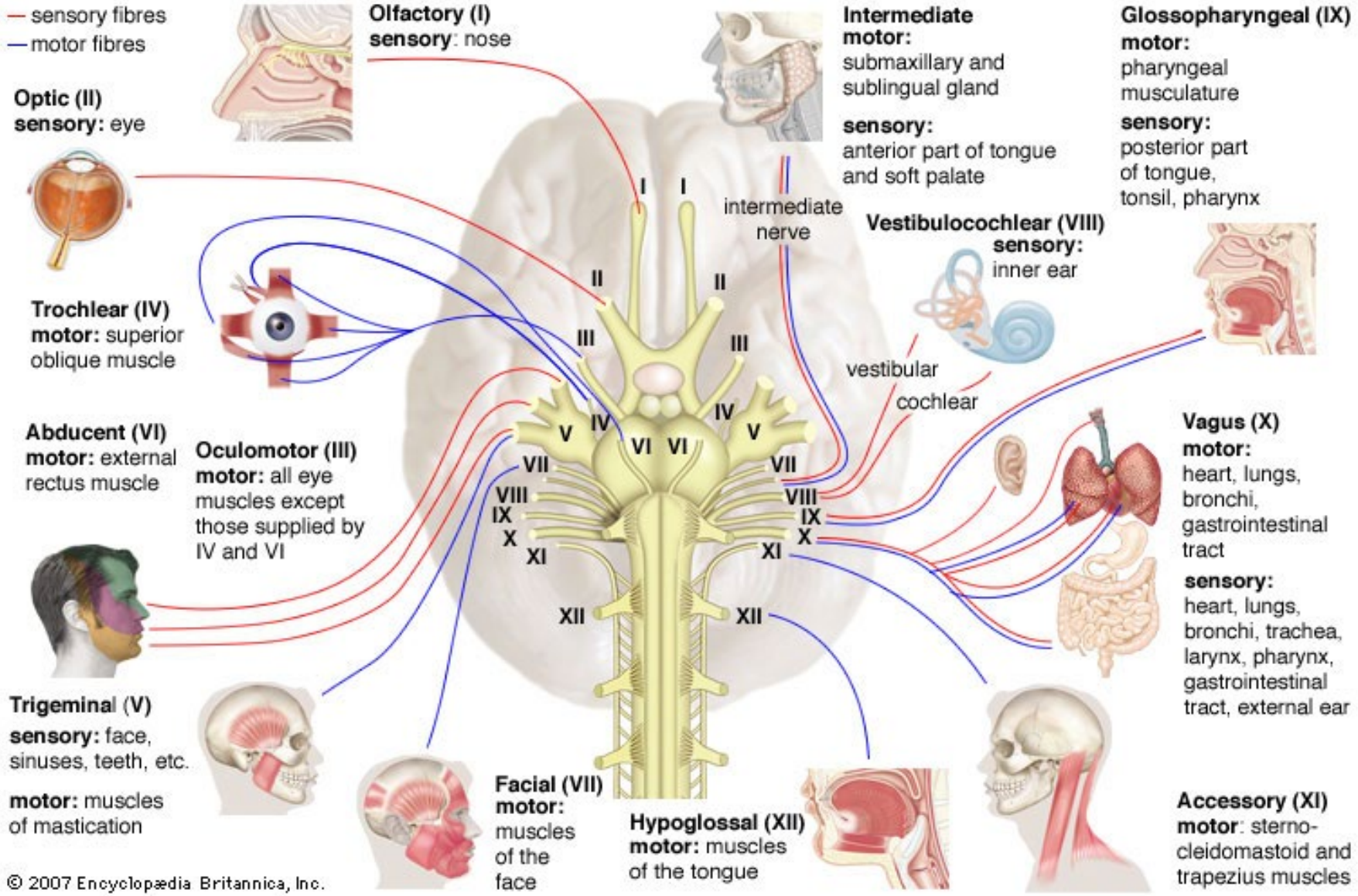
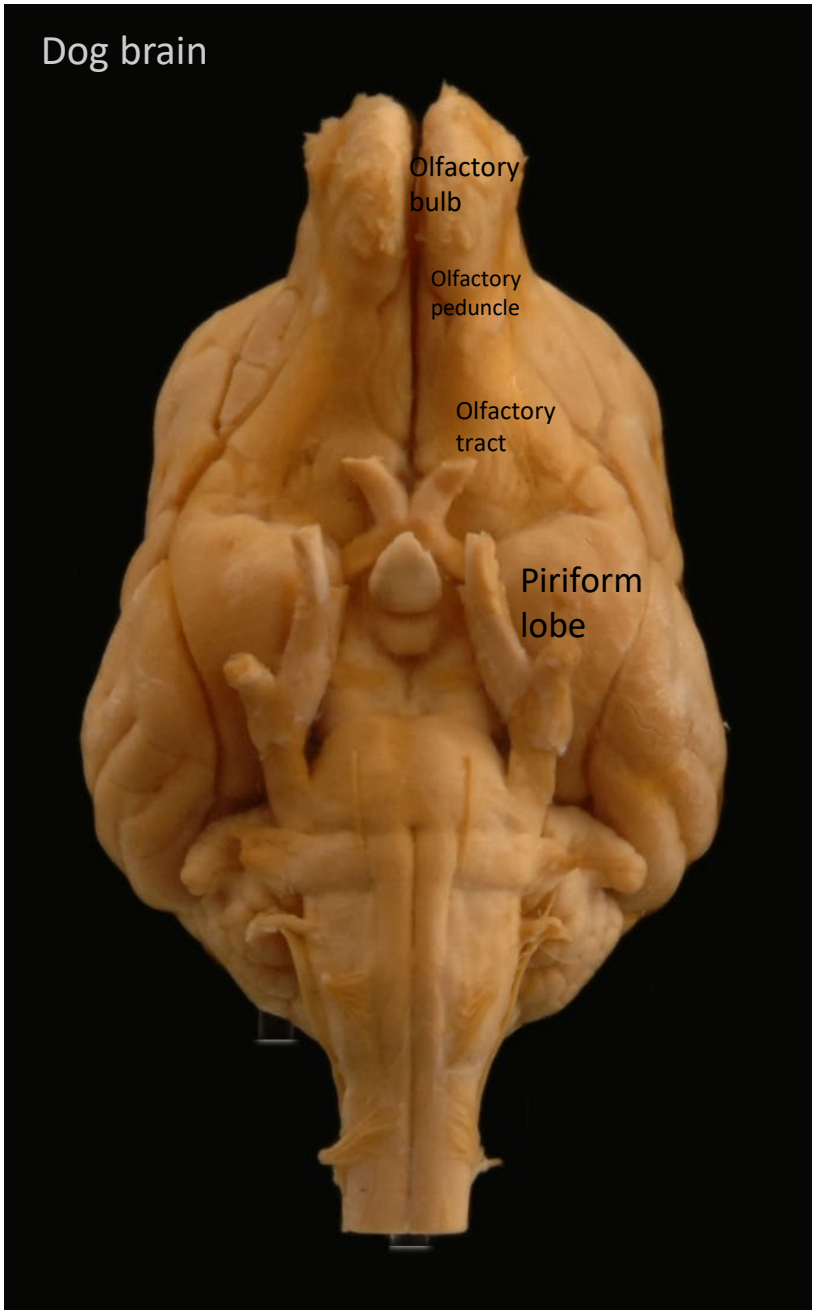
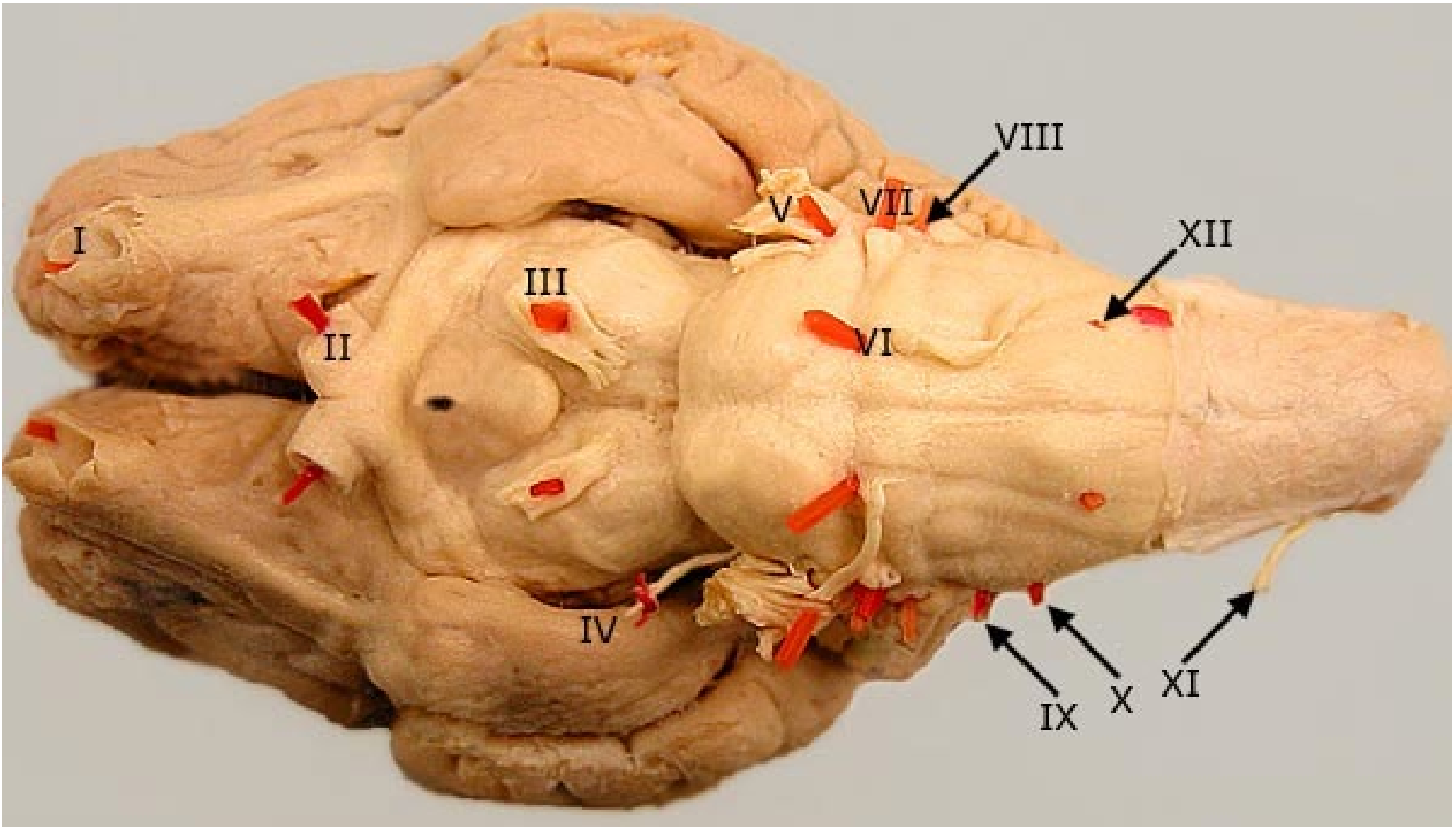
# MOŽDANI NERVI

| NAZIV NERVA | |
|---|---|
| I | Nn. OLFACTORII – senzoričan (čulo mirisa) |
| II | N. OPTICUS – senzoričan (čulo vida) |
| III | N. OCULOMOTORIUS – motoričan (mišići one jabučice) + parasimpatikus |
| IV | N. TROCHLEARIS - motoričan (mišići one jabučice) |
| V | N. TRIGEMINUS – mešovit nerv - senzibilan i motoričan (za mišiće žvakače) |
| VI | N. ABDUCENS - motoričan (mišići one jabučice) |
| VII | N. INTERMEDIO-FACIALIS – mešovit + parasimpatikus |
| VIII | N. VESTIBULOCOCHLEARIS – senzoričan (čulo sluha i ravnoteže) |
| IX | N. GLOSSOPHARYNGEUS – mešovit+ parasimpatikus |
| X | N. VAGUS – mešovit + parasimpatikus |
| XI | N. ACCESSORIUS – motoričan za mišiće vrata |
| XII | N. HYPOGLOSSUS – motiričan za mišiće jezika |

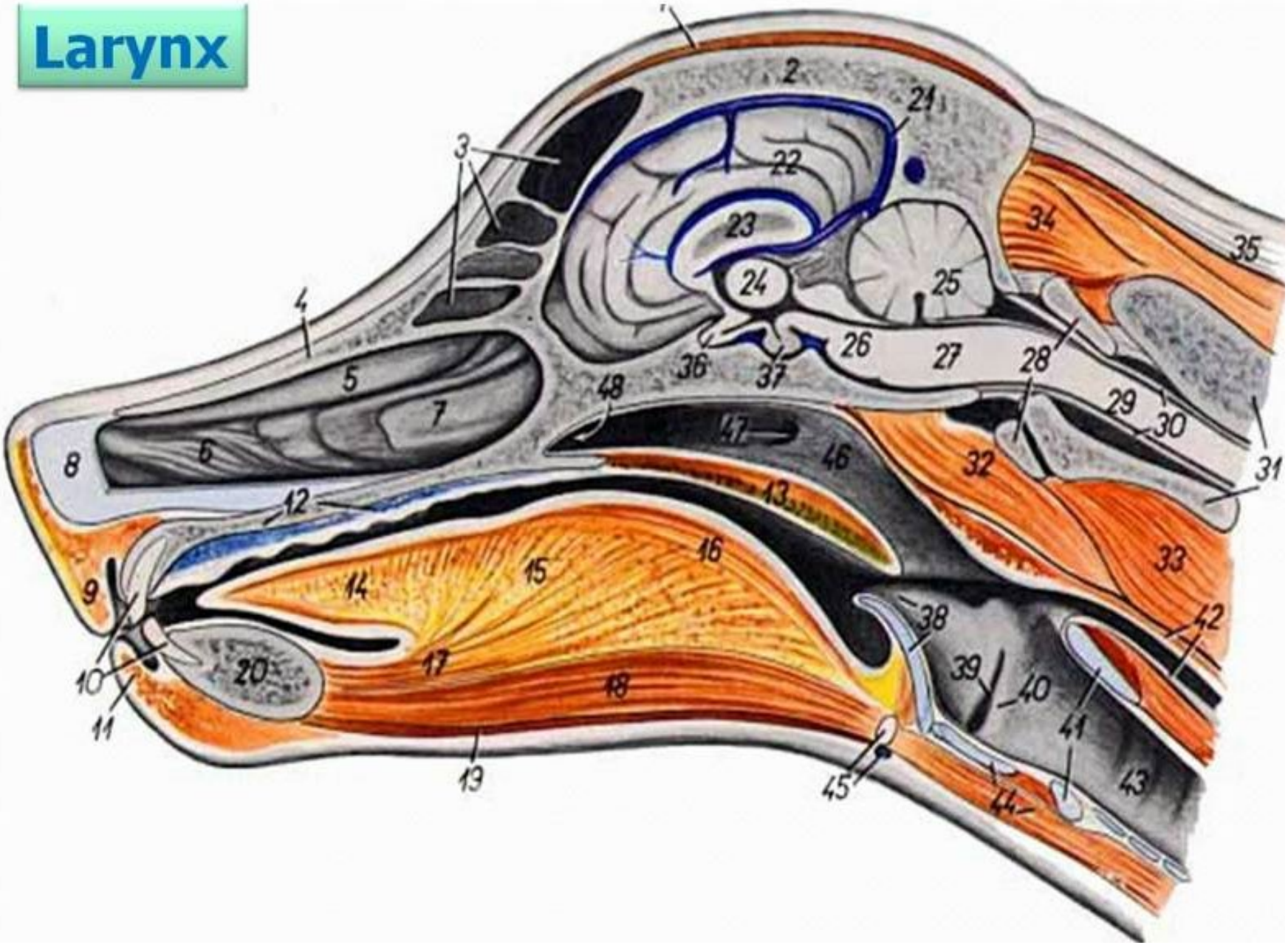


# Rhinencephalon


I
II
III
IV
V
VI
VII
VIII
XII
IX
X
XI

# Larynx


1
2
21
3
22
23
24
25
34
35
4
5
7
6
8
36
37
26
27
28
29
30
31
48
47
46
32
12
13
9
14
15
16
33
38
42
10
20
17
18
39
40
41
11
19
45
44
43

## Olfactory Epithelium

A catacomb at the back of the nasal passage houses sensory receptors.

| *Humans* | *Dogs* |
|---|---|
| **1 in²** surface area | **30 in²** surface area |
| **~6** million receptors | **~250** million receptors |

cross section

## Olfactory Bulb

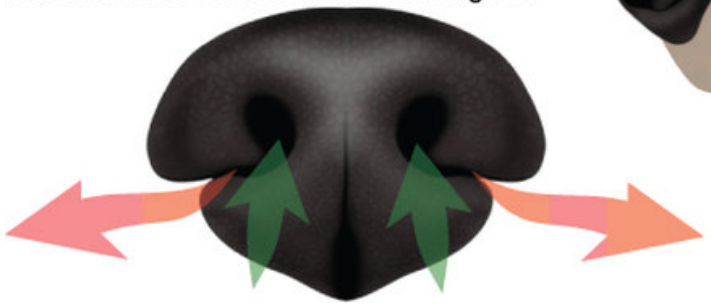
A brain region that processes signals from the olfactory epithelium. Canine olfactory bulbs are **3 times larger** than those of humans, even though their brains are **10 times smaller**.

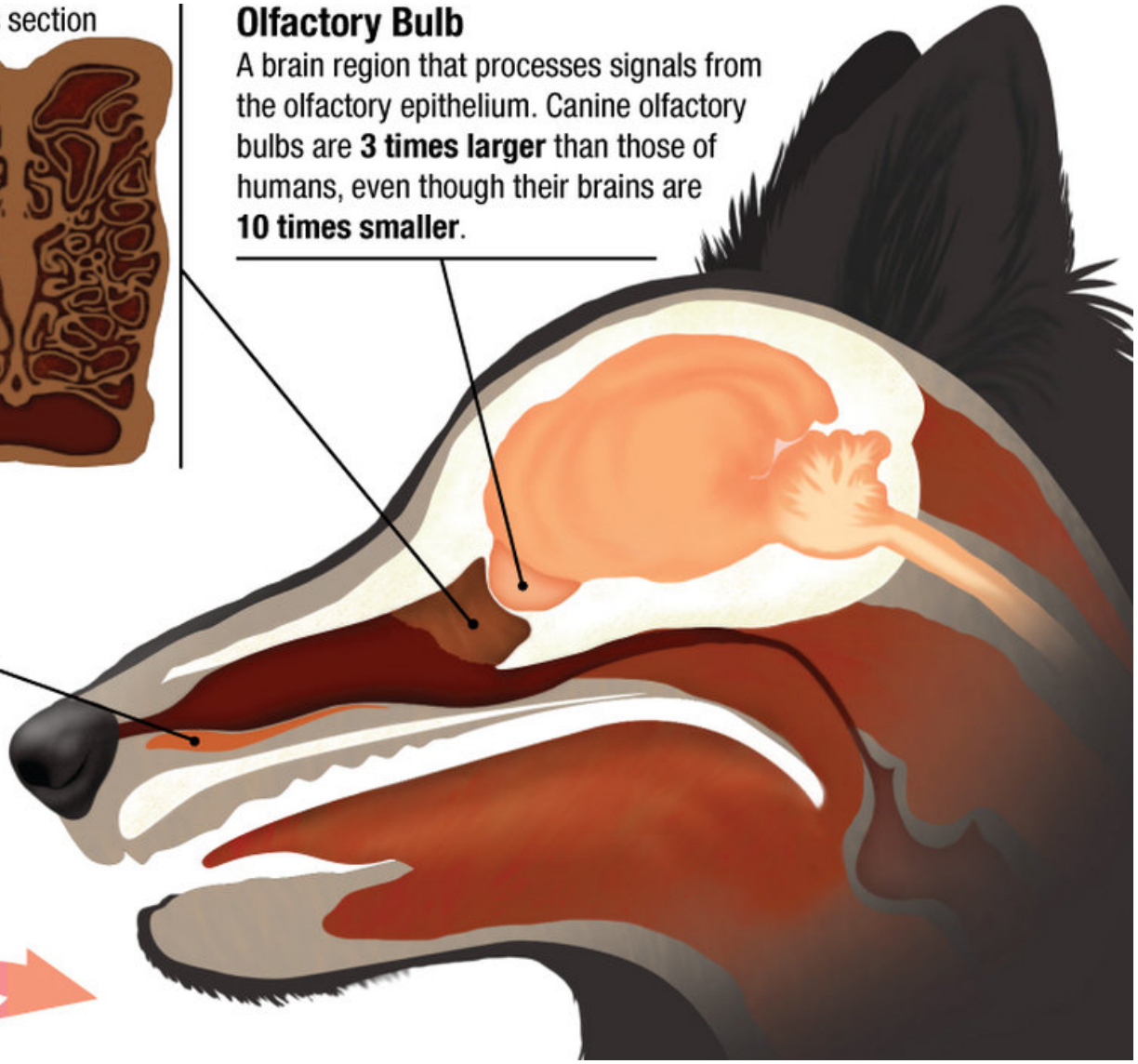
## Vomeronasal Organ

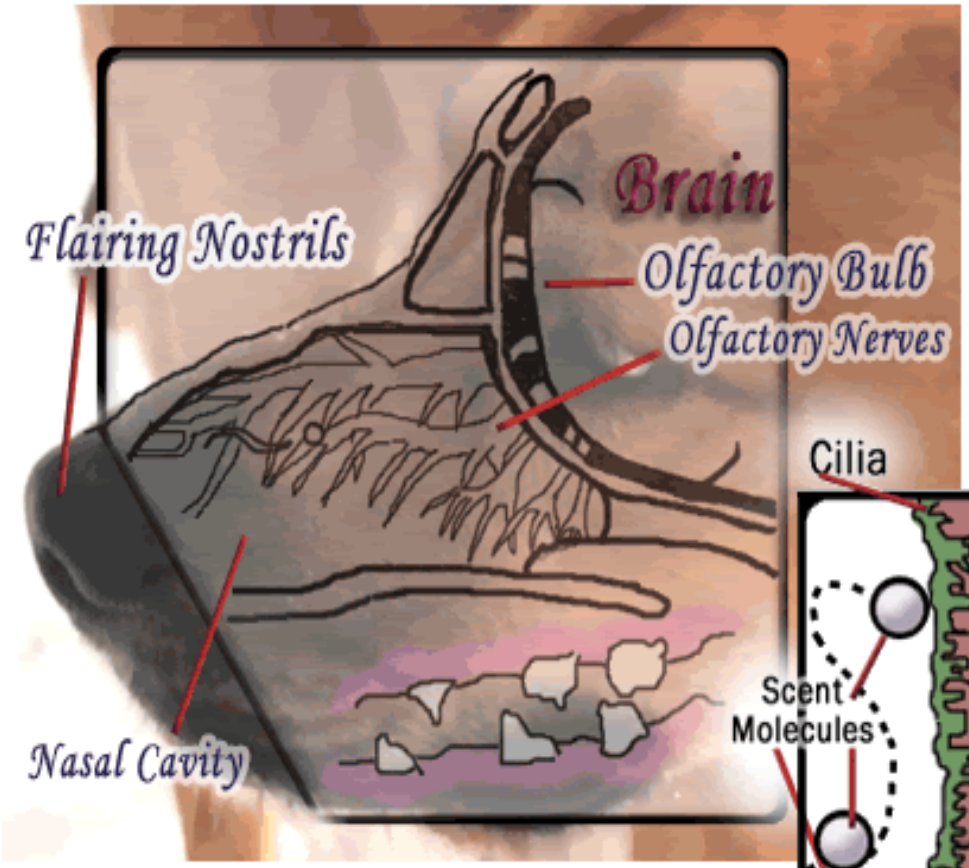
A sensory organ that detects pheremones picked up by a dog's wet nose.

## Nostrils

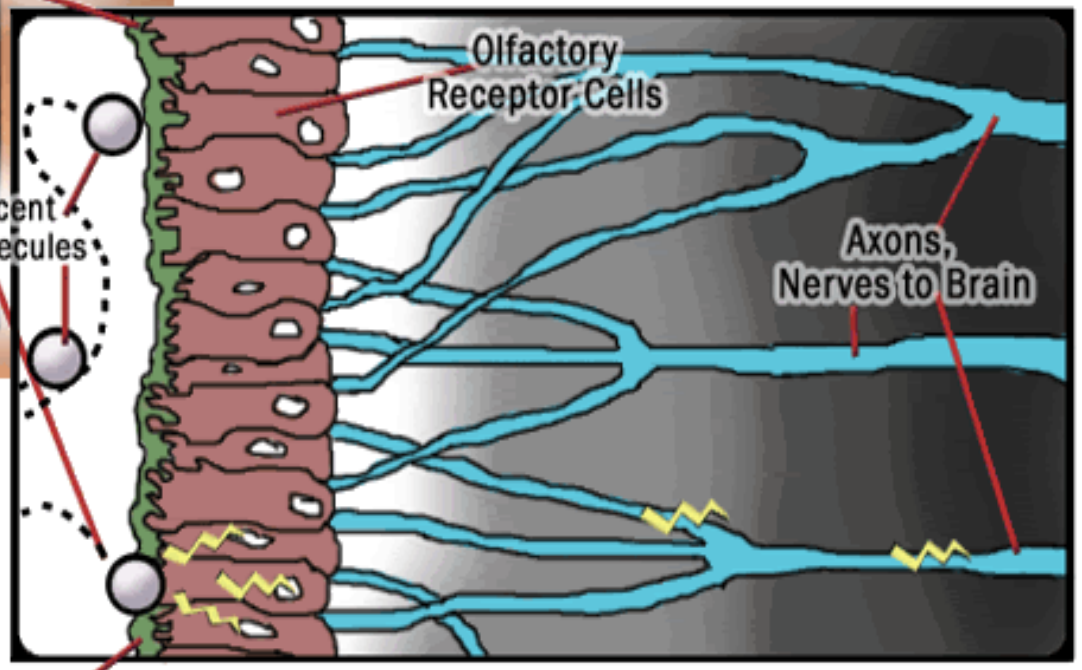
Air is exhaled through the side slits, so it doesn't dilute the scent of incoming air.







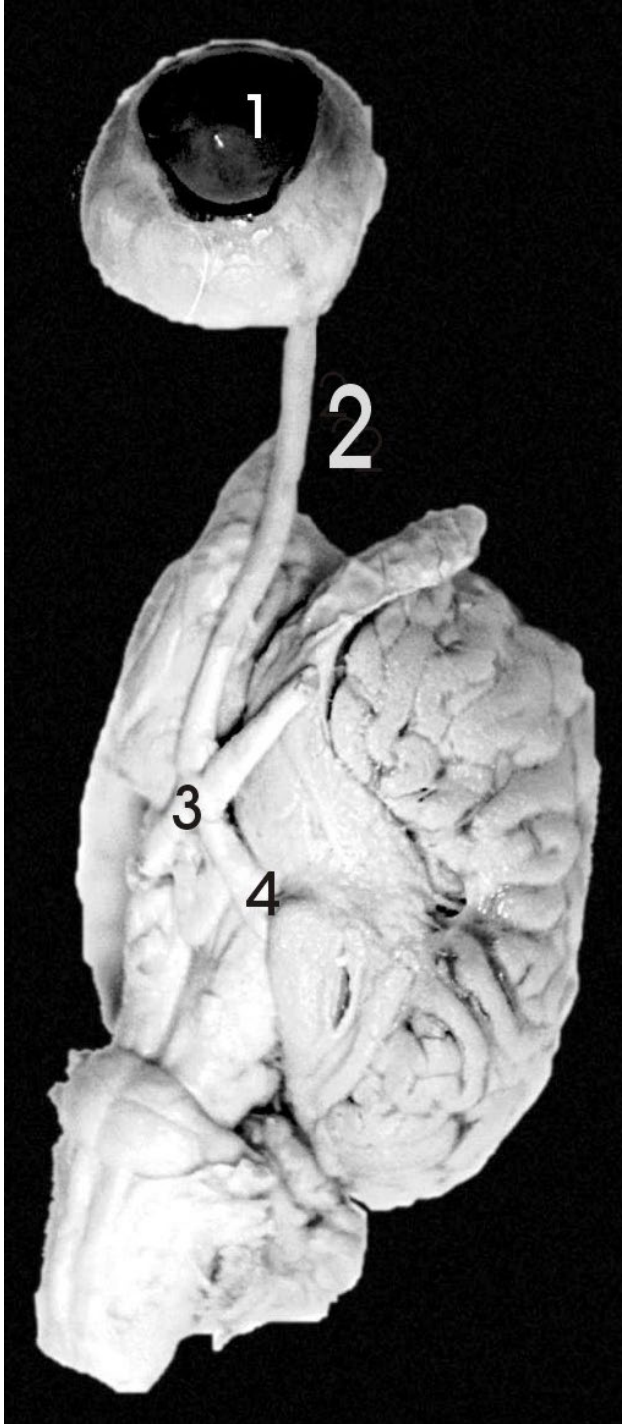

On top of each olfactory neuron are many hair-like cilia protruding into the moist surface layer of mucous. This stimulates the cells to send signals to the olfactory bulb in the brain, these signals are relayed from their to the olfactory cortex.



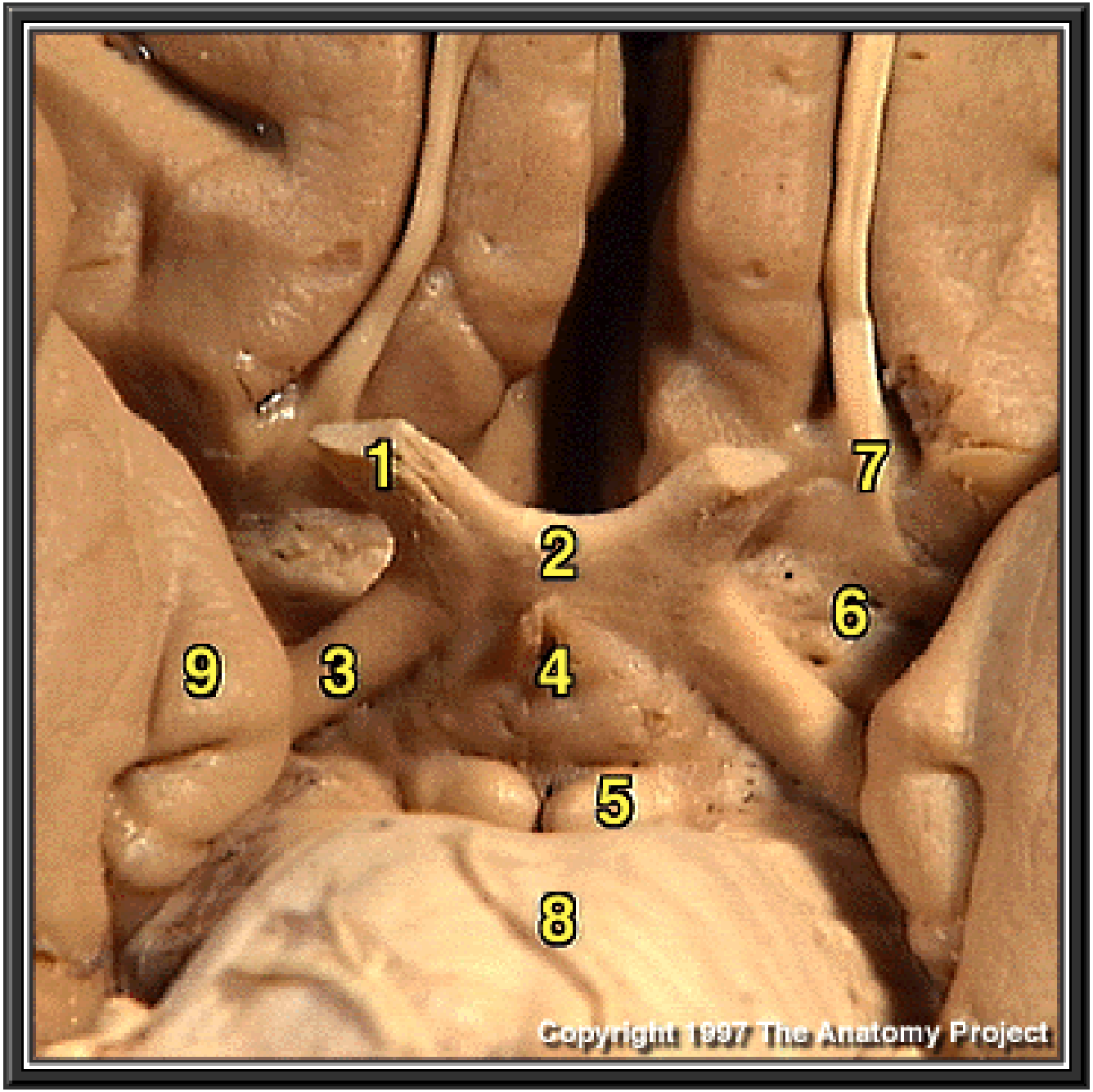

The length of a dogs nose determines how many olfactory nerves they have, and thus how well they can smell.

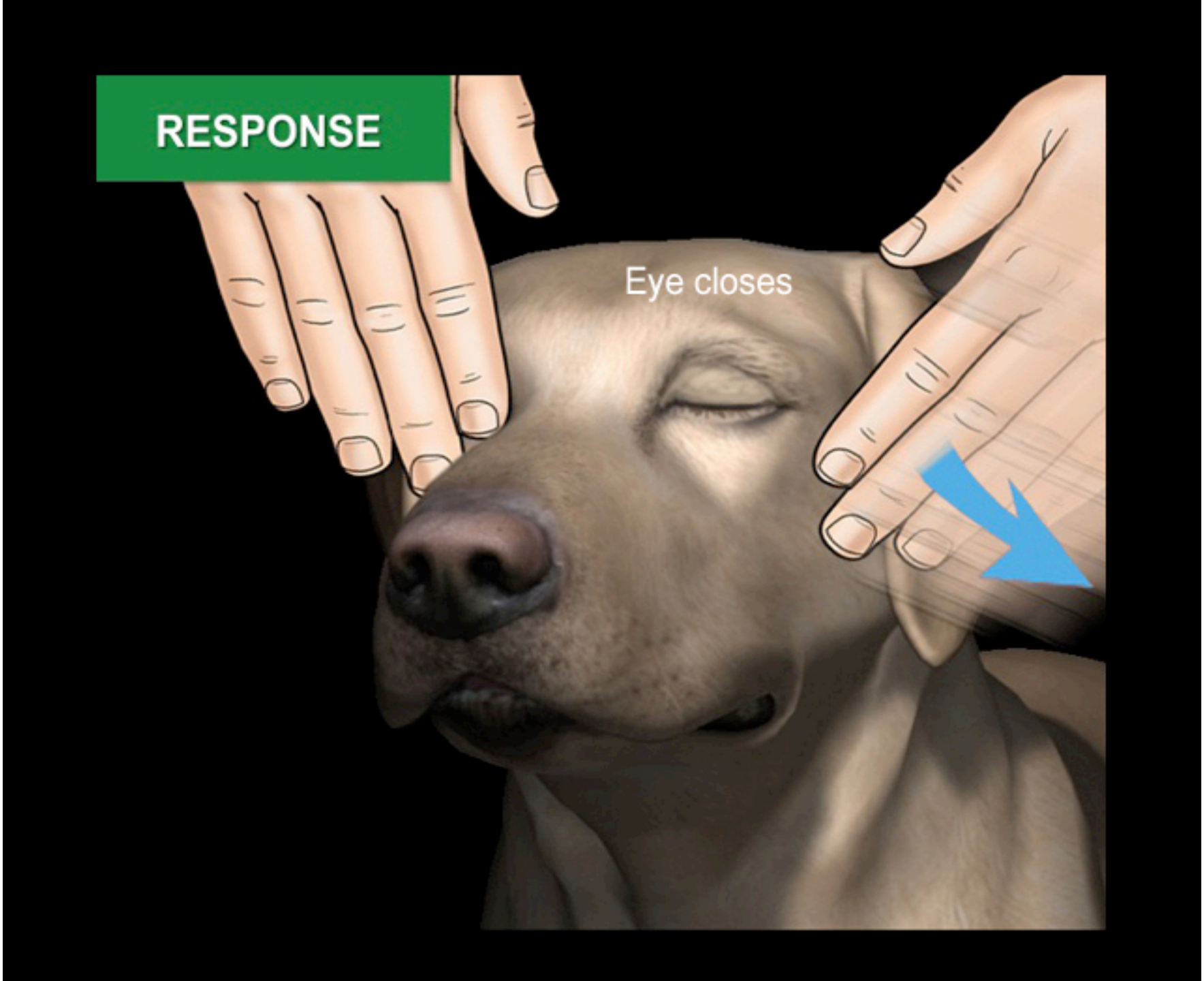
MOZAK konja

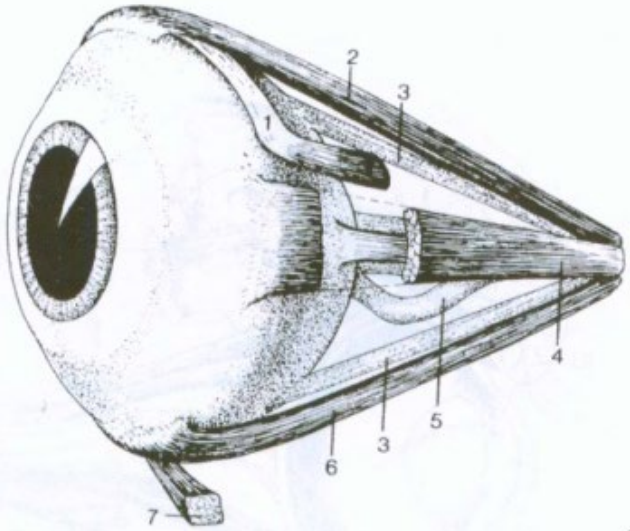
# NERVUS OPTICUS



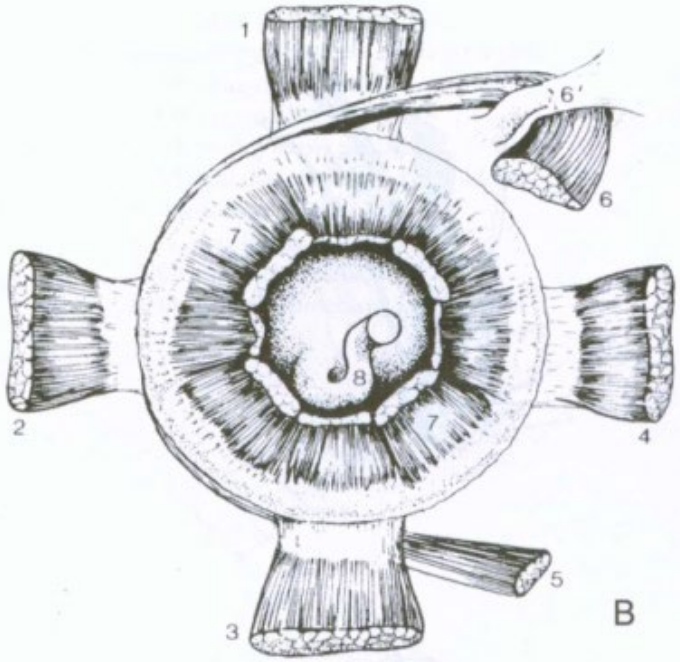
- Optic nerve
- Optic chiasma
- Optic tract
- Tuber cinereum
- Mamillary bodies
- Anterior perforated substance
- Olfactory trigone
- Pons
- Uncus




RESPONSE
Eye closes

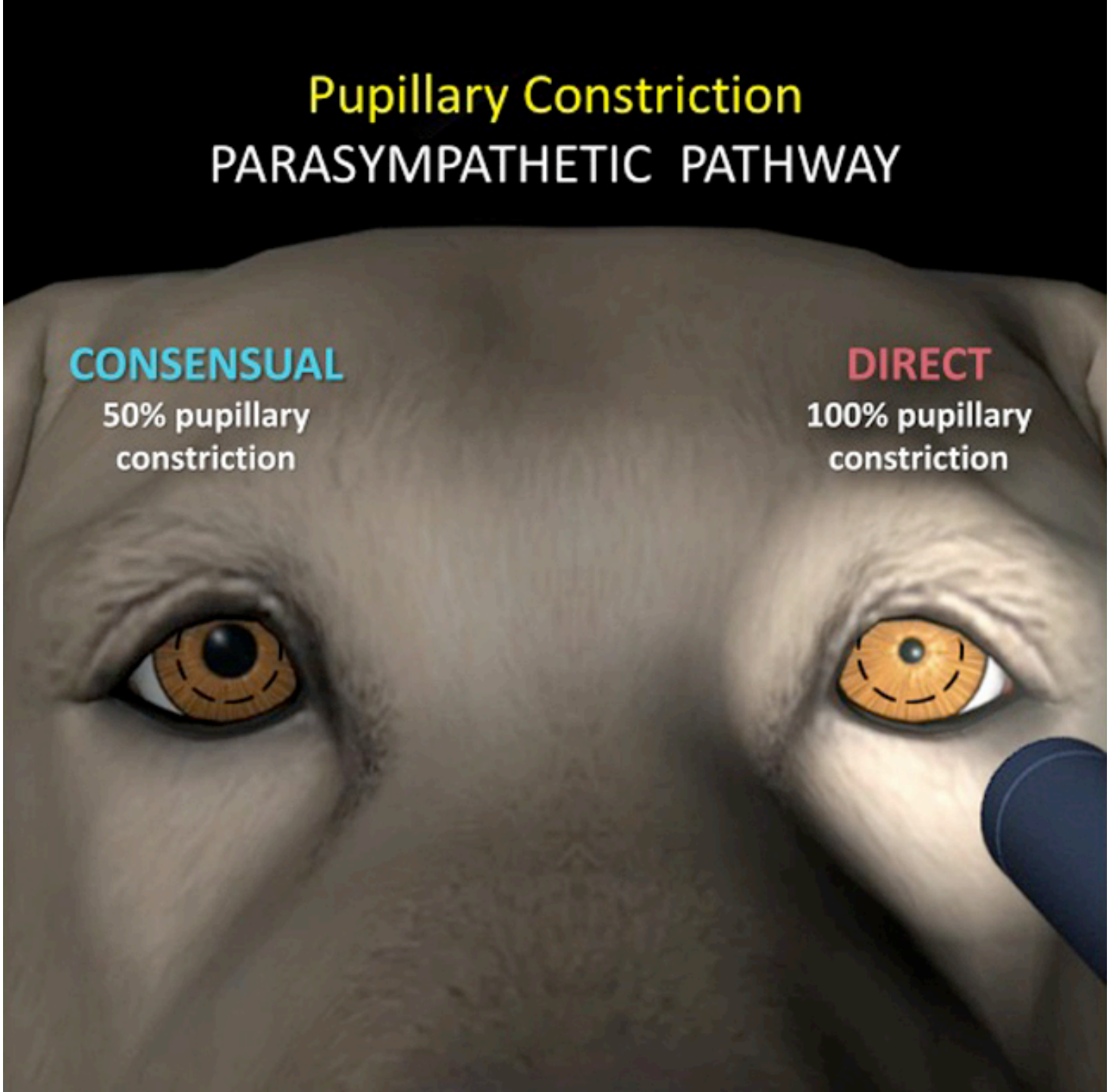


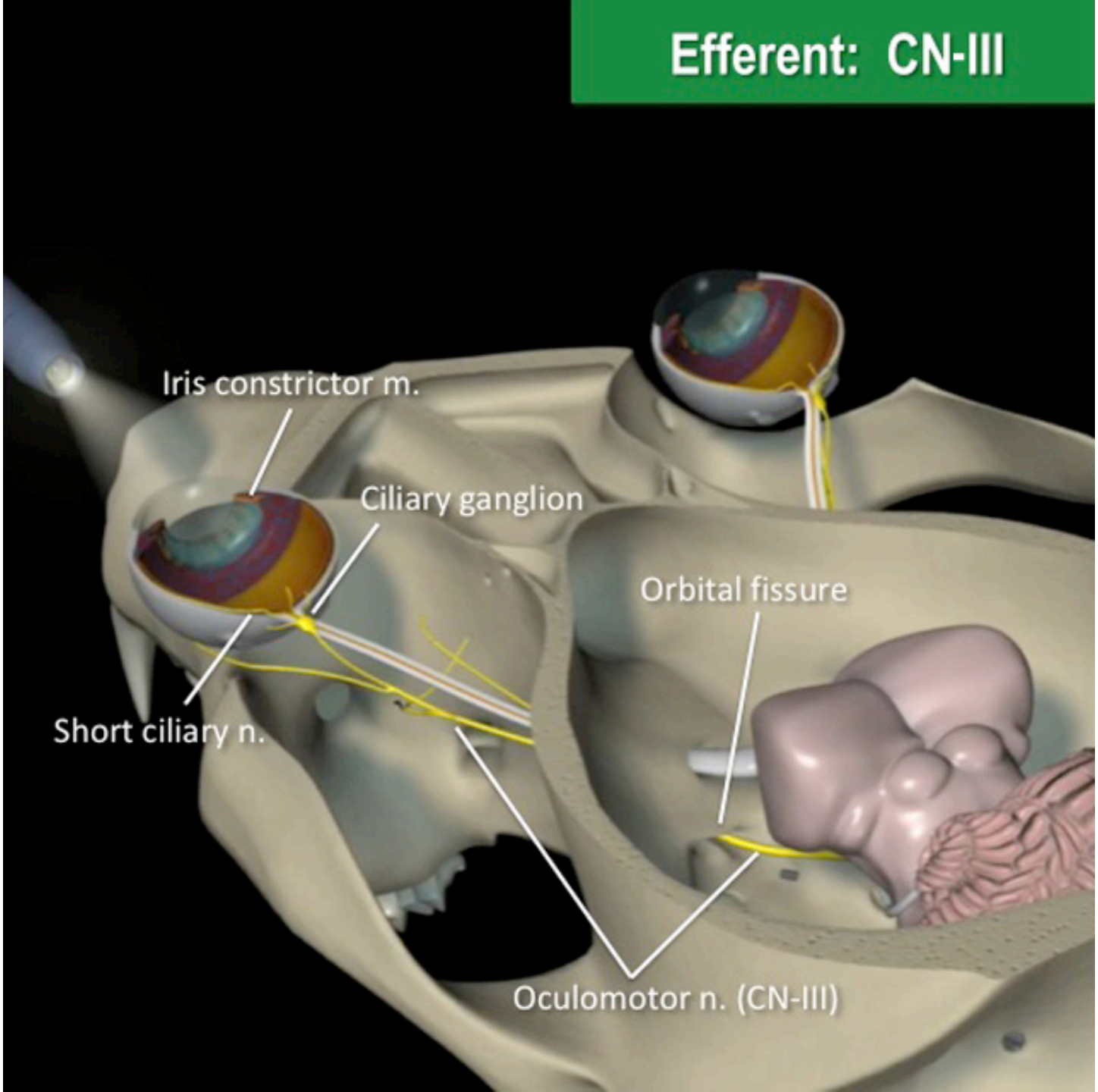

A



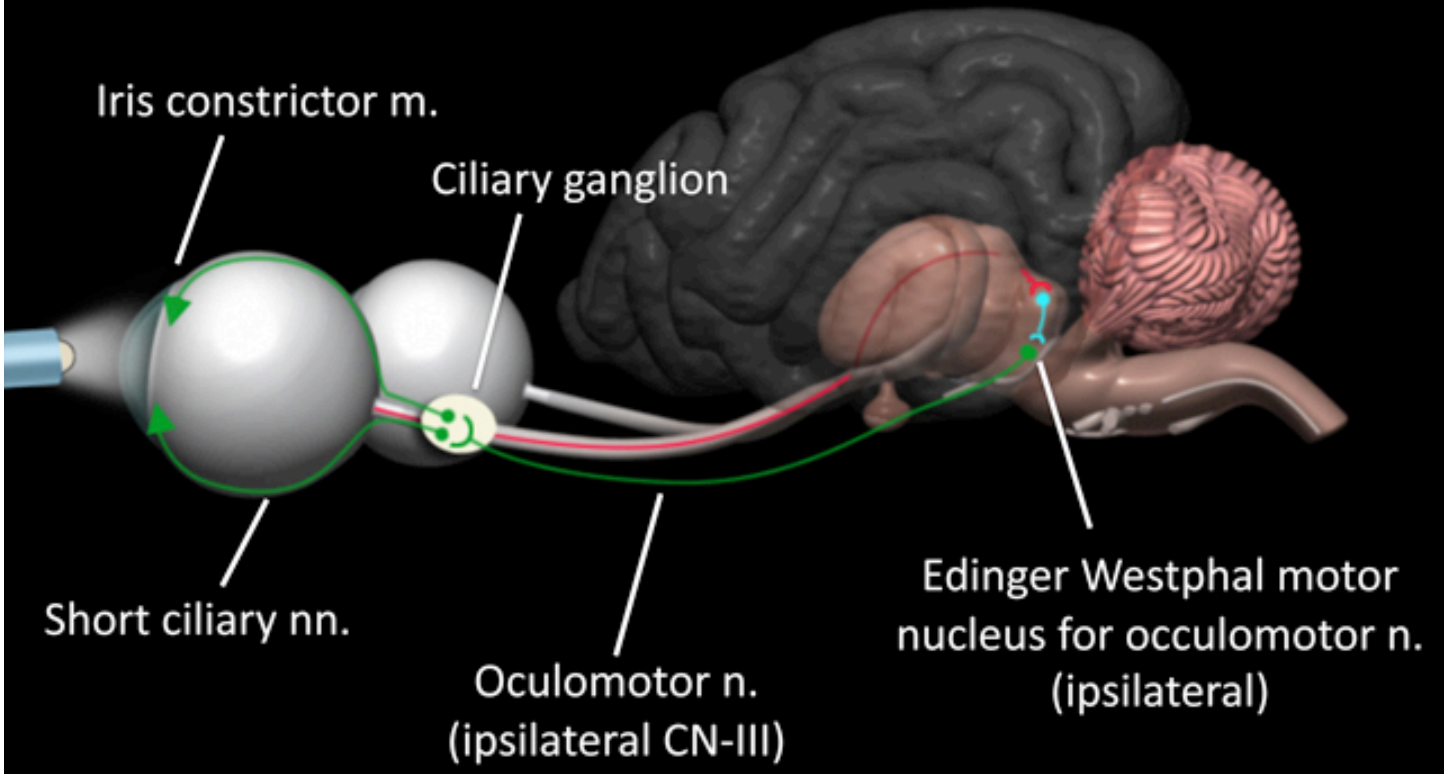

B

Slika 1058. **Musculi bulbi A; mišići leve očne jabučice; izgled sa kaudalne strane B**
**A-** 1. M. obliquus dorsalis, 2. M. rectus dorsalis, 3. M. retractor bulbi, 4. M. rectus medialis, 5. Nervus opticus, 6. M. rectus ventralis, 7. M. obliquus ventralis
**B-** 1. M. rectus dorsalis, 2. M. rectus lateralis, 3. M. rectus ventralis, 4. M. rectus medialis, 5. M. obliquus ventralis, 6. M. obliquus dorsalis, 6'. Trochlea, 7. M. retactor bulbi, 8. Nervus opticus


Pupillary Constriction
PARASYMPATHETIC PATHWAY
CONSENSUAL
50% pupillary constriction
DIRECT
100% pupillary constriction


Efferent: CN-III
Iris constrictor m.
Ciliary ganglion
Orbital fissure
Short ciliary n.
Oculomotor n. (CN-III)

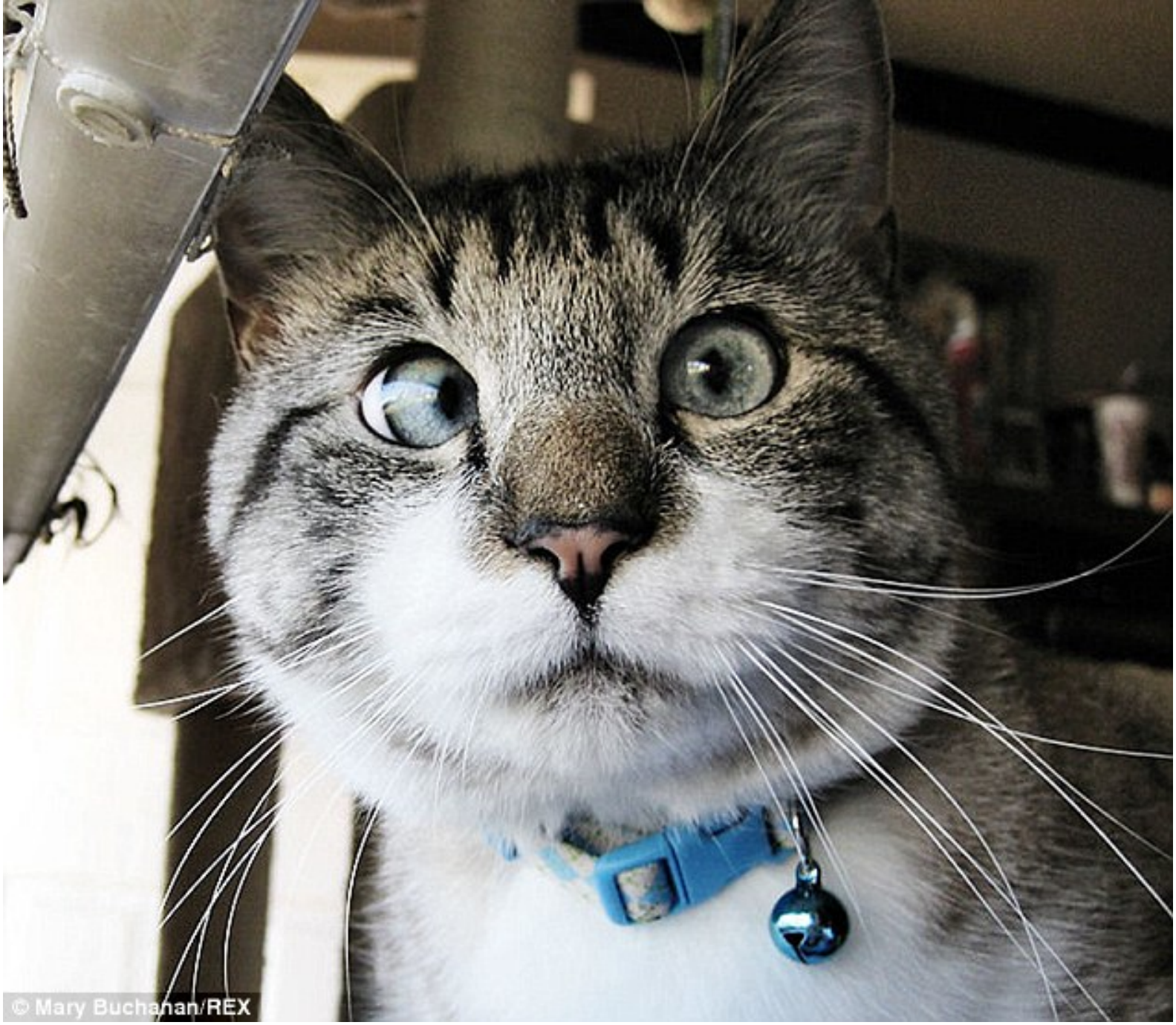
# PARASYMPATHETIC DIRECT PATHWAY




Afferent: CN-II | Interneuron | Efferent: CN-III

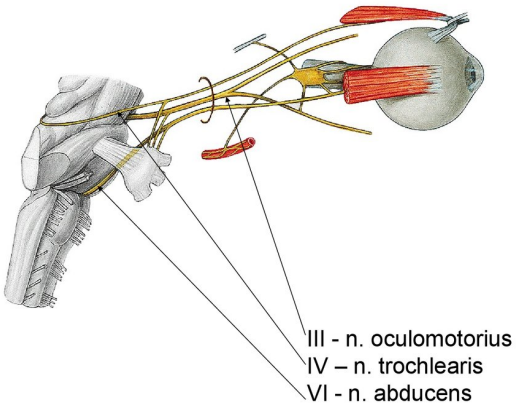
# Neuro Exam

- Brainstem lesion, CN 3, 4, 6
- Subtle changes seen by shining a bright light, reflection is normally symmetrical

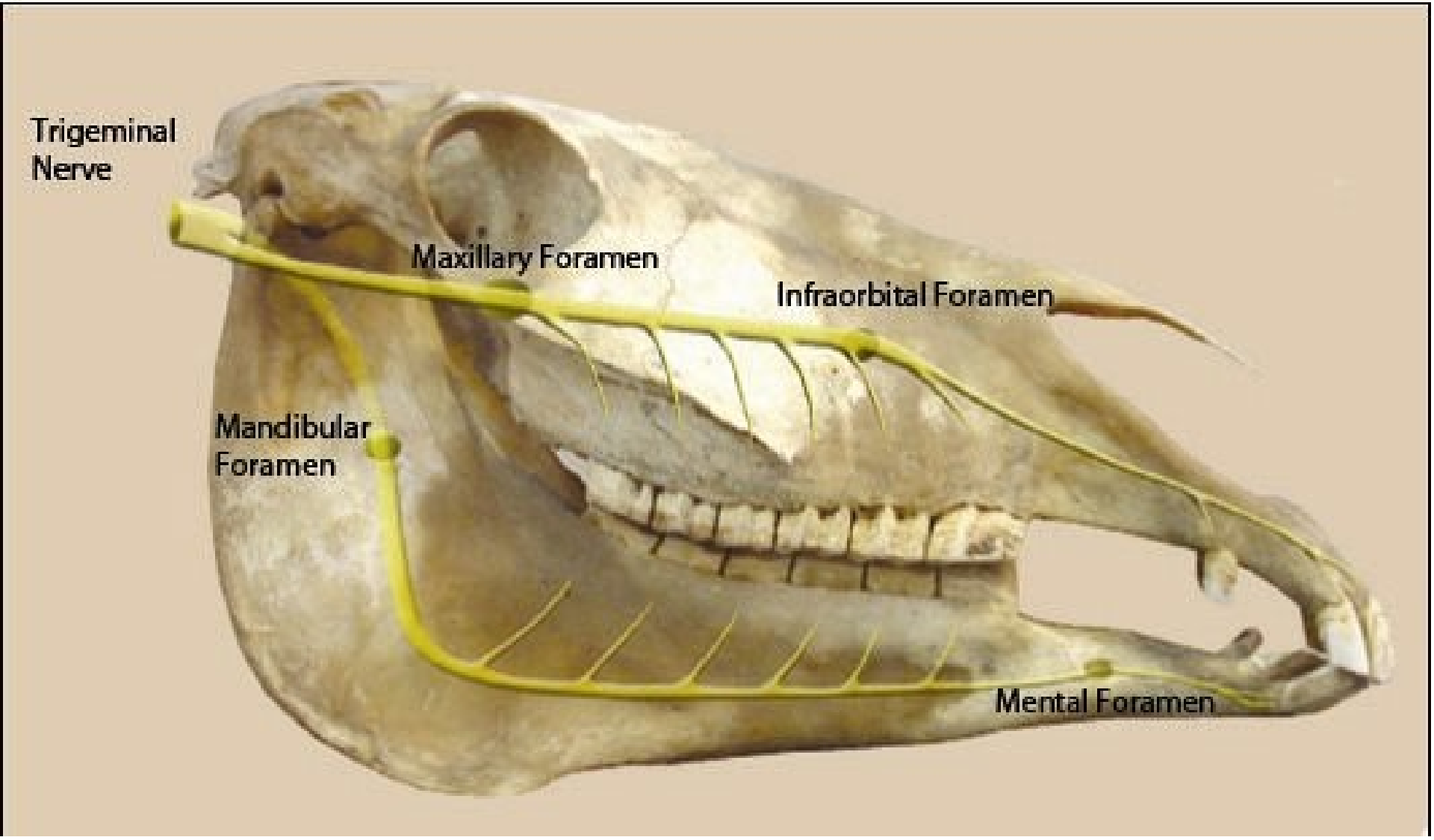

© Mary Buchanan/REX

# *IV- N. Trochlearis-nerv obrtač očne jabučice*

- Izlazi na dorzalnoj strani **moždanog stabla**
- Izlazi kroz ***foramen trochleare, Fissura orbitalis(EQ), Foramen orbitorotundum(RU)***
- Inerviše dorzalni kosi mišić-**N dorsalis**
- Po funkciji **je :MOTORNI NE**



# MAP OF THE 3 BRANCHES OF THE TRIGEMINAL NERVE


Trigeminal Nerve
Maxillary Foramen
Infraorbital Foramen
Mandibular Foramen
Mental Foramen

# *V-N.trigeminus*

- **Najjači moždani nerv**
- On je mešoviti nerv
- Izlazi sa **lateralne strane ponsa** sa dva korena:

1. Jačim -senzibilnim
2. Slabijim –motornim

- 1**. Veliki senzibilni koren(*radix major*)**- izlazi lateralno **iz ponsa**
- Ovaj ganglion prima simpatčika vlakna
- 2**. Mali motorni koren(*radix minor*)** izlazi iz ***ponsa*** lateralno

# *V-N.trigeminus*

- Ovaj nerv ima svoje tri najjače grane:

1. ***N. ophtalmicus***
2. ***N. maxillaris***
3. ***N. mandibularis***

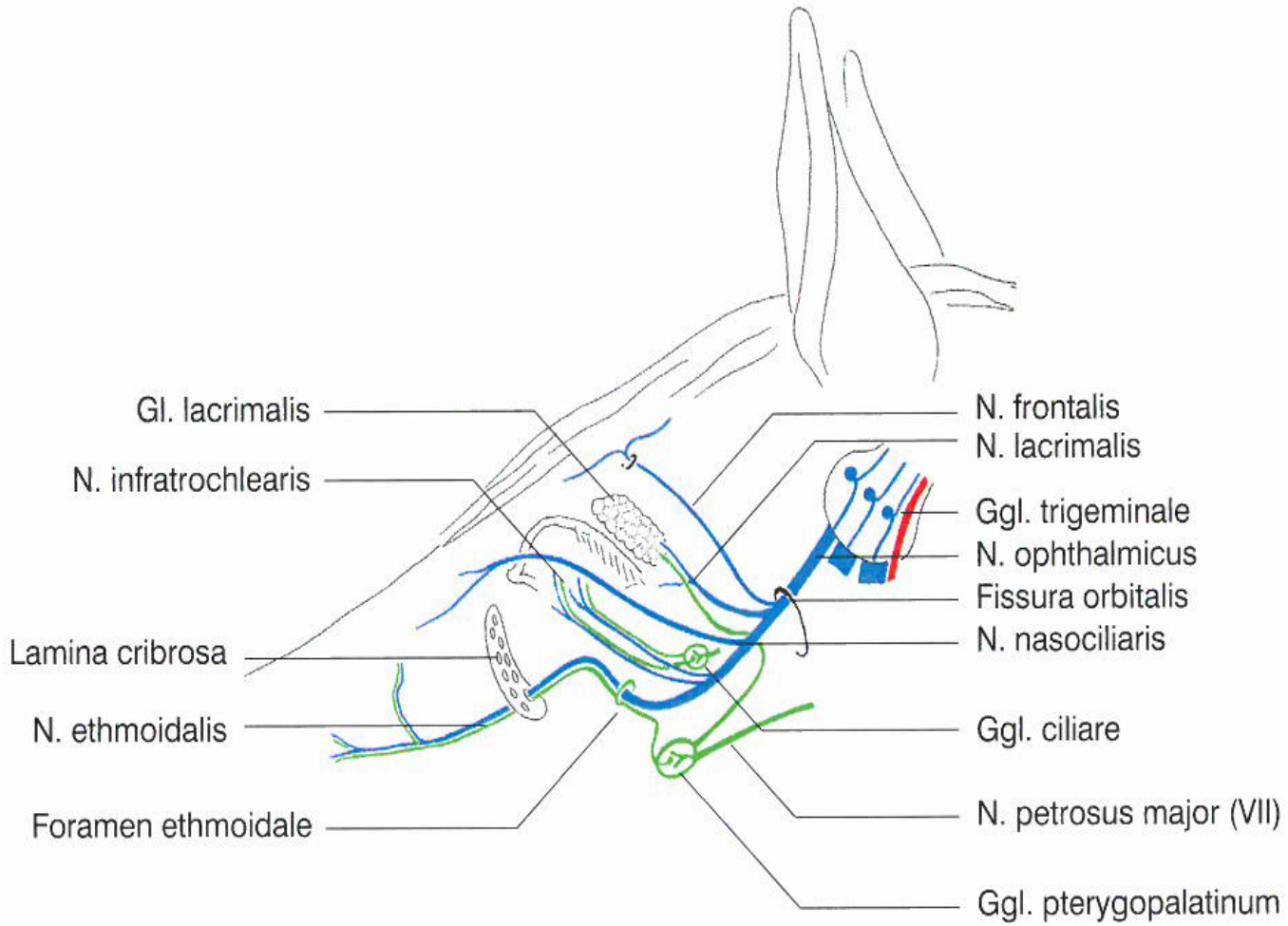
# *N-ophtalmicus*

- Njegove grane su sledeće:

1. ***N. Lacrimalis*-Grane za konjunktivu,tarzalnu žlezdu**
2. ***N.frontalis*-koža čela, gornji očni kapak,sluznica čeonog sinusa**
3. ***N nasociliaris-***

**-N. Infratrochlearis-**

# N-ophtalmicus



# *N- Maxillaris*

- **Senzibilna jača grana**
- Izlazi kroz ***F. Rotundum (EQ),F.orbitorotundum(RU;SU)***
- Ima svoje najznačajnije grane:

1. ***N.zygomaticus*-konjunktiva donjeg očnog kapka,koža slepoočnog dela**
2. ***N.pterygopalatinum***

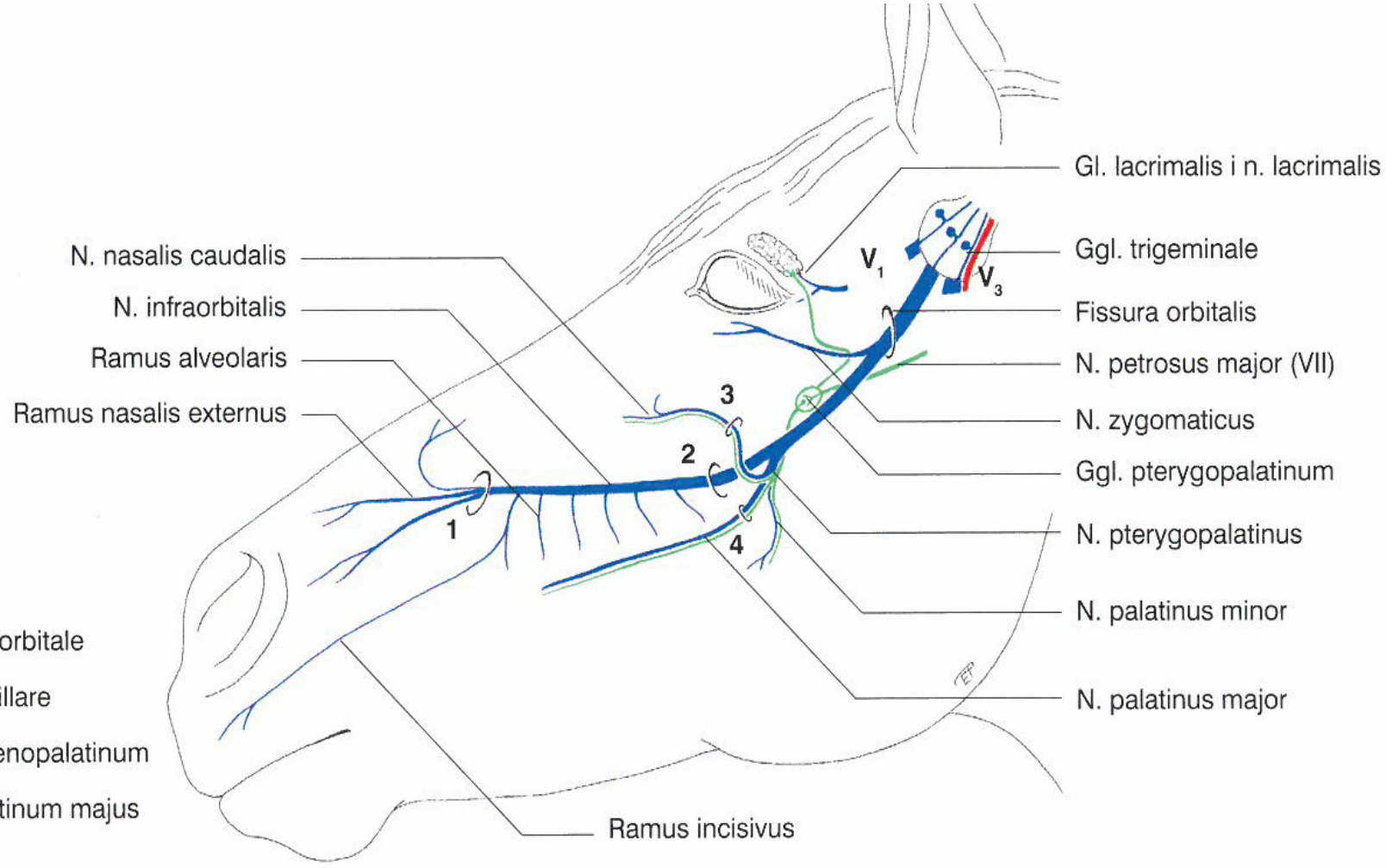
***a)n. Nasalis caudalis***

**b) *n.palatinus major-***

***c)n. palatinus minor-***

3. ***N.infraorbitalis*-*rami dentales,rami gingivales,rami nasales interni et externi,rami labiales superioris***

# N- Maxillaris




1 = Foramen infraorbitale

2 = Foramen maxillare

3 = Foramen sphenopalatinum

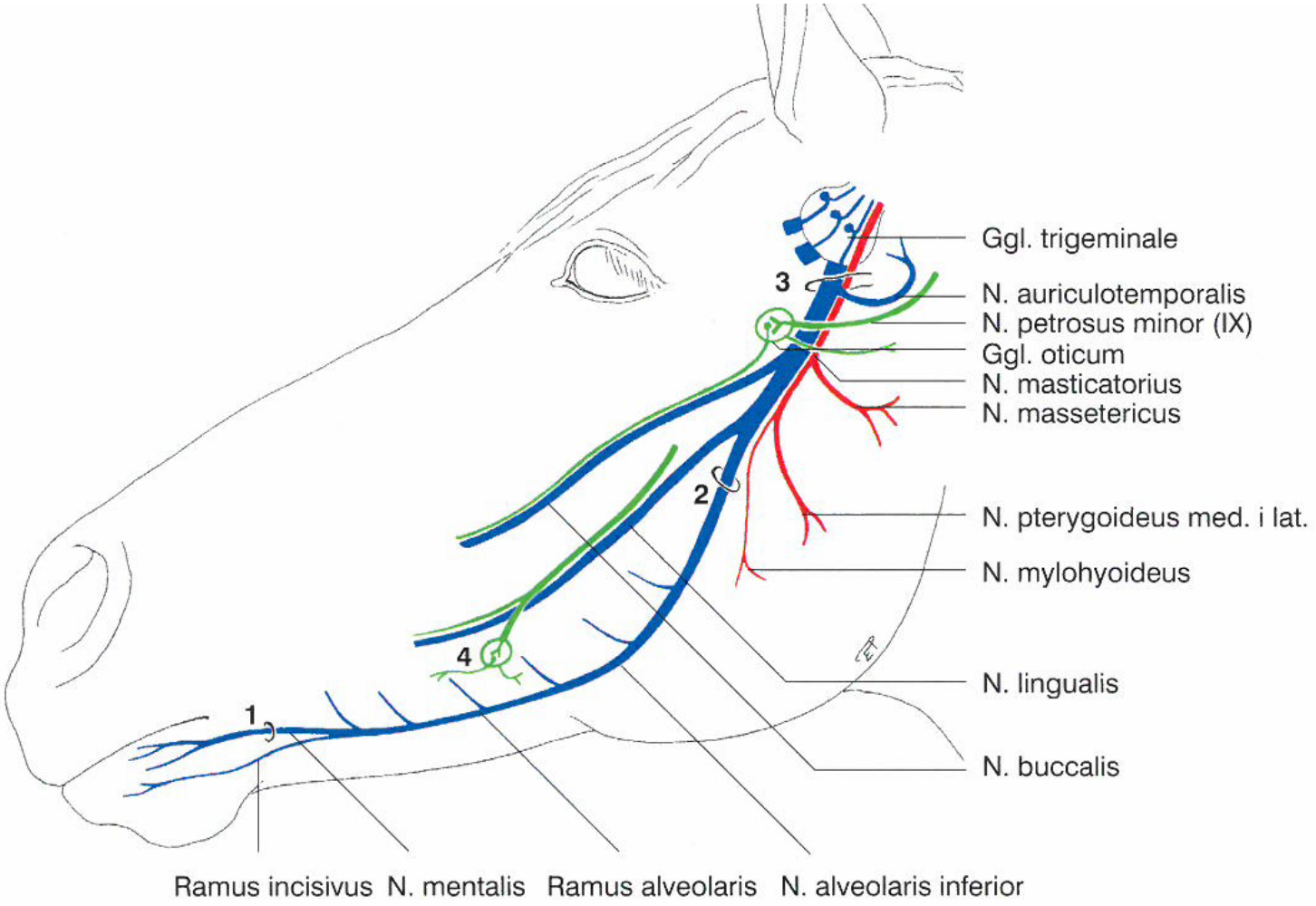
4 = Foramen palatinum majus

# *N-mandibularis*

- **Najjača grana trigeminalnog nerva**
- Mešovit po funkciji
- Ima 6 svojih grana:

1. ***N.masticatorius(M.masseter, M.temporalis)***
2. ***N. buccinatorius*-motorno-senibilno –sekretoran**
3. ***N.pterygoideus-M.pterygoideus***
4. ***N.auriculotemporalis***
5. ***N.lingualis(Ramus superficialis, Ramus profundus)***
6. ***N.alveolaris inferior***

# N-mandibularis




1 = Foramen mentale

2 = Foramen mandibulae

3 = Foramen lacerum,
Incisura ovalis

4 = Ggl. mandibulare

# *VI-N. abducens*

- Nerv **odmicač očne jabučice**
- **Motorni nerv** po funkciji
- Počinje jedrom u **dnu 4 moždane komore**
- Izlazi kroz ***fissura orbitalis konja, i Foramen orbitorotundum(ru,su)***
- **Inerviše M.rectus lateralis i  M. Retractor bulbi**

# *VII- N.facialis seu intermediofacialis*

- **Jeste mimični nerv ,koji pored motornih sadži senzorična,simpatička i parasimpatčka nervna vlakna**
- Motorno jedro se nalazi u tegmentumu ponsa
- Motoran je za mišiće lica ,nosa, očnih kapaka, usana
- Senzibilan za predeo spoljašnjeg uva
- Senzoričan za čulo ukusa
- Sekretoran za podjezičnu,podviličnu, suznu žlezdu
- On izlazi kroz **Foramen stylomastoideum**

- CLOSE YOUR EYES & MAKES YOU SMILE
- TASTE PIE &

MAKES YOU CRY

# *VII- N.facialis seu intermediofacialis*

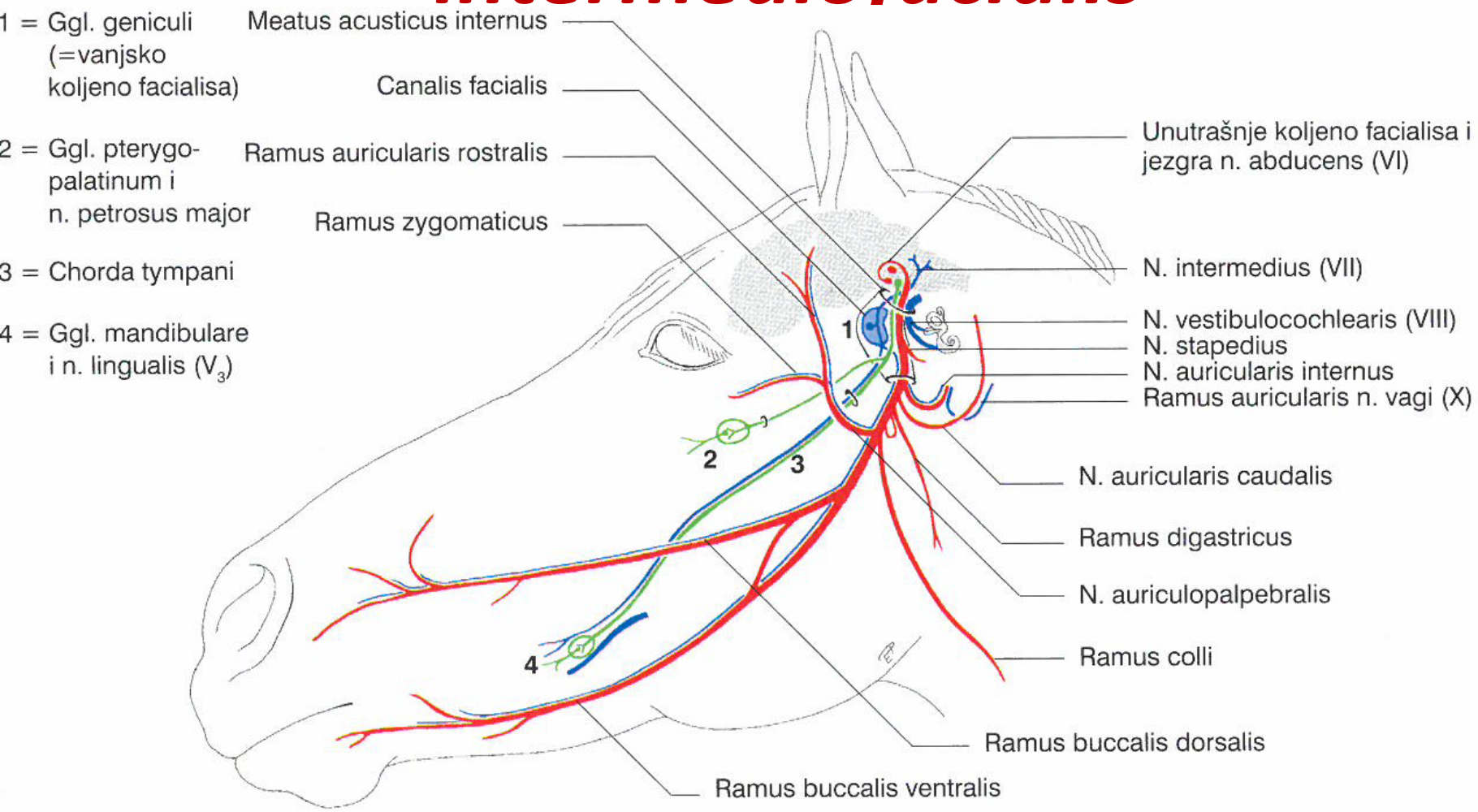
On poseduje sledeće grane u ***Canalis facialis*** slpoočne kosti:

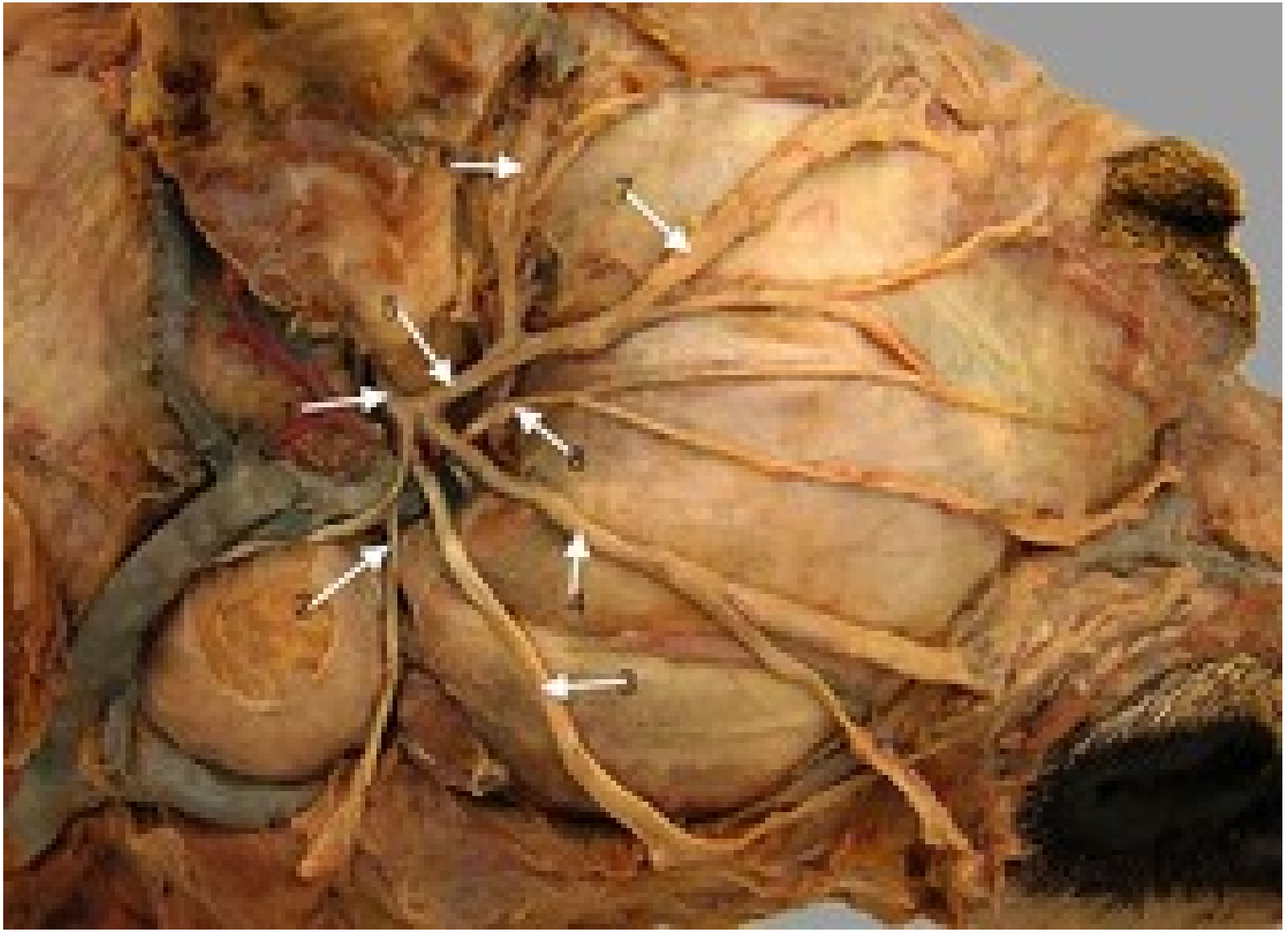
1. ***N.petrosus major*-samo parasimpatička vlakna.**
2. ***N.stapedius*-inerviše m.stapedius**
3. ***Chorda tympani-sa N.lingualis* daje vlakna za osećaj ukusa**
4. ***Ramus auricularis internus*-mišiće na bazi ušne školjke**

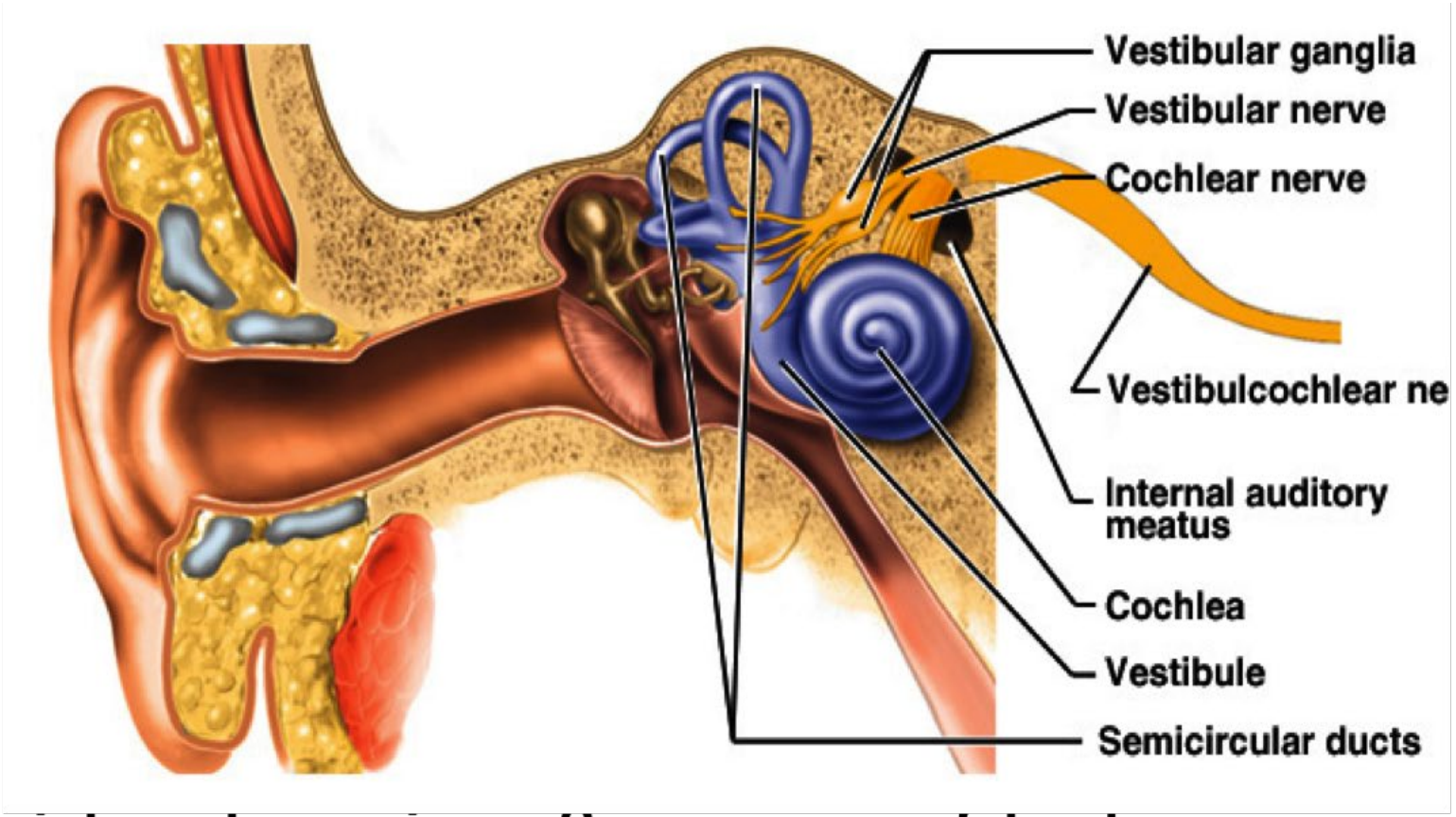
**Po napustanju foramen stylomastoideusa daje sledeće grane:**

1. ***N.auricularis caudalis-mišiće* ušne školjke**
2. ***Ramus digastricus-M.digastricus***
3. ***Plexus parotideus*-zaušnu žlezdu**
4. ***N.auriculopalpebralis*-za očne kapke, *M.orbicularis oculi***
5. ***Rami buccales*-mišići obraza,gornje usne nozdrva**
6. ***Rami colli*- vratni kutani mišić, *M masseter***

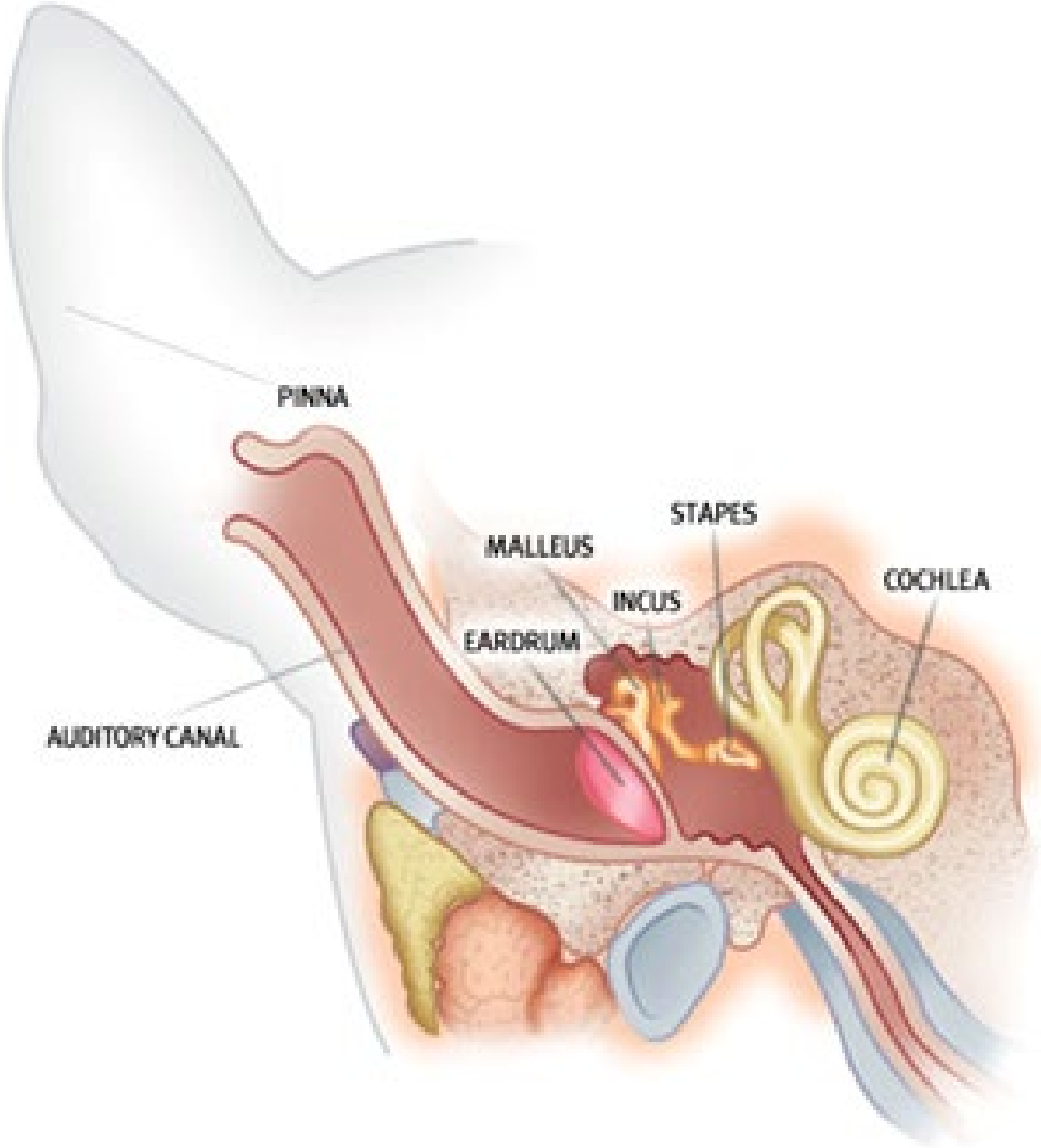
# VII- N.facialis seu intermediofacialis



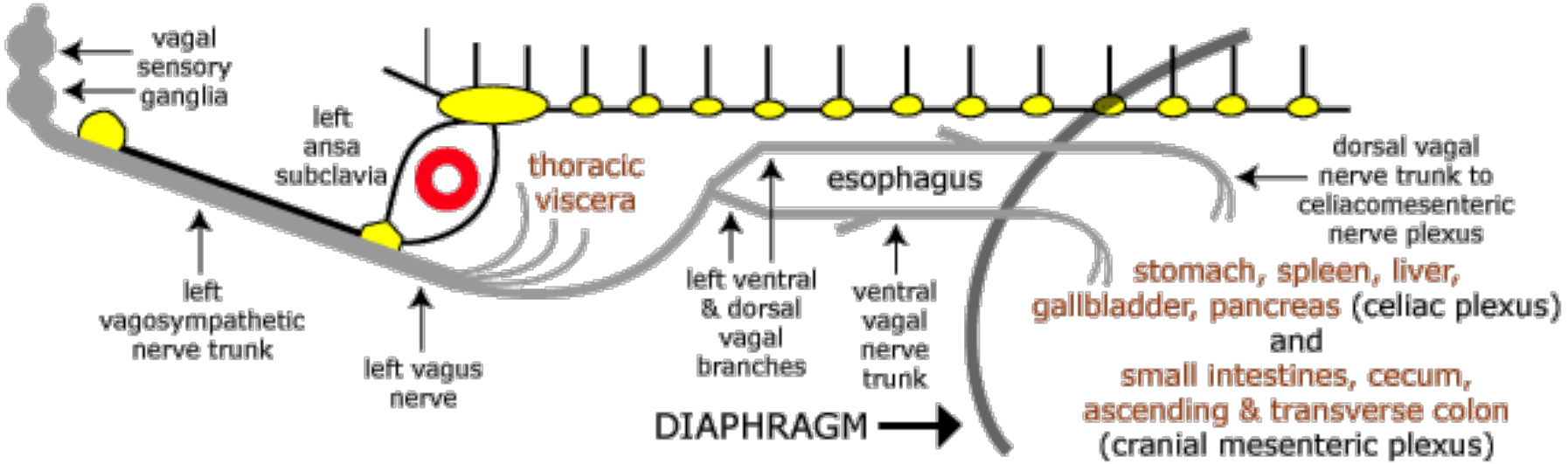





- Provides hearing & sense of balance
- Damage produces deafness, dizziness, nausea, loss of balance & nystagmus


PINNA
STAPES
MALLEUS
COCHLEA
INCUS
EARDRUM
AUDITORY CANAL

# Schematic of Parasympathetic VE Innervation to Thoracic & Abdominal Viscera




NOTE: Postganglionic neurons are in terminal ganglia located within submucosal & myenteirc nerve plexuses

Motorni nerv – miišići larynxa, konstriktori pharynxa

Senzitivni – koža unutrašnje površine uške, za moždanice, sluznica ždrela I početnog dela jednjaka

Senzorični – gustatorne papile na nepcu

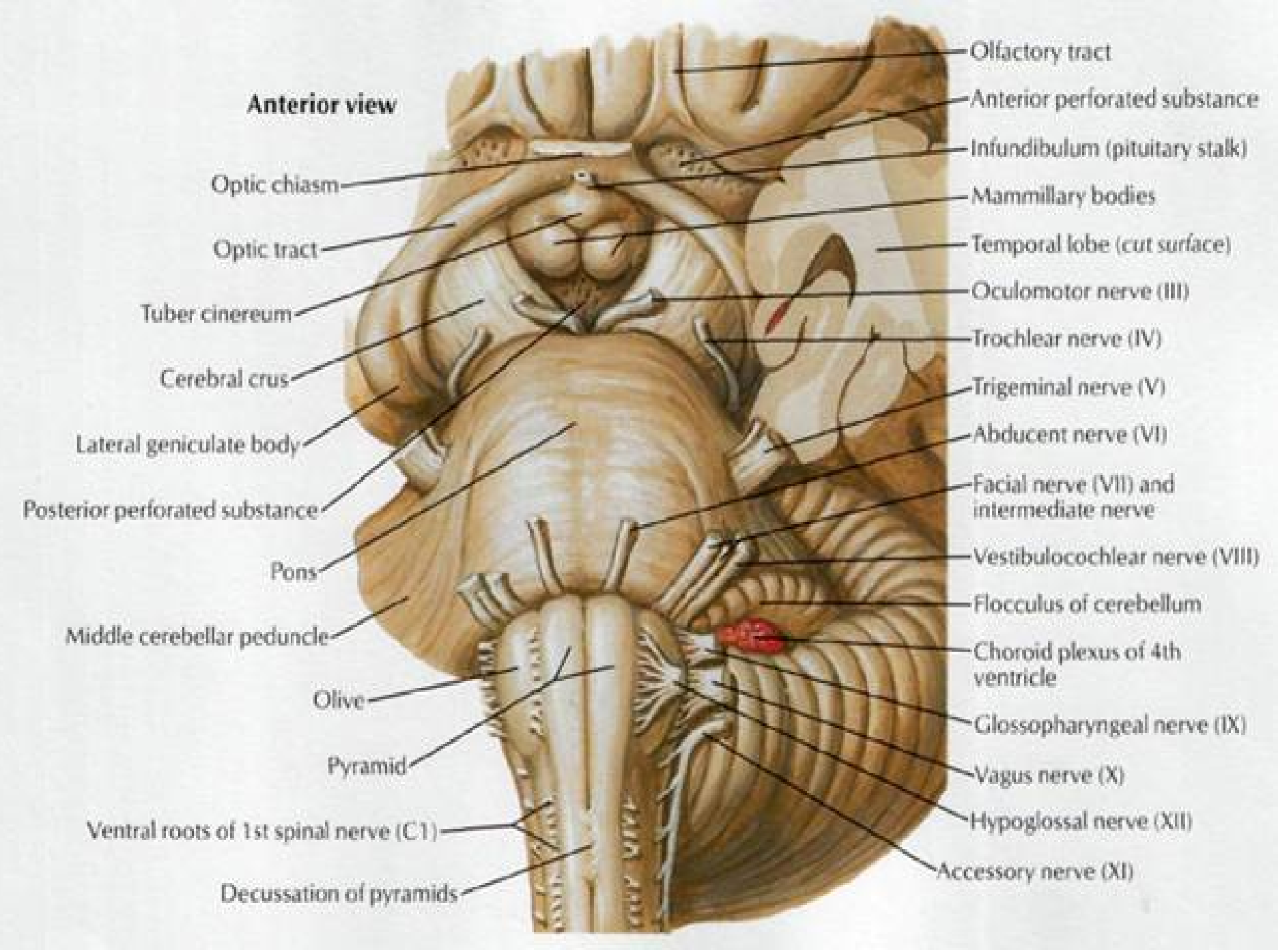
Parasimpatički – 75% parasimpatičkih vlakana nosi n. vagus

On ima u medulla oblongata sledeća jedra:

1)motorno jedro: Nc. ambiguus je motorno jedro zajedničko za IX, X i XI nerv.Kaudalni deo ovog jedra je motorno jedro n. vagusa.

2) senzitivno jedro: tu spadaju ganglion proximale i ganglion distale

3) parasimpatičko jedro je nucleus parasympaticus n.vagi , drugog naziva nc. dorsalis n.vagi


Anterior view
Olfactory tract
Anterior perforated substance
Infundibulum (pituitary stalk)
Optic chiasm
Mammillary bodies
Optic tract
Temporal lobe (cut surface)
Oculomotor nerve (III)
Tuber cinereum
Trochlear nerve (IV)
Cerebral crus
Trigeminal nerve (V)
Lateral geniculate body
Abducent nerve (VI)
Facial nerve (VII) and intermediate nerve
Posterior perforated substance
Pons
Vestibulocochlear nerve (VIII)
Flocculus of cerebellum
Middle cerebellar peduncle
Choroid plexus of 4th ventricle
Olive
Glossopharyngeal nerve (IX)
Pyramid
Vagus nerve (X)
Hypoglossal nerve (XII)
Ventral roots of 1st spinal nerve (C1)
Accessory nerve (XI)
Decussation of pyramids

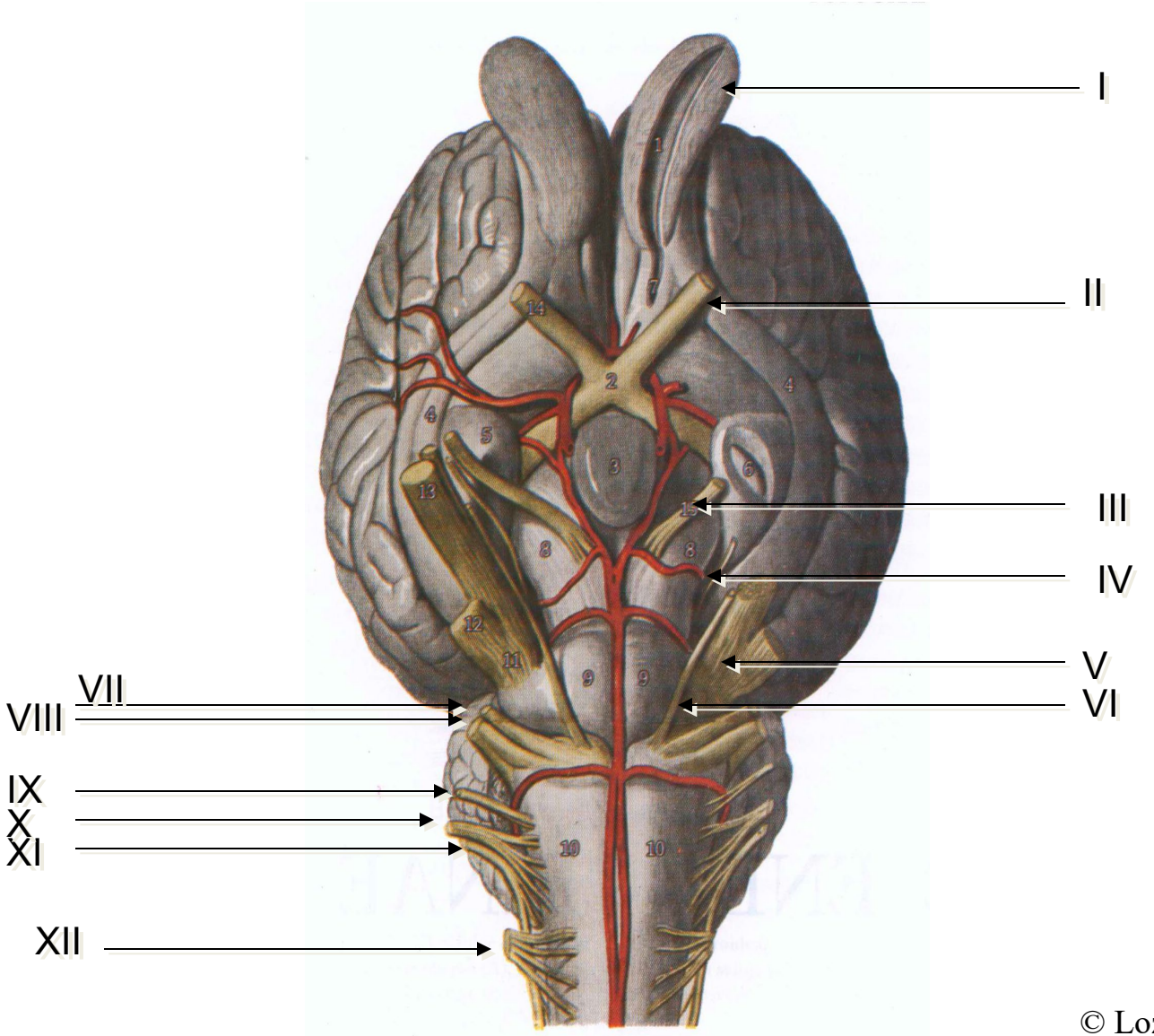
# *XI- N accessorius*

- **Motorni nerv**
- Motorno jedro u prouženoj moždini
- Izlazi kroz ***F.lacerum (eq,su) , F.jugulare(bo,car***)
- Inerviše sledeće mišiće: ***M.trapezius,M.rhomboideus, M.brachiocephalicus, M. sternocephalicus***
- Daje motorne grane i ***N.vagusu***

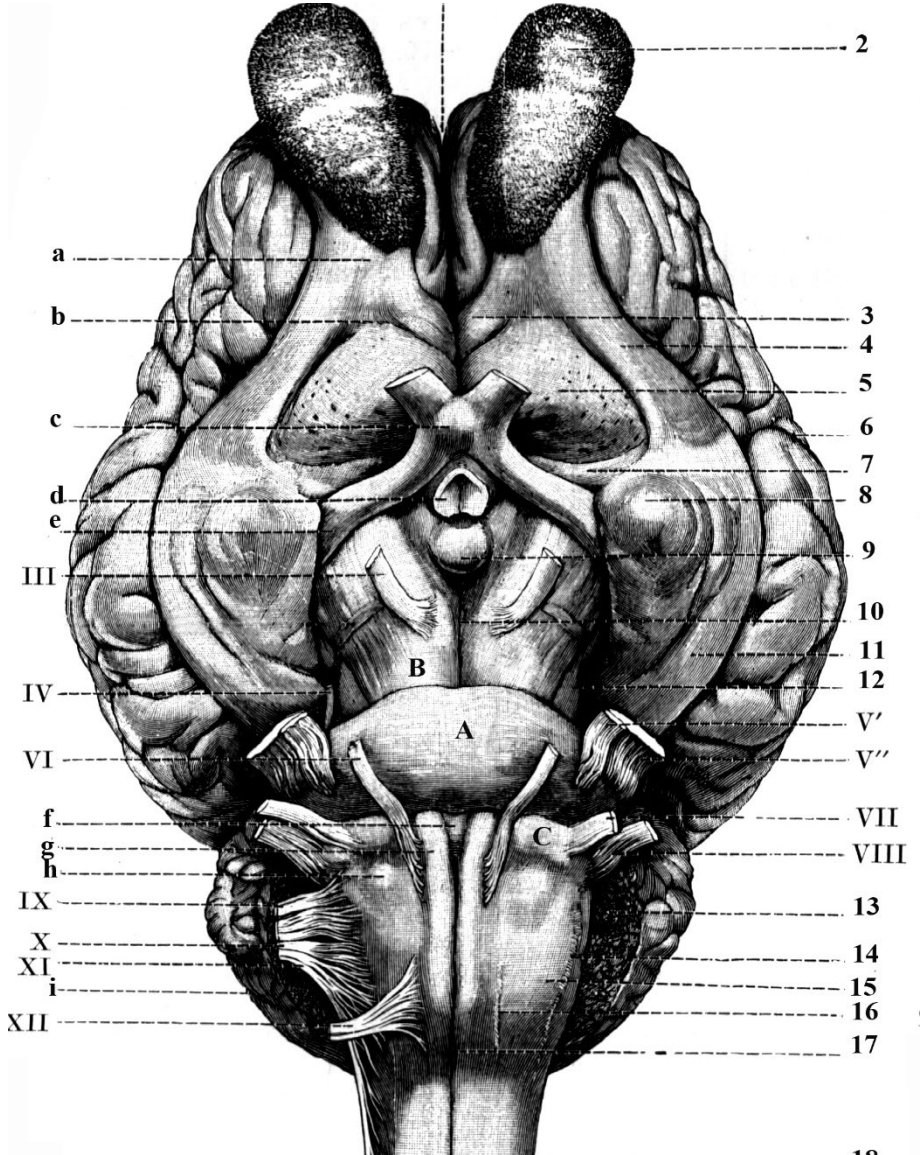
# *XII- N.hypoglossus*

- **Motorni nerv mišića jezika**
- **Ima dva motorna jedra : jedno u kičmenoj moždini, jedno u produženoj moždini**
- **Izlazi kroz *Foramen n.hypoglossi***
- Inerviše mišiće jezika i jezične kosti-***Rami linguales***

*BAZA MOZGA* *(mesto izlaza nerava)*



# *BAZA MOZGA* *(mesto izlaza nerava)*




I- *Bulbus olfactorius*

II- *Shiasma opticum*

III - *Mesencephalon*

IV- *Mesencephalon*
(jedini sa dorzalne strane)

V- *Pons*

VI- XII - *Medulla oblongata*