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CENTRALNI NERVNI SISTEM

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An anatomical illustration of the human spine and ribcage. The spine is shown in a light blue color, and the ribcage is also in light blue. The intervertebral space, which is the area between the vertebrae, is highlighted in a bright red color. The text "Međumozak i treća moždana komora" is overlaid on the image in white, bold font.

Međumozak i treća moždana komora



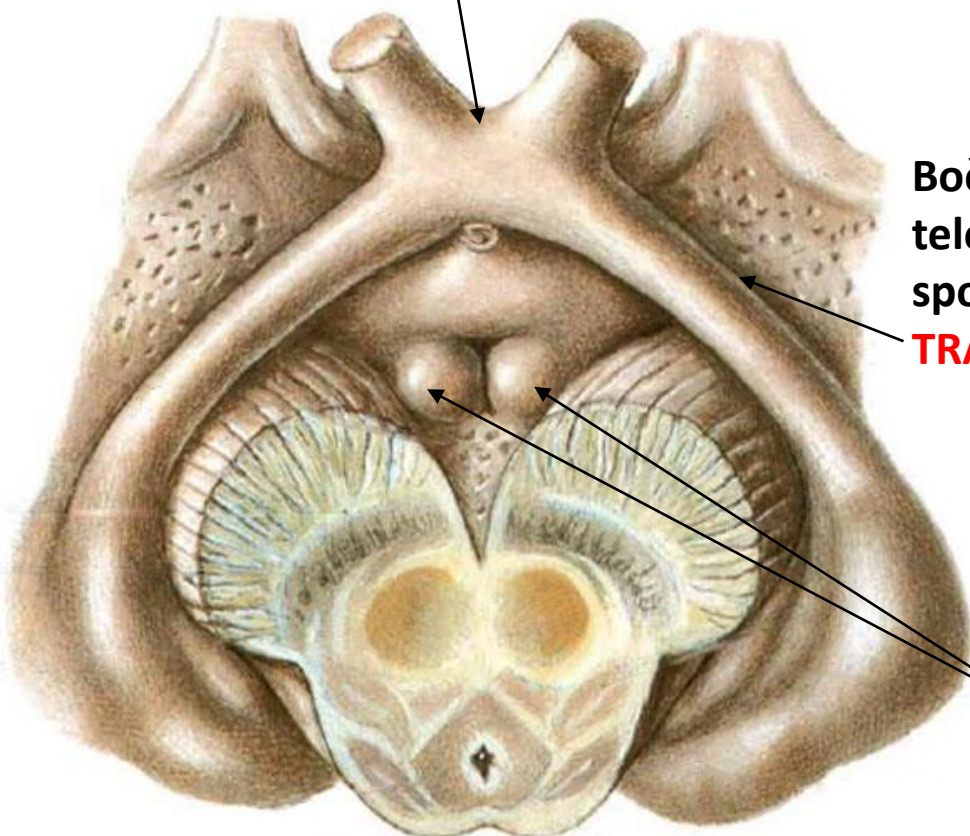
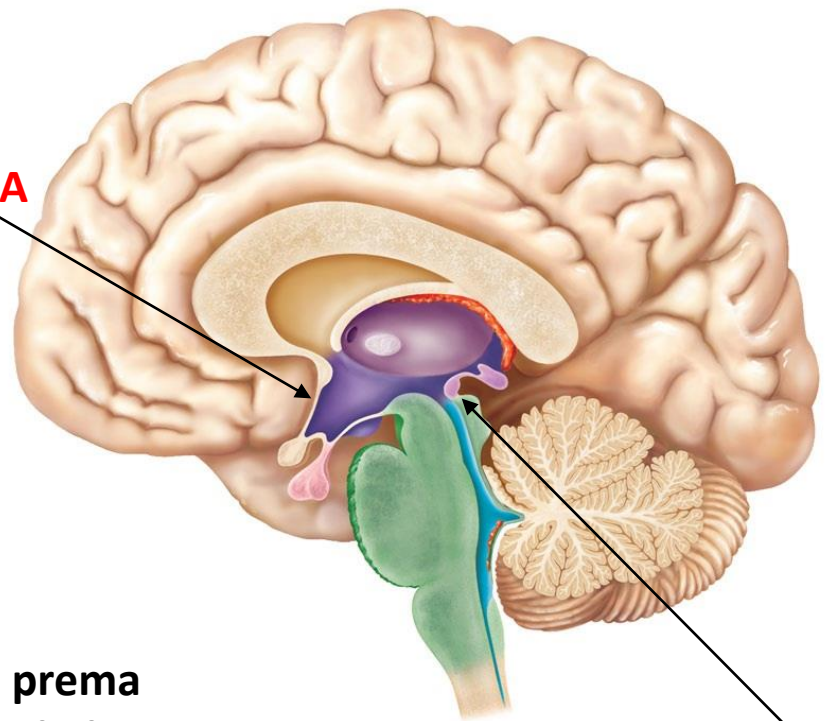
DIENCEPHALON - MEĐUMOZAK

- ✓ Nalazi se između leve i desne hemisfere velikog mozga, pokriven sa svih strana, osim sa donje, koja naleže na telo klinaste kosti
 - ✓ Ima 2 osnovna dela: - gornji-Talamus
- donji-Hipotalamus
- ✓ Centralna šupljina III moždana komora-izgled uzane pukotine

DIENCEPHALON – GRANICE

Duboka granica, prema telencephalonu – **LAMINA TERMINALIS**

Rostralno, prema telencephalonu – prednja ivica **CHIASMA OPTICUM**



Bočno, prema telencephalonu – spoljašnja ivica **TRACTUS OPTICUS**

Na dorzalnoj strani prema mesencephalonu – prednja ivica **LAMINAE QUADRIGEMINAE**

Kaudalno, prema mesencephalonu – zadnja ivica **CORPORA MAMMILLARIA**

Granice su jasne samo na ventralnoj strani

DJELOVI DIENCEPHALONA

I) DORZALNI DIENCEPHALON:

1. Thalamus dorsalis
2. Metathalamus
3. Epithalamus

II) VENTRALNI DIENCEPHALON:

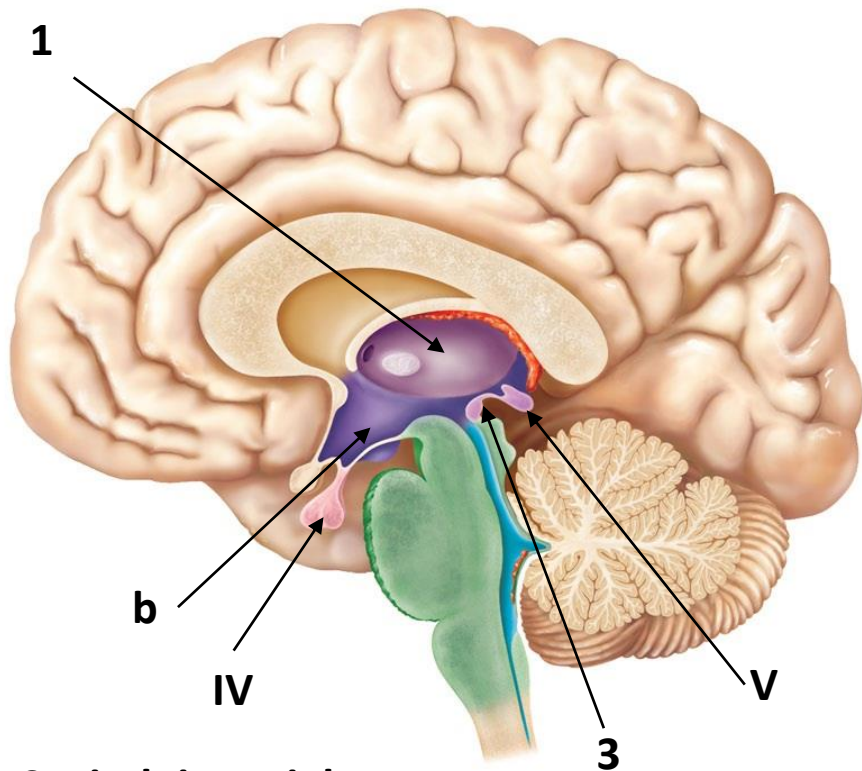
- a) Thalamus ventralis s. Subthalamus
- b) Hypothalamus

III) VENTRICULUS TERTIUS

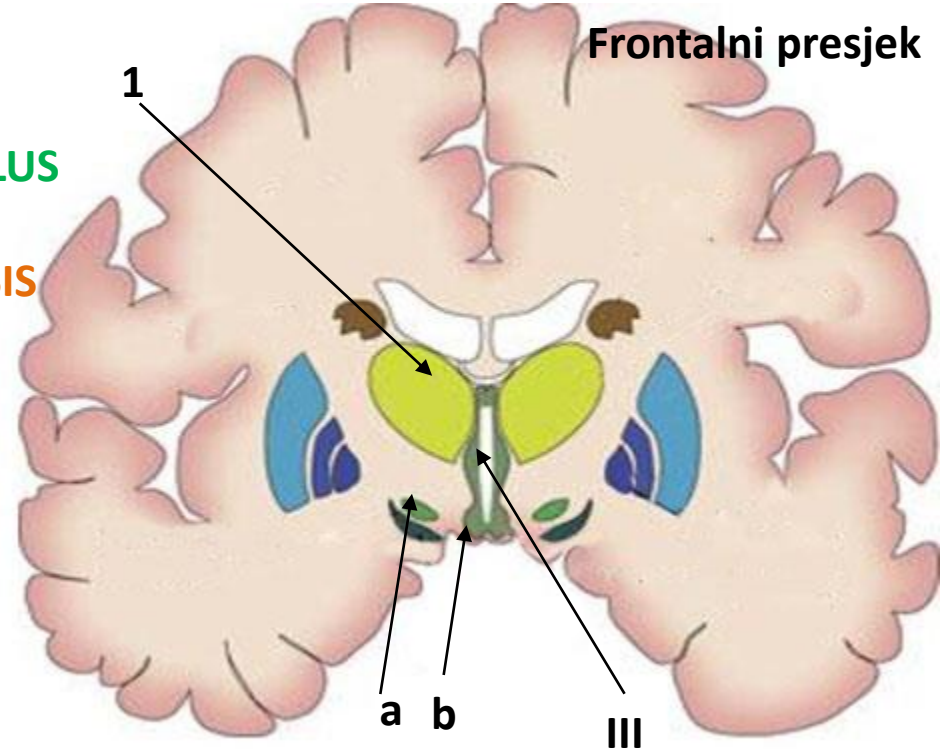
IV) HYPOPHYSIS

V) CORPUS PINEALE

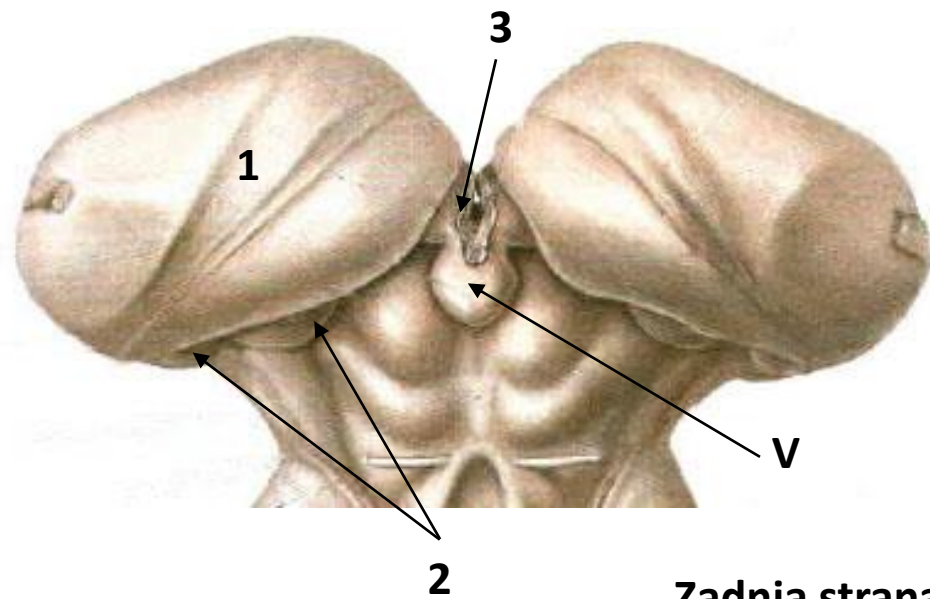
PINEALE



Sagitalni presjek



Frontalni presjek



Zadnja strana

A 3D anatomical illustration of a human skeleton. The spine is highlighted in a reddish-pink color, while the rest of the skeleton is rendered in a semi-transparent blue. The text 'MORPHOLOGIA EXTERNA' is overlaid in white, bold, sans-serif font across the center of the image.

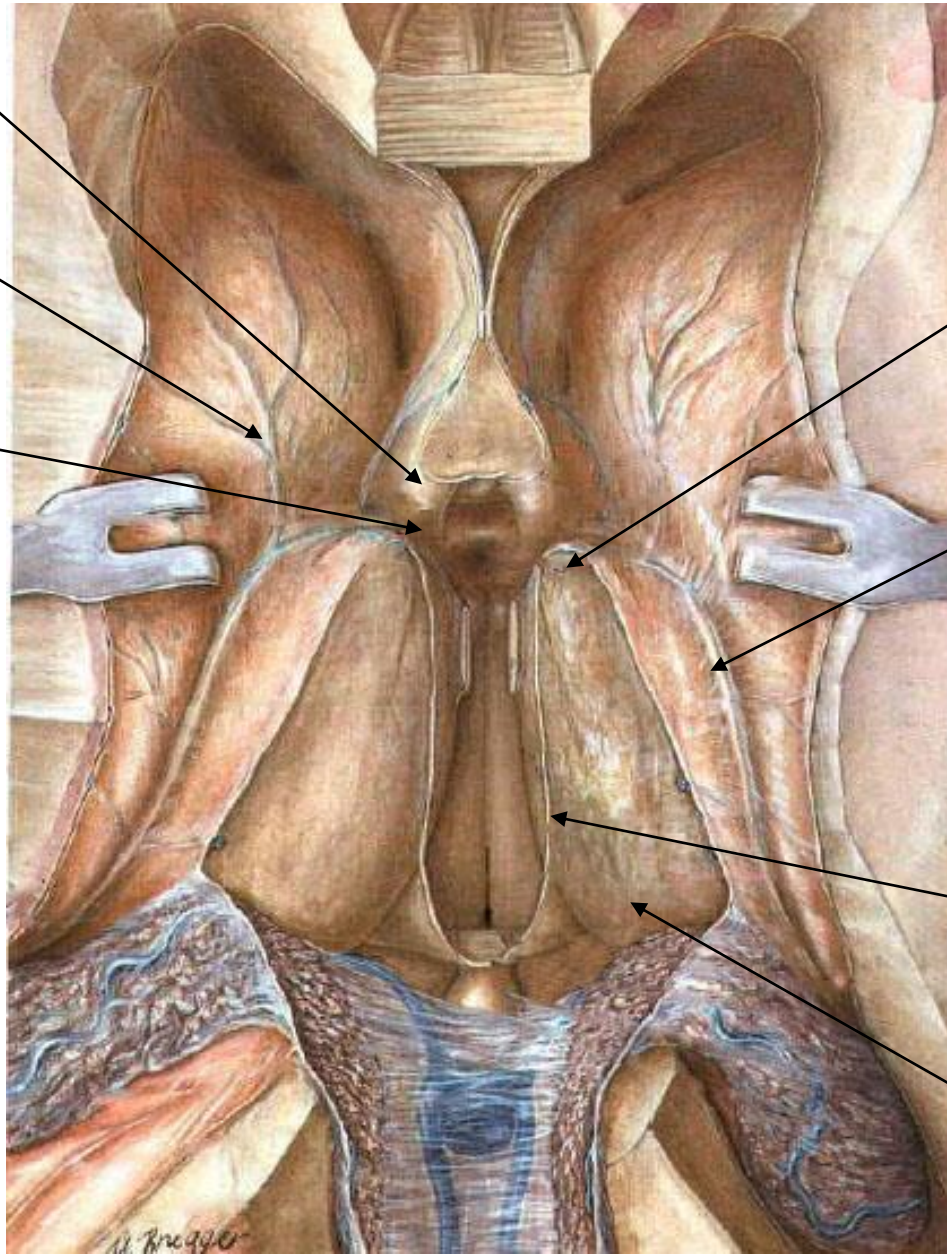
MORPHOLOGIA EXTERNA

THALAMUS ili Vidni brežuljak

Columna fornicis

Nc. caudatus

Foramen
interventriculare



Gornja strana

**TUBERCULUM
ANTERIUS THALAMI**

**Stria terminalis
(v. thalamostriata)**

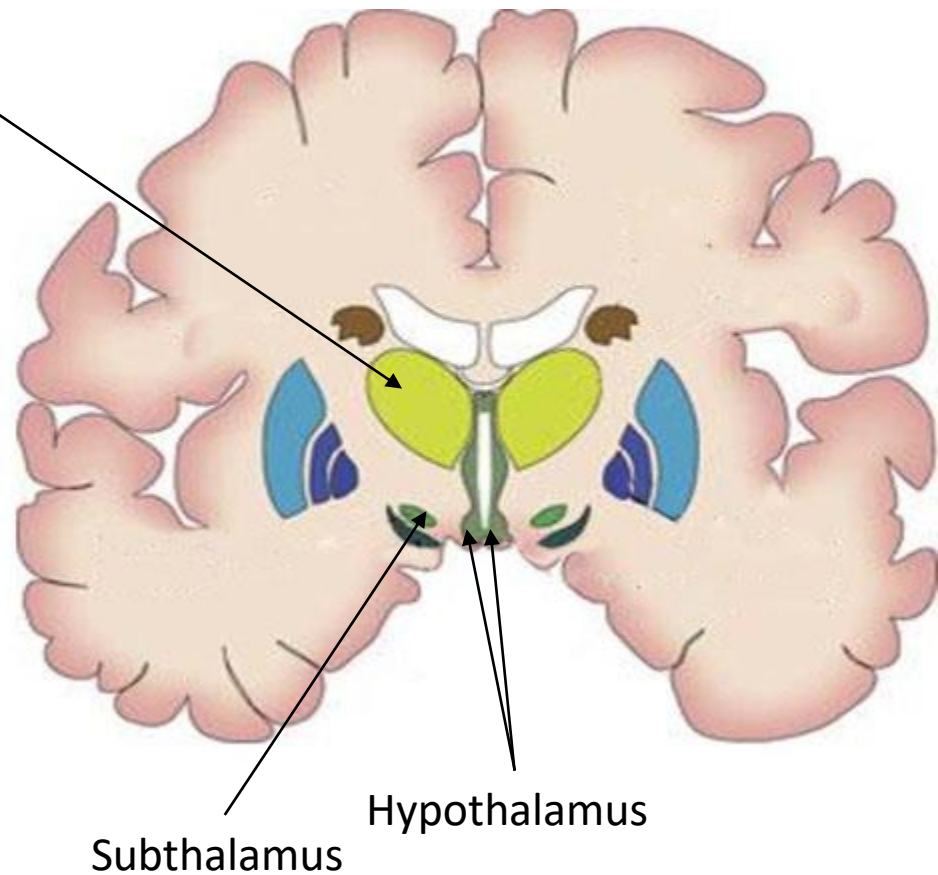
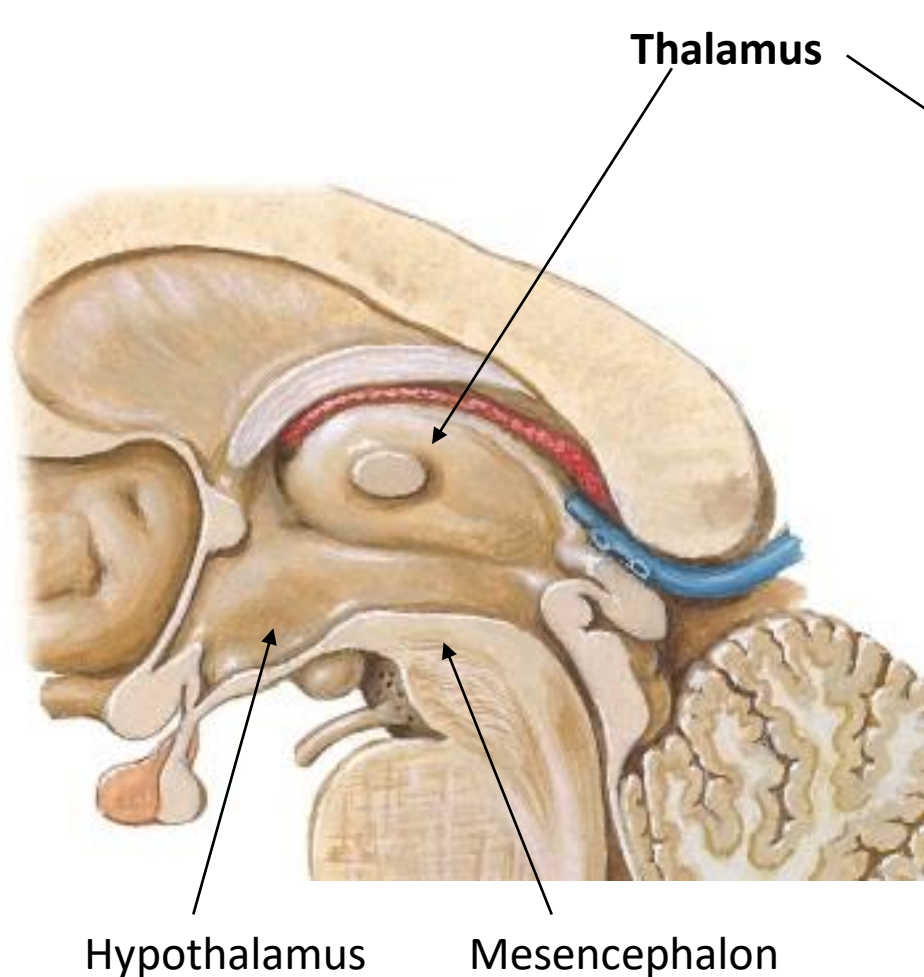
**Taenia thalami
(stria medullaris
thalami)**

PULVINAR THALAMI

- Oblika ovoida
- Izmedju 3.moždane komore i unutrašnje moždane čahure
- Gornjom stranom ulazi u sastav poda bočne moždane komore, a donjom srastao sa hipotalamusom
- Zadnjem,zadebljalom delu pridodata su dva manja dela medjumozga, Metathalamus – corpus geniculatum laterale i mediale; Epithalamus-habenulae, commissura habenularum i corpus pineale

THALAMUS

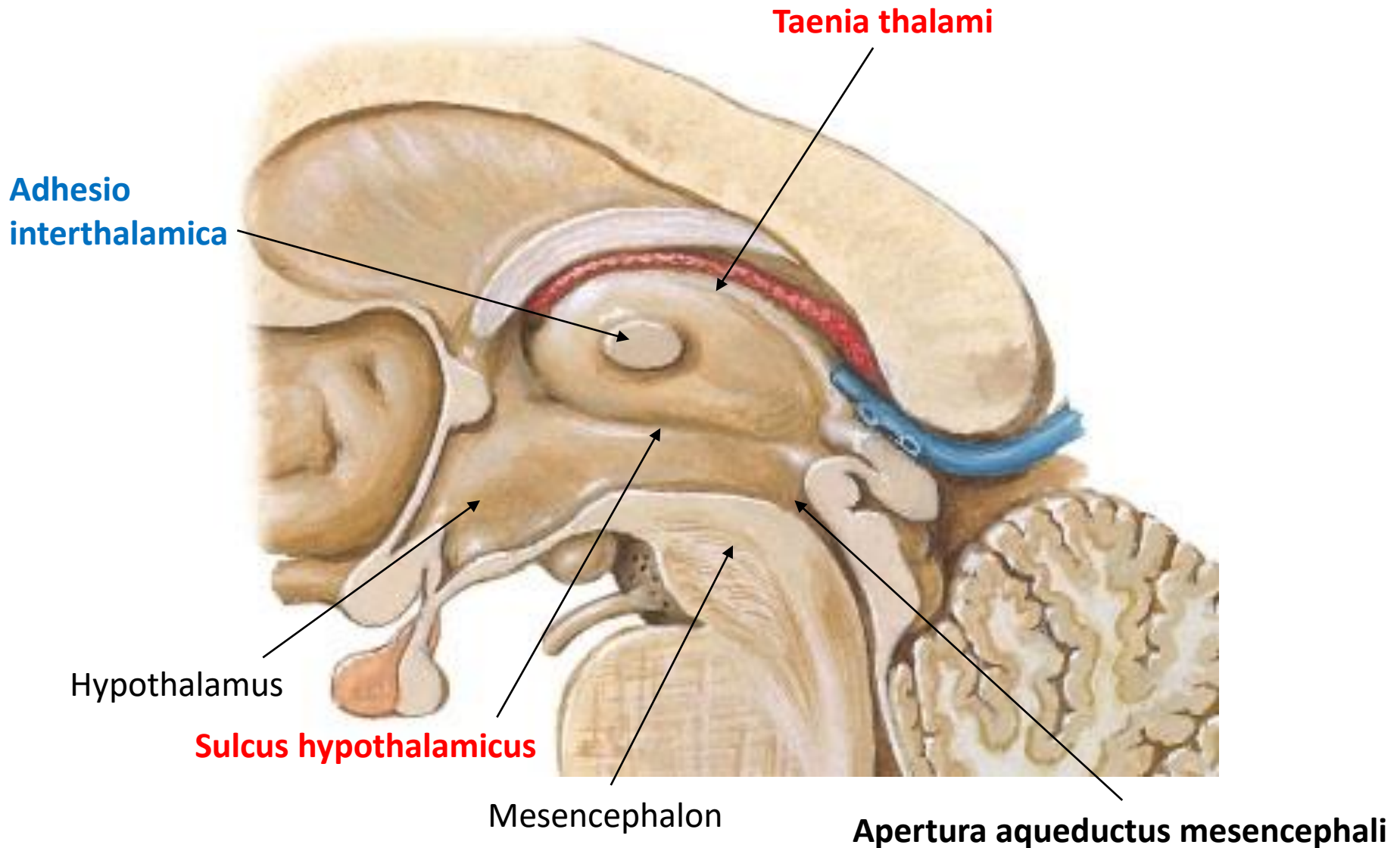
Donja strana



Donjom stranom naliježe naprijed na hypothalamus i subthalamus, pozadi na tegmentum mesencephali

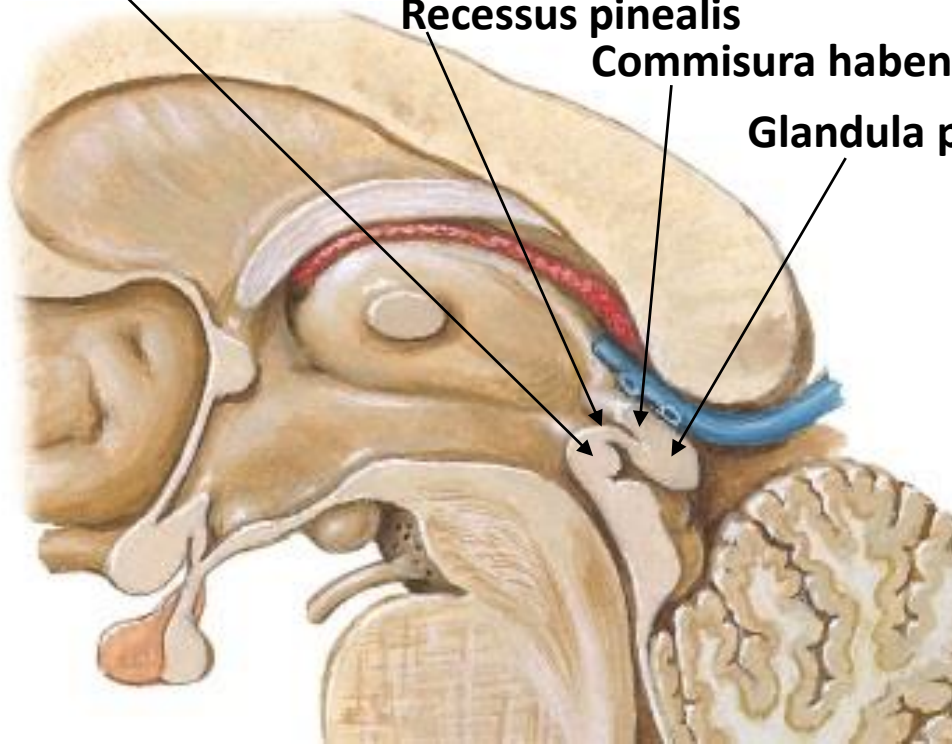
THALAMUS

Unutrašnja
strana

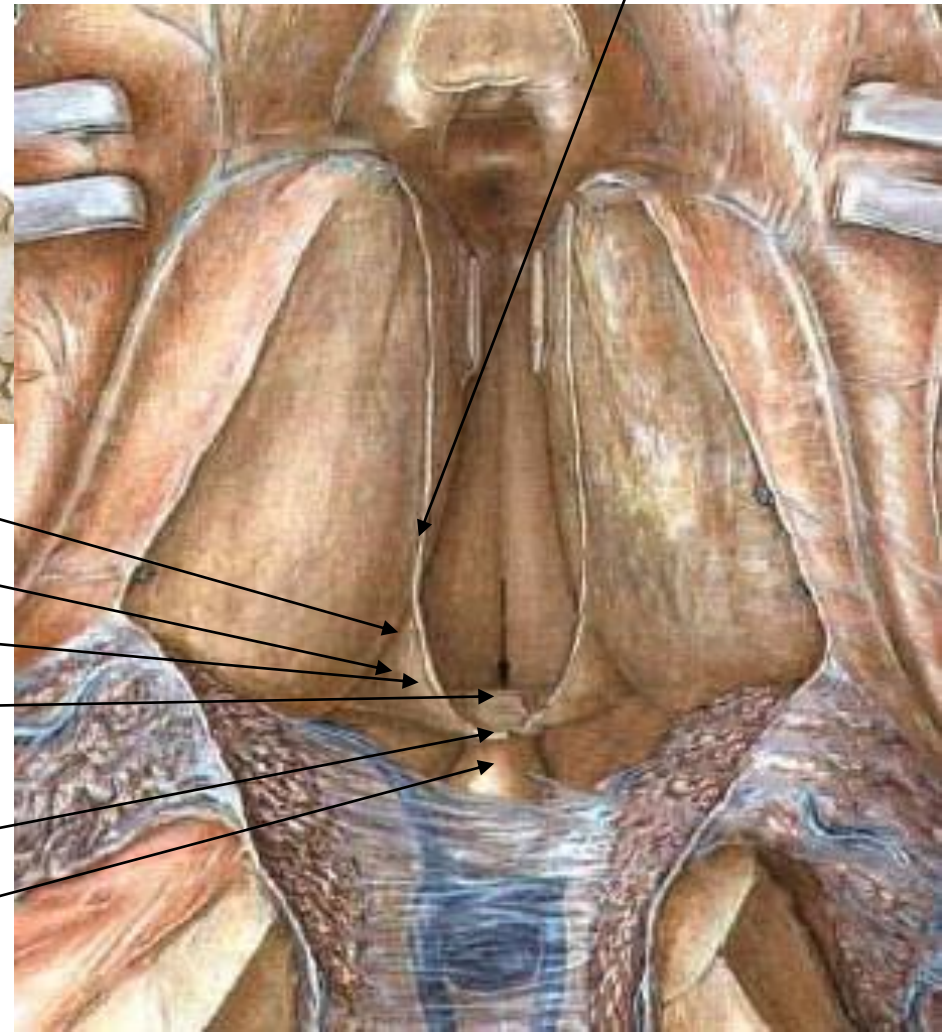


EPITHALAMUS

Commisura posterior
Recessus pinealis
Commisura habenularum
Glandula pinealis



STRIA MEDULLARIS THALAMI



SULCUS HABENULARIS

TRIGONUM HABENULARE

HABENULA

COMMISSURA POSTERIOR

COMMISSURA HABENULARUM

GLANDULA PINEALIS

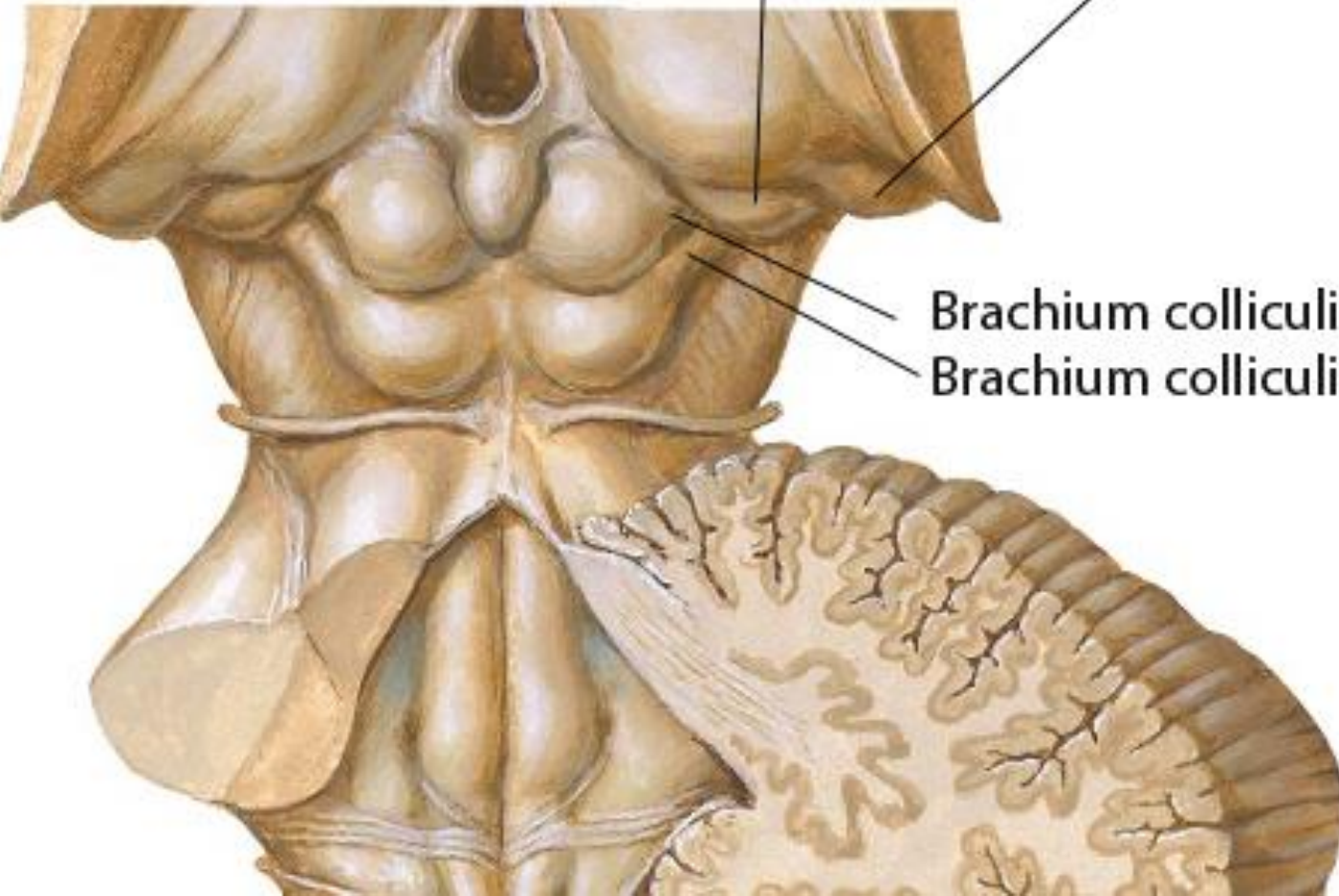
METATHALAMUS

Corpus geniculatum mediale

Corpus geniculatum laterale

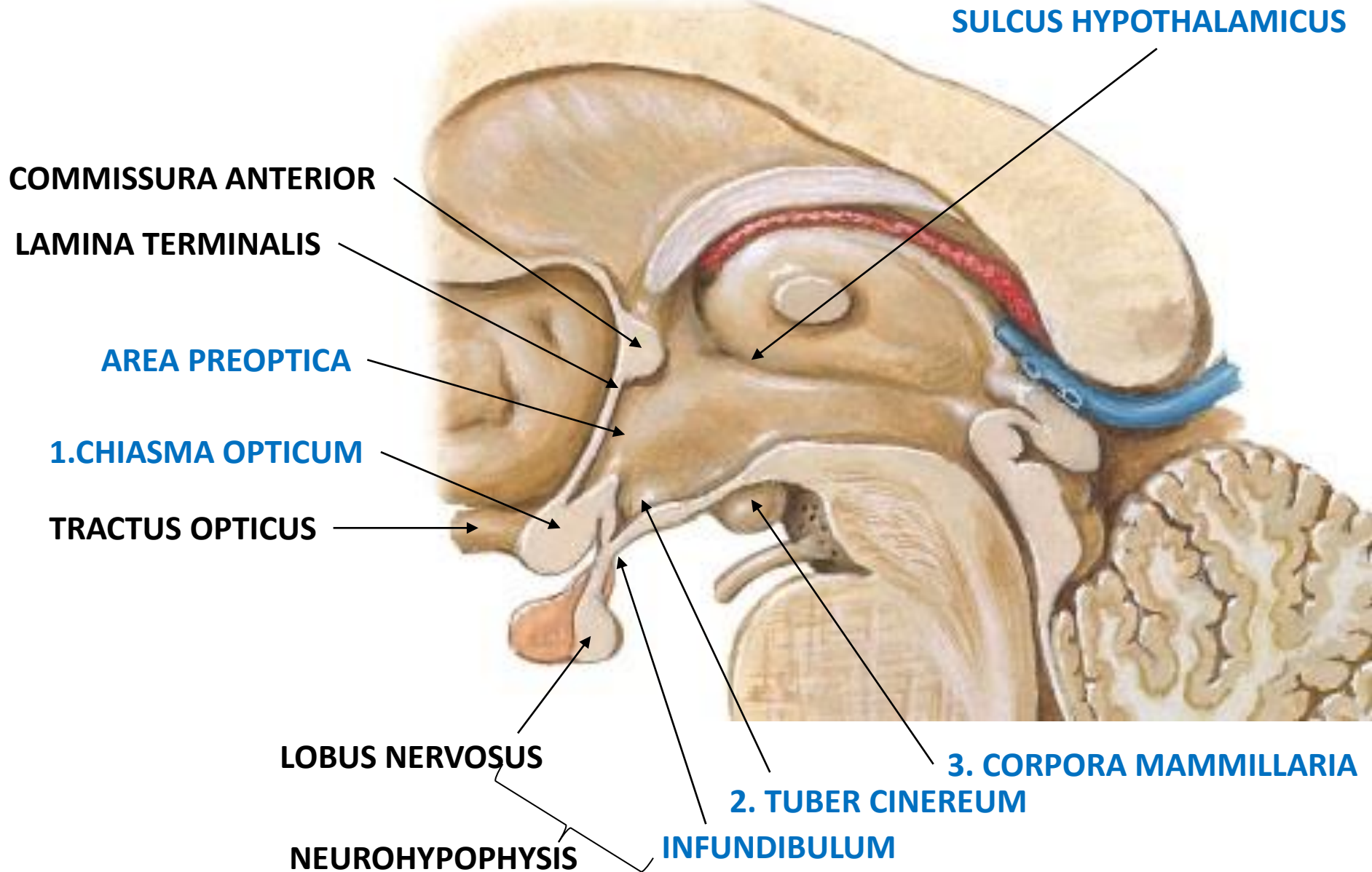
Brachium colliculi superioris

Brachium colliculi inferioris

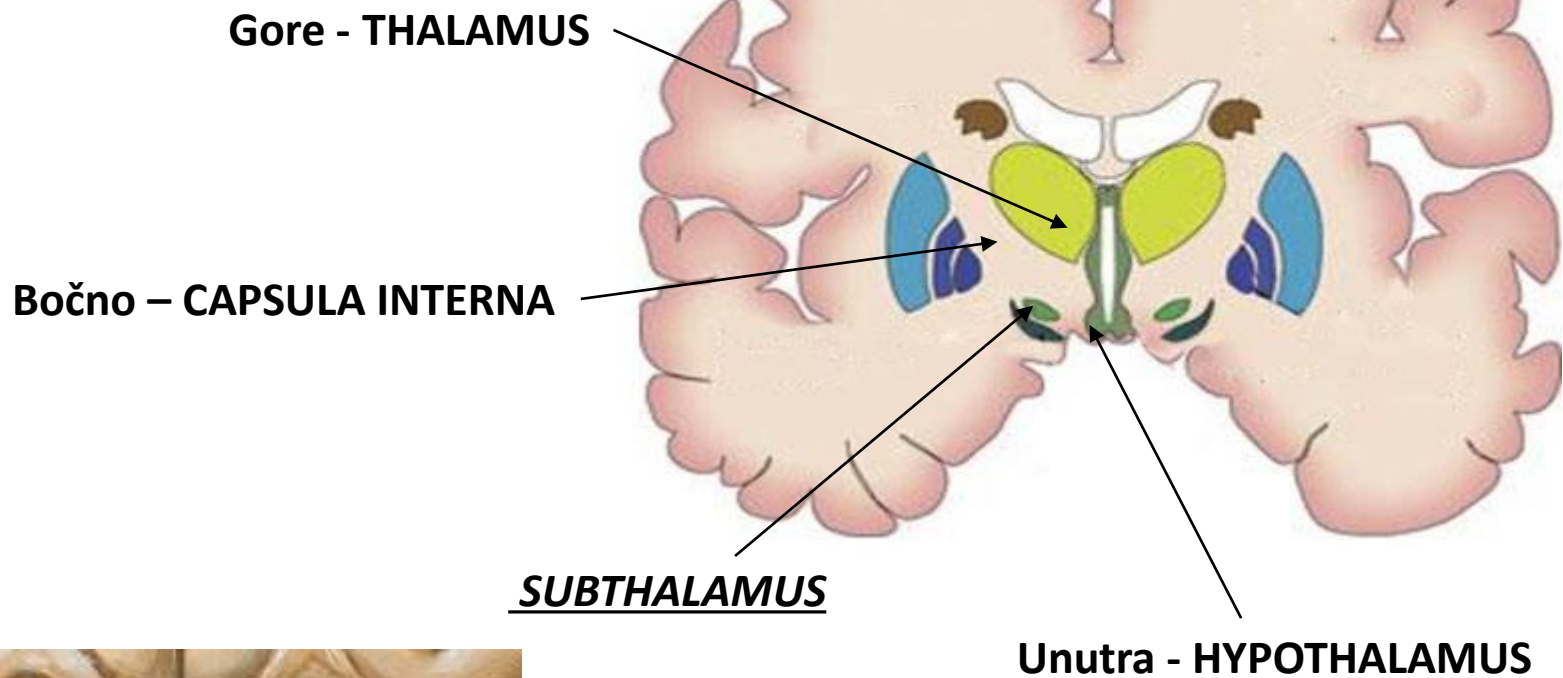


HYPOTHALAMUS

čini pod i donji do bočnog zida 3.moždane komore



SUBTHALAMUS



Dolje – CRURA CEREBRI

VENTRICULUS III

- BIKONKAVNOG OBLIKA
- Iznad nje:

- Corpus callosum
- Fornix

Taenia thalami

Gornji zid:

- LAMINA TECTORIA VENTRICULI III
- PLEXUS CHOROIDEUS VENTRICULI III

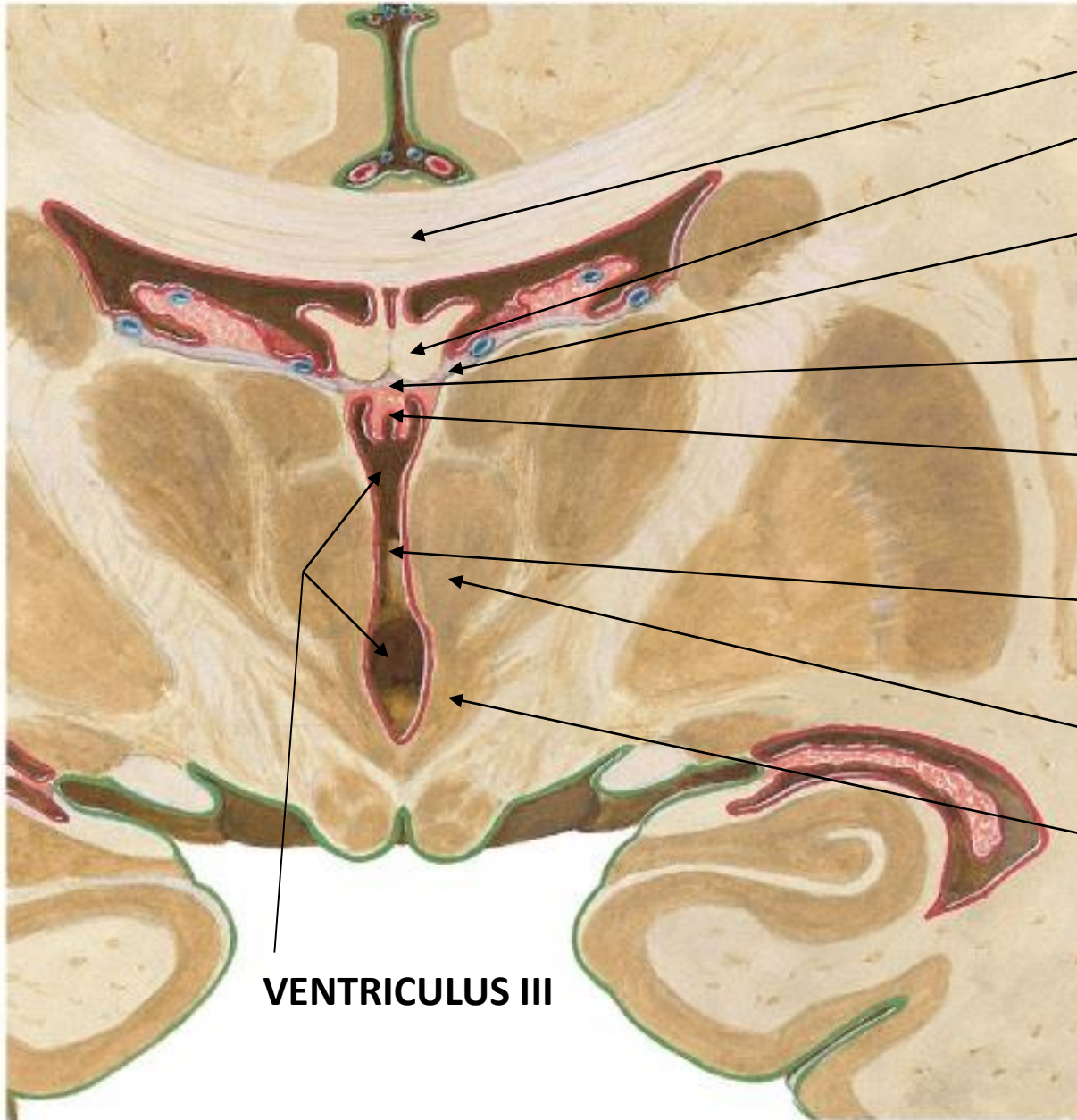
Adhesio interthalamica

Bočni zid:

- THALAMUS
- Sulcus hypothalamicus HYPOTHALAMUS

VENTRICULUS III

3.moždana komora komunicira sa bočnom moždanom komorom otvorom-foramen interventriculare-Monroi



Zadni zid:

RECESSUS SUPRAPINEALIS

COMMISSURA HABENULARUM

RECESSUS PINEALIS

COMMISSURA
POSTERIOR

APERTURA
AQUEDUCTUS
MESENCEPHALI

TEGMENTUM MESENCEPHALI

SUBSTANTIA PERFORATA POSTERIOR

CORPORA MAMMILLARIA

TUBER CINEREUM

INFUNDIBULUM

CHIASMA OPTICUM

CHIASMA OPTICUM

RECESSUS SUPRAOTICUS

LAMINA TERMINALIS

COMMISSURA ANTERIOR

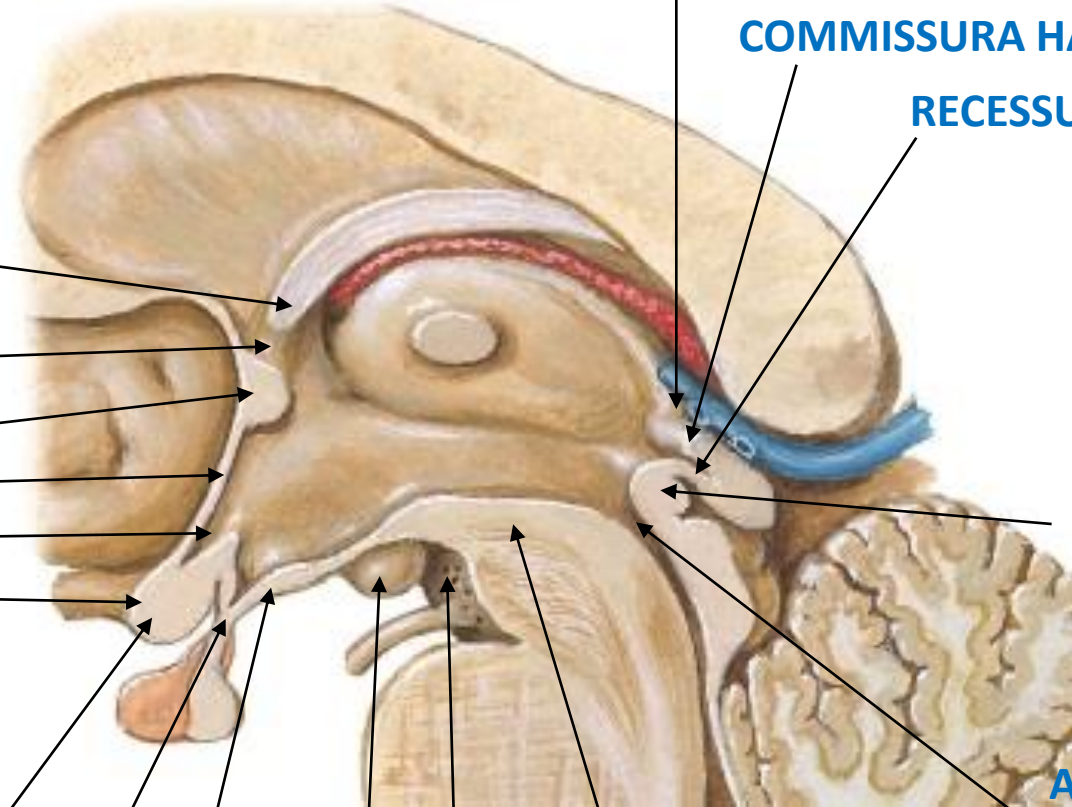
INTERVENTRICULARE

FORAMEN

COLUMNA FORNICIS

Prednji zid:

Donji zid:



An anatomical illustration of the human ribcage and spine. The ribcage is shown in a light blue, semi-transparent style, revealing the internal structure of the ribs and the underlying spine. The spine is highlighted in a reddish-pink color, showing the vertebrae and intervertebral discs. The text "MORPHOLOGIA INTERNA" is overlaid in the center in a bold, white, sans-serif font.

MORPHOLOGIA INTERNA

THALAMUS – SUBSTANTIA GRISEA

- Nc. anteriores th
- Nc. ventrales th
- Nc. dorsales th
- Nc. intralaminares th
- Nc. mediales th
- Nc. mediani th
- Nc. reticulares th
- Nc. posteriores th

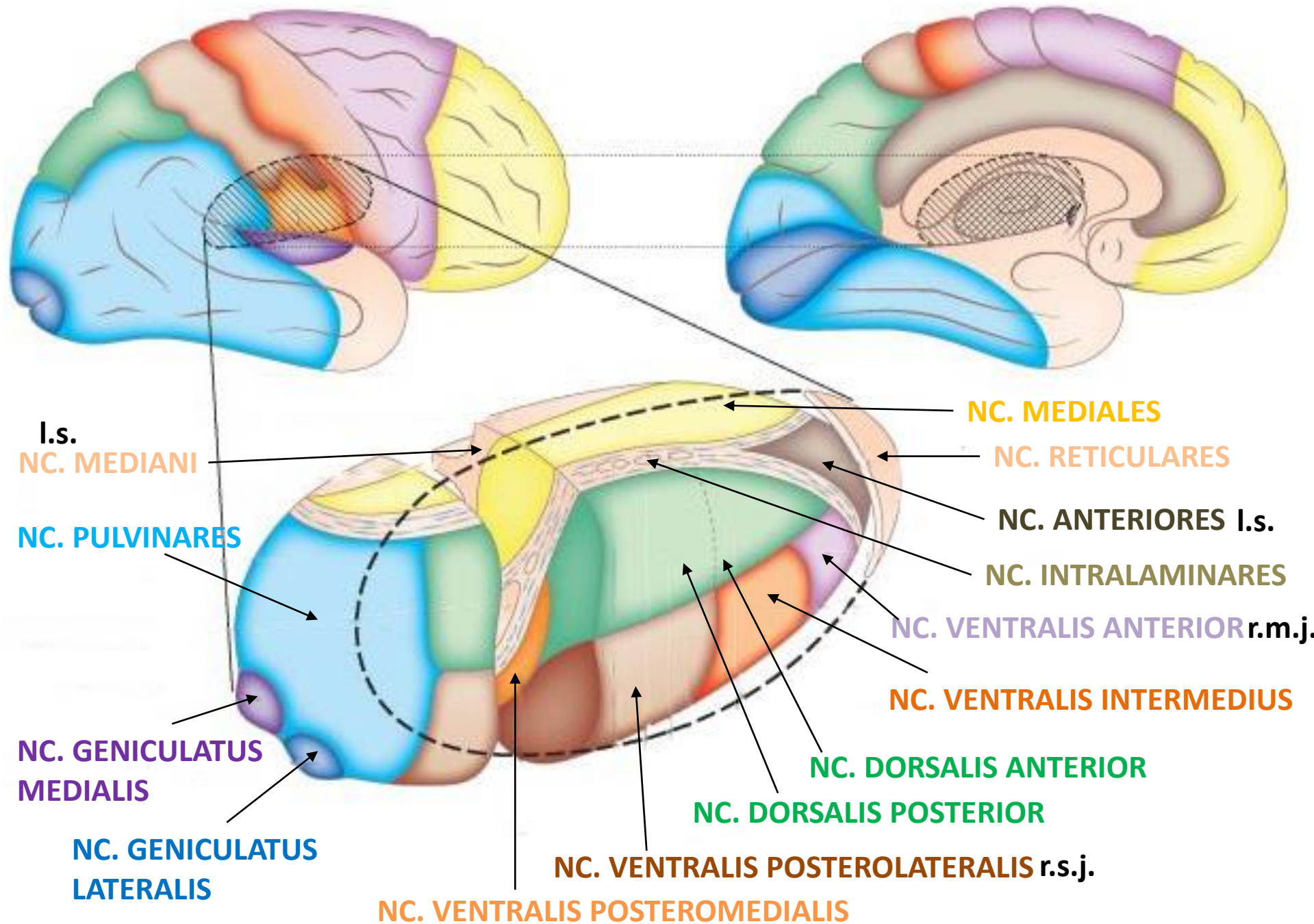
SPECIFIČNA JEDRA:

- Retikularna jedra (m.s.l.)
- Asocijativna jedra

NESPECIFIČNA JEDRA:

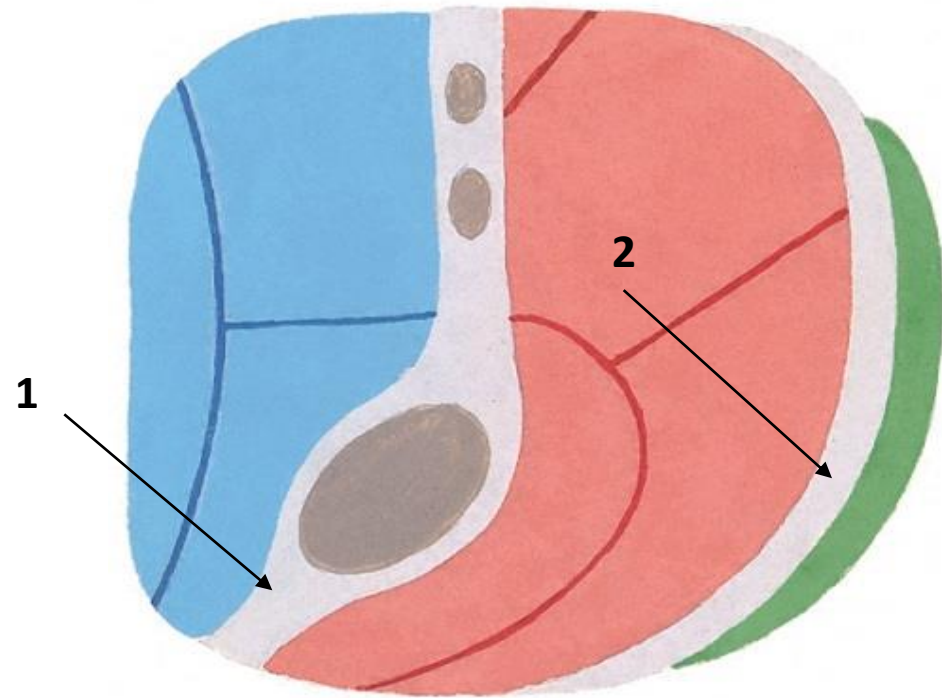
- Nc. reticulares
- Nc. intralaminares
- Nc. mediani

RF – NJ - CORTEX



THALAMUS – SUBSTANTIA ALBA

1. LAMINA MEDULLARIS MEDIALIS
2. LAMINA MEDULLARIS LATERALIS
3. STRATUM ZONALE
4. CAMPUS DORSALIS – H1



- PROJEKSIONI PUTEVI
- ASOCIJATIVNI PUTEVI
- PROJEKSIONI PUTEVI:
 - AFERENTNI
 - EFERENTNI
 - DVOSMJERNA VLAKNA:
 - Radiatio thalami

Talamus je povezan mnogobrojnim aferentnim i eferentnim putevima sa moždanim stablom i kičmenom moždinom, sa malim mozgom, hipotalamusom, bazalnim ganglionima velikog mozga i sa korom velikog mozga

RADIATIO THALAMI

Fibrae thalamocorticales et corticothalamicae – povezuju jedra thalamusa i cortex cerebri

RADIATIO ANTERIOR THALAMI

- cortex lobusa frontalis
- Prolazi kroz crus anterior capsulae internae

RADIATIO CENTRALIS THALAMI

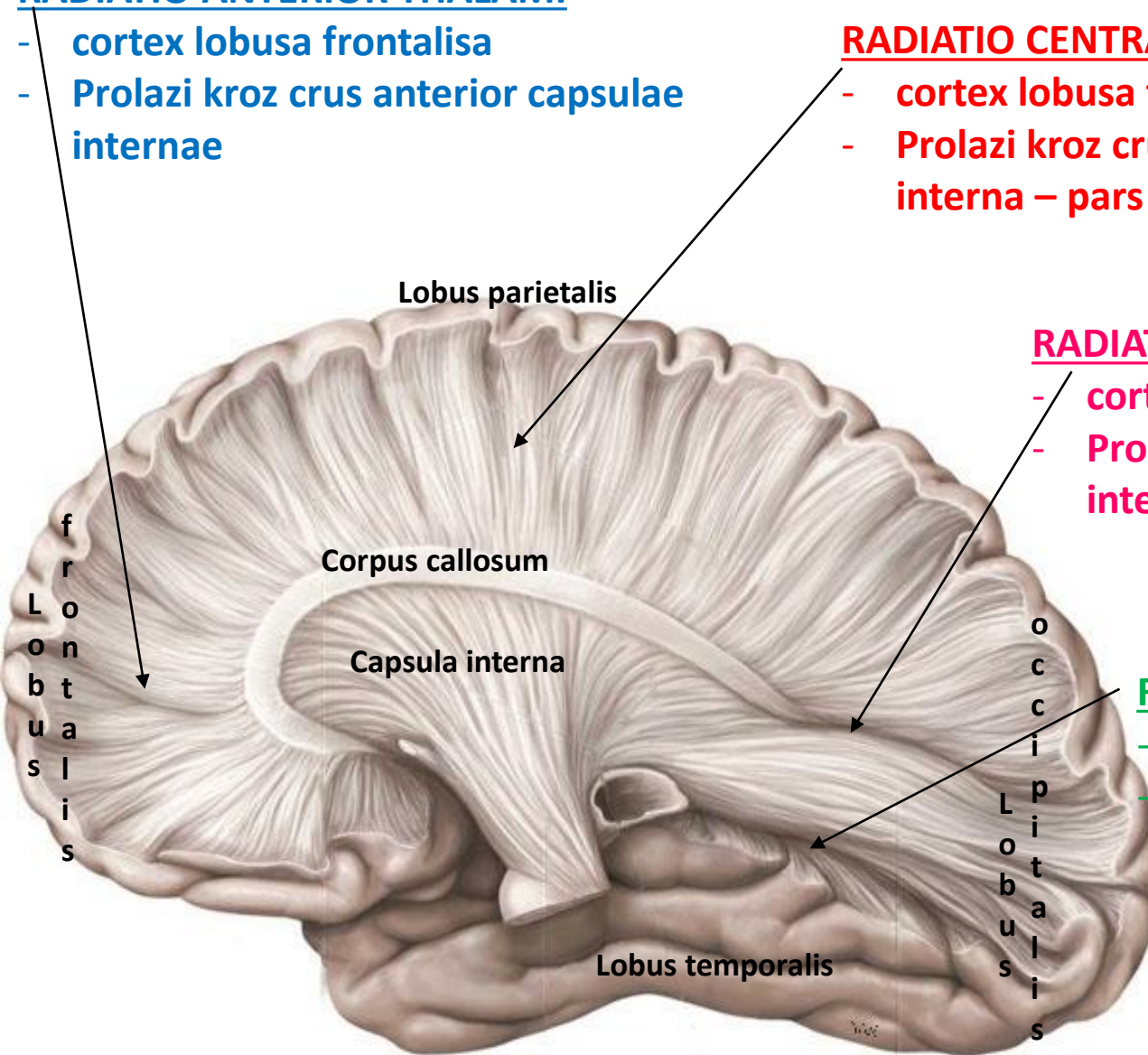
- cortex lobusa frontalis i parietalis
- Prolazi kroz crus posterior capsulae interna – pars thalamolentiformis

RADIATIO POSTERIOR THALAMI

- cortex lobusa occipitalis
- Prolazi kroz crus posterior capsulae internae – pars retrolentiformis

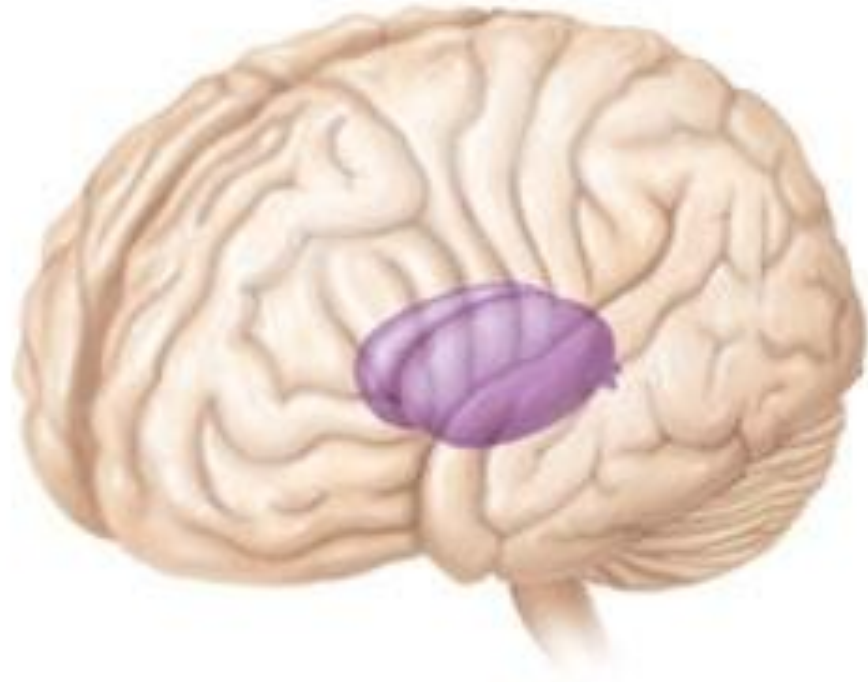
RADIATIO INFERIOR THALAMI

- cortex lobusa temporalis
- Prolazi kroz campus ventralis H2



FUNKCIJA THALAMUSA

- Glavni senzorni integrativni centar CNS
- Struktura LS
- Integrator motornih funkcija



EPITHALAMUS – SUBSTANTIA GRISEA

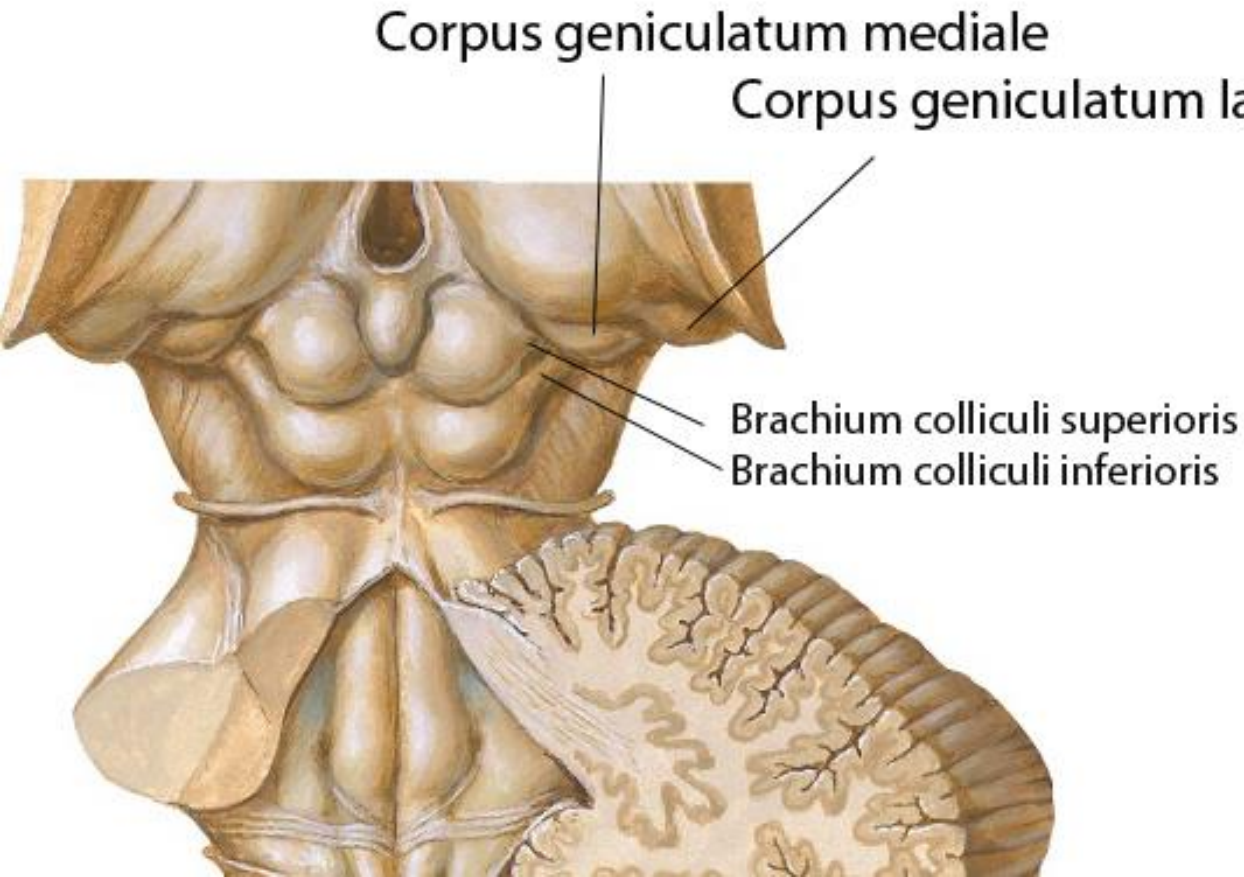
- NC. HABENULARIS MEDIALIS ET LATERALIS
- FUNKCIJA:
 - REGULACIJA VISCERALNIH I NEUROENDOKRINIH FUNKCIJA
 - KONTROLA SPAVANJA

EPITHALAMUS – SUBSTANTIA ALBA

- STRIA MEDULLARIS THALAMI
- COMMISSURA HABENULARUM
- COMMISSURA POSTERIOR S. EPITHALAMICA
- TR. HABENULOINTERPEDUNCULARIS S. FASCICULUS RETROFLEXUS

METATHALAMUS – SUBSTANTIA GRISEA

- U CORPUS GENICULATUM LATERALE – relejni subkortikalni optički centar
- U CORPUS GENICULATUM MEDIALE – relejni subkortikalni akustički centar



HYPOTHALAMUS - podjela

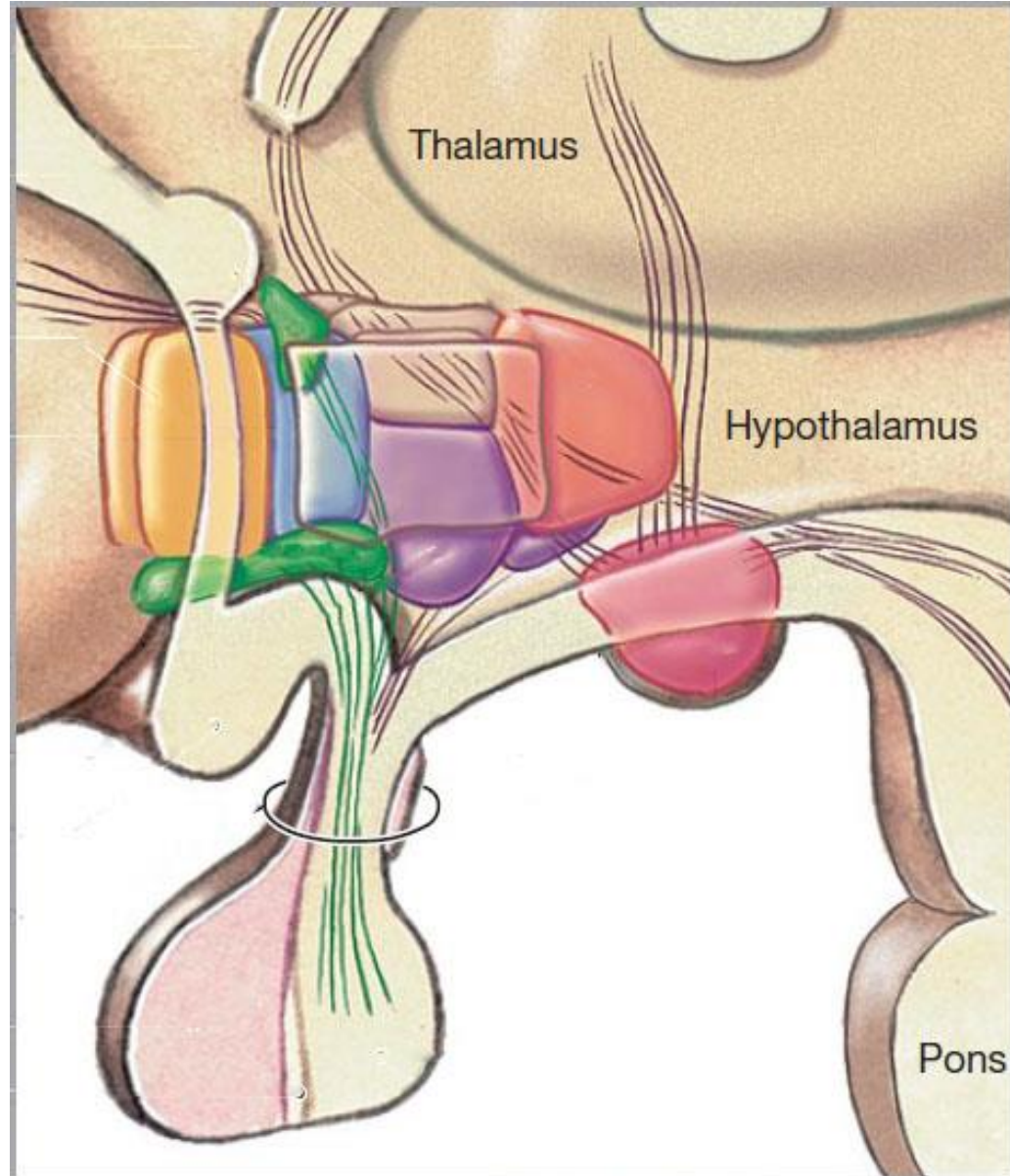
- U odnosu na morfološke strukture na ventralnoj strani:
 - Od naprijed ka pozadi – 3 predjela ili regiona
 - a) Prednji – hijazmatični ili supraoptički
 - b) Srednji – tuberalni ili tuberoinfundibularni
 - c) Zadnji – mamilarni
 - Od unutra prema spolja – 2 zone hypothalamusa (zonae hypothalamicae)
 1. Unutrašnja ili medijalna – zona medialis
 2. Spoljašnja ili lateralna – zona lateralis

HYPOTHALAMUS – SUBSTANTIA GRISEA

Siva masa hypothalamusa je predstavljena njegovim jedrima koja su raspoređena u pet regija:

- Regio hypothalamica anterior
- Regio hypothalamica intermedia
- Regio hypothalamica lateralis
- Regio hypothalamica posterior
- Regio hypothalamica dorsalis

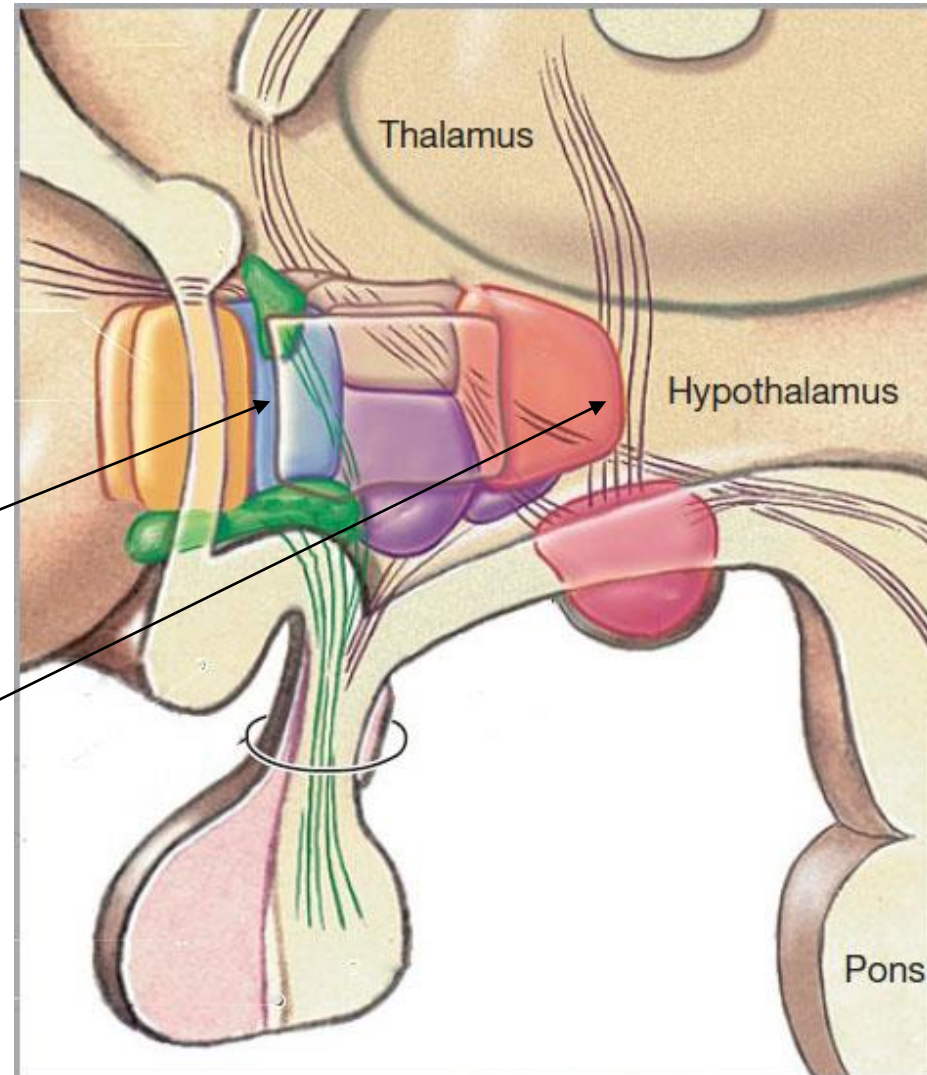
Hypothalamus ulestvuje u kontroli termoregulacije, muškog polnog nagona, materinskog instinkta, u njegovim jedrima su centri za glad i žeđ tako da učestvuje u regulaciji uzimanja hrane i tečnosti, zatim kontroli kardiovaskularnog sistema, regulaciji pritiska, srčanog ritma, sekrecije prolaktina i hormona rasta, kao i lučenje hormona koji regulišu lučenje adenohipofize, učešće u nastajanju stresa, limbička...



HYPOTHALAMUS – SUBSTANTIA GRISEA

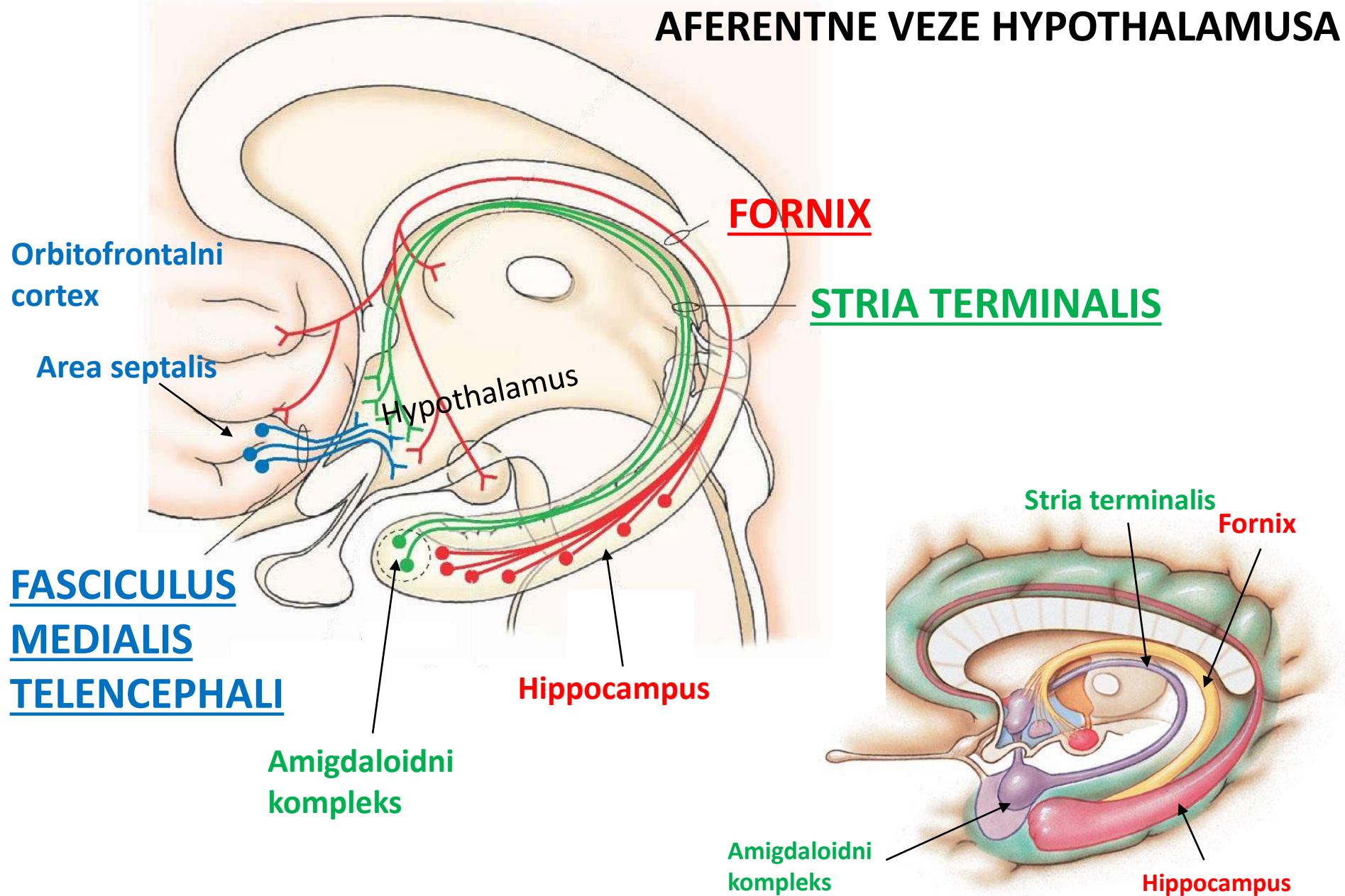
U hypothalamusu je i eferentni centar autonomnog nervnog sistema

PREDNJI DIO HTH – PSY,
vazodilatacija, smanjenje KP,
usporen rad srca
ZADNJI DIO HTH – SY,
vazokonstrikcija, porast KP, ubrzan
srčani rad



HYPOTHALAMUS – SUBSTANTIA ALBA

AFERENTNE VEZE HYPOTHALAMUSA



HYPOTHALAMUS – SUBSTANTIA ALBA

EFERENTNE VEZE HYPOTHALAMUSA

Jedan od najvažnijih puteva hypothalamusa je fasciculus longitudinalis dorsalis. Hypothalamus dobija informacije iz visceralnih organa, kore velikog mozga i limbičkog sistema, i pomoću ovog puta na osnovu tih informacija kontroliše funkciju unutrašnjih organa.

Nc. supraopticus
Nc. paraventricularis
Nc. tuberis

Nc. oculomotorius
accessorius

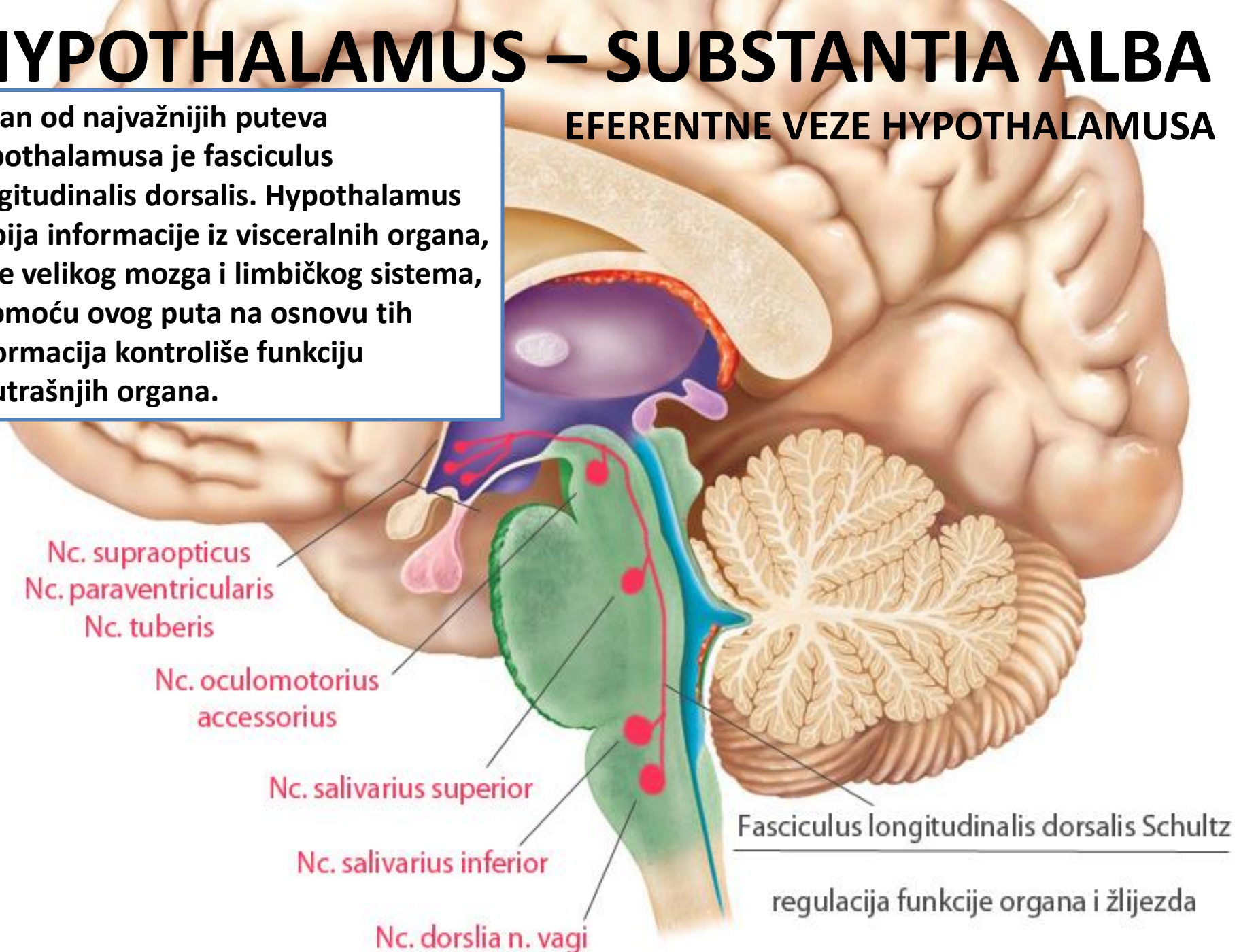
Nc. salivarius superior

Nc. salivarius inferior

Nc. dorsalis n. vagi

Fasciculus longitudinalis dorsalis Schultz

regulacija funkcije organa i žlijezda



SUBTHALAMUS

Bijelu masu subtalamusa čine putevi koji obrazuju Forelova perizonalna polja:

- **Campus dorsalis H1**
- **Campus ventralis H2**
- **Campus medialis H**

FASCICULUS THALAMICUS

H1

H

H2

ZI

NS

Capsula interna

FASCICULUS LENTICULARIS

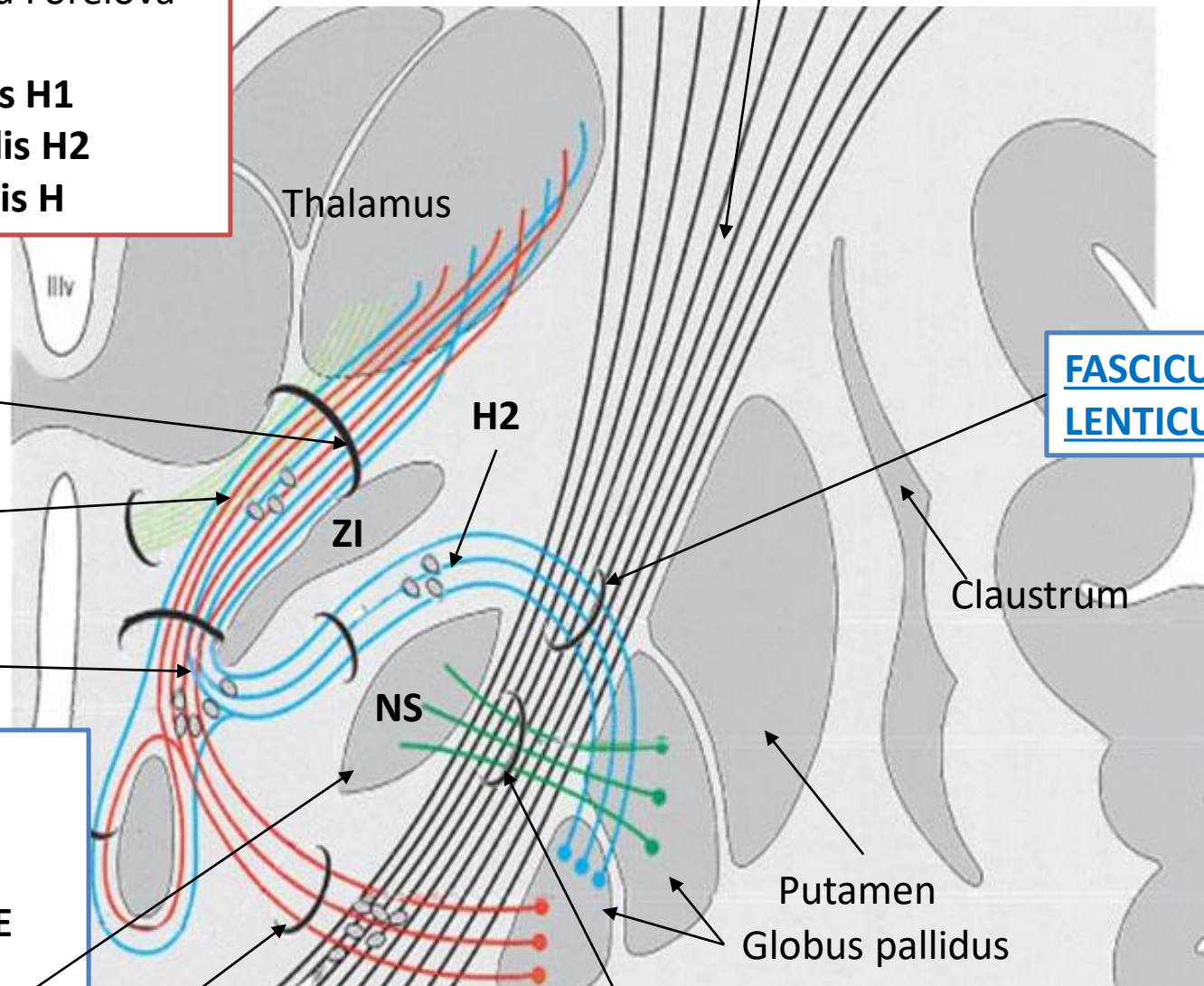
Clastrum

Putamen

Globus pallidus

ANSA LENTICULARIS

FASCICULUS SUBTHALAMICUS



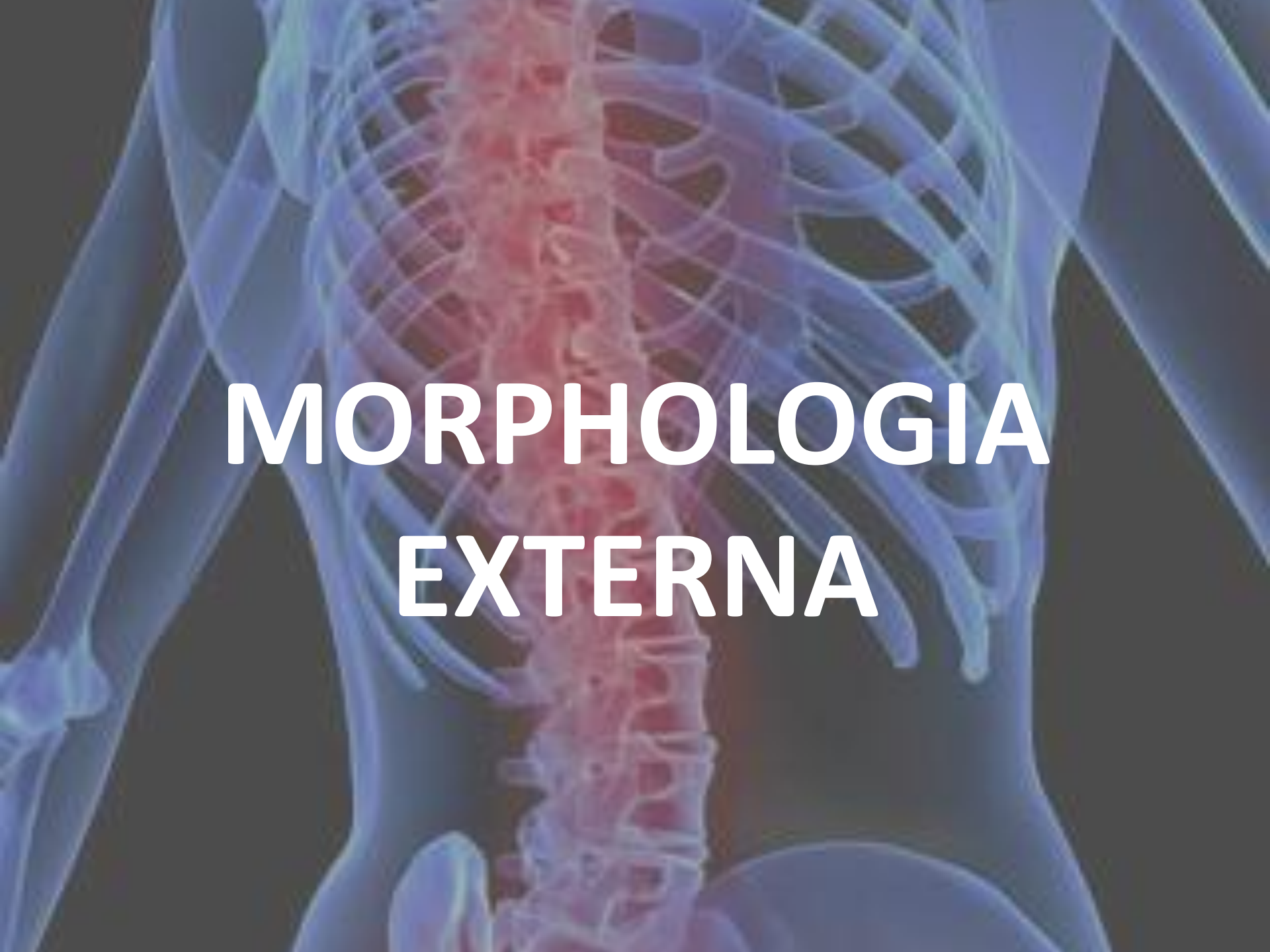
SIVU MASU SUBTHALAMUSA PREDSTAVLJAJU JEDRA, OD KOJIH JE NAJVEĆE NC. SUBTHALAMICUS



Veliki mozak

A semi-transparent blue human skeleton is shown from the front, with a red glow highlighting the spine. The text is overlaid on the image.

**TELENCEPHALON S.
CEREBRUM –
VELIKI MOZAK**

A 3D rendering of a human skeleton in a light blue color. The spine is highlighted in a reddish-pink color, running vertically down the center of the image. The ribs are visible on both sides, and the pelvis is at the bottom. The text is centered over the spine.

MORPHOLOGIA EXTERNA

D= 16 cm
Š= 14 cm
V= 12 cm

M – 1100 – 1450 g
Ž – 1000 – 1300 g
minT= 800 – 950 g
maxT= 1800 – 2000 g
2,5% od TT

HEMISPHERIUM CEREBRI

FISSURA LONGITUDINALIS
CEREBRALIS

CORPUS CALLOSUM

POLUS FRONTALIS

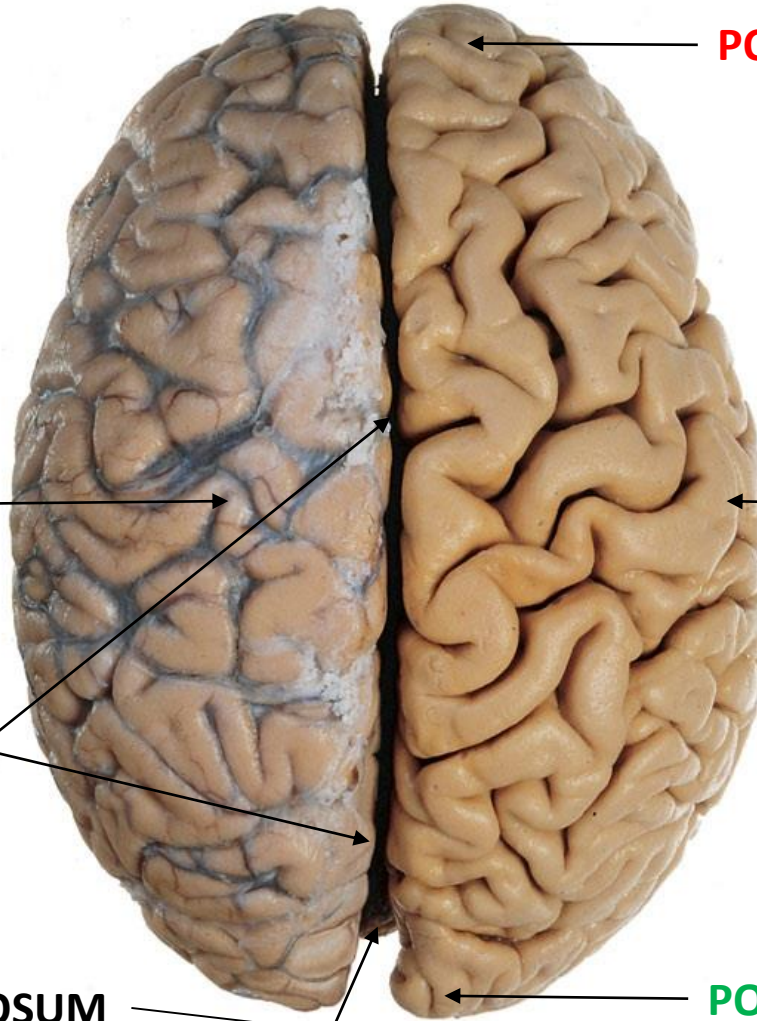
Prednji pol

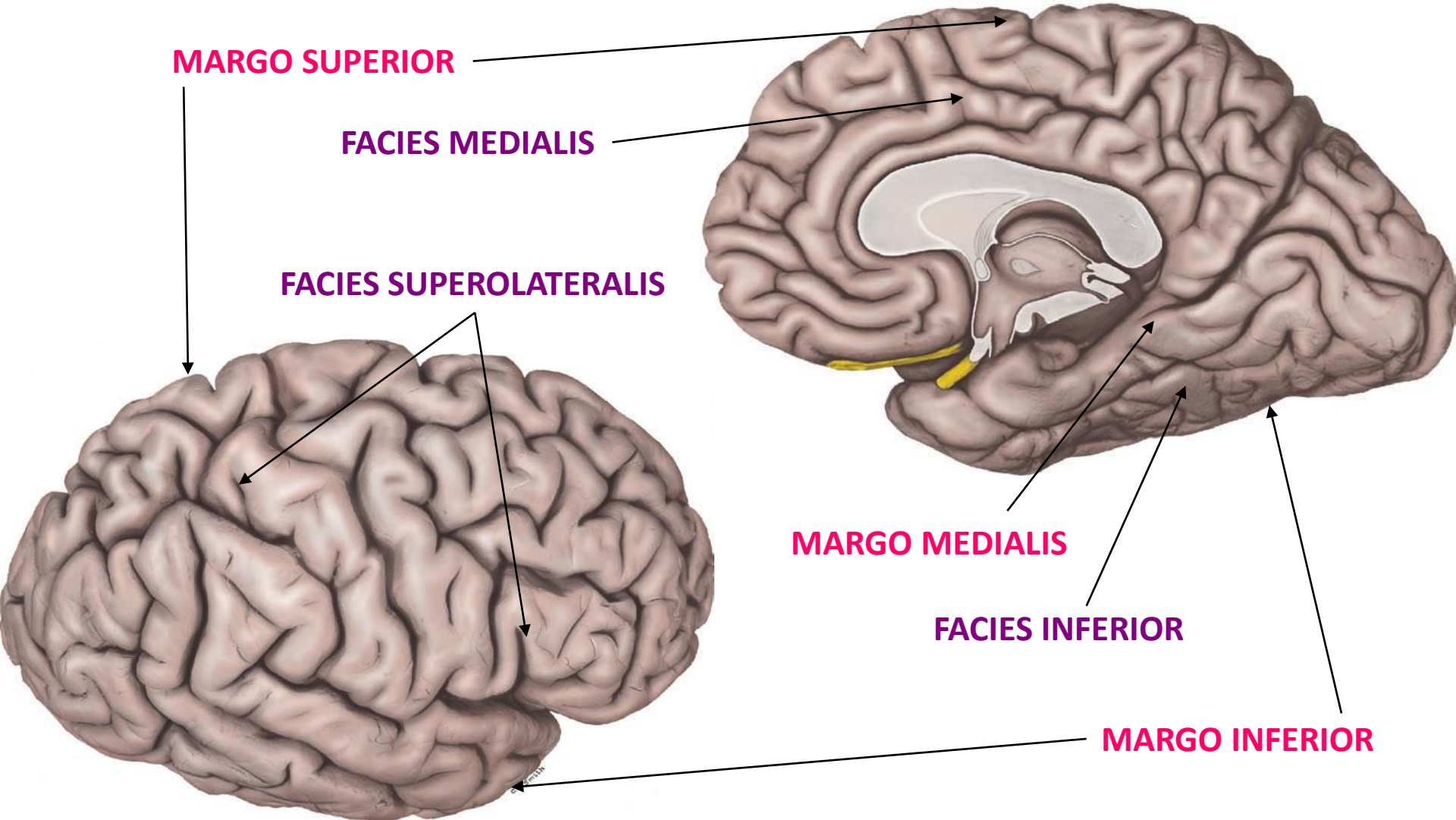
POLUS TEMPORALIS

Bočni pol

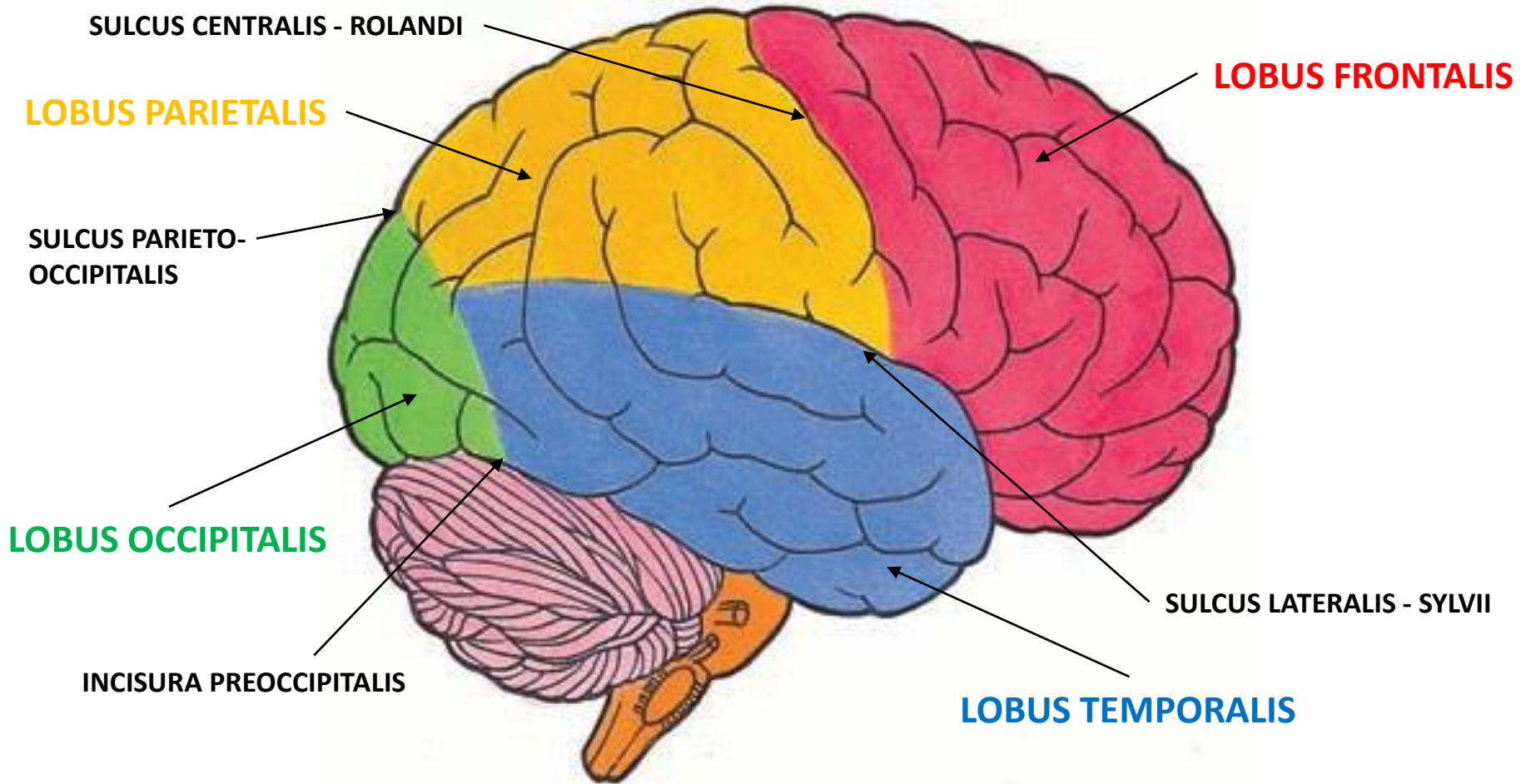
Zadnji pol

POLUS OCCIPITALIS



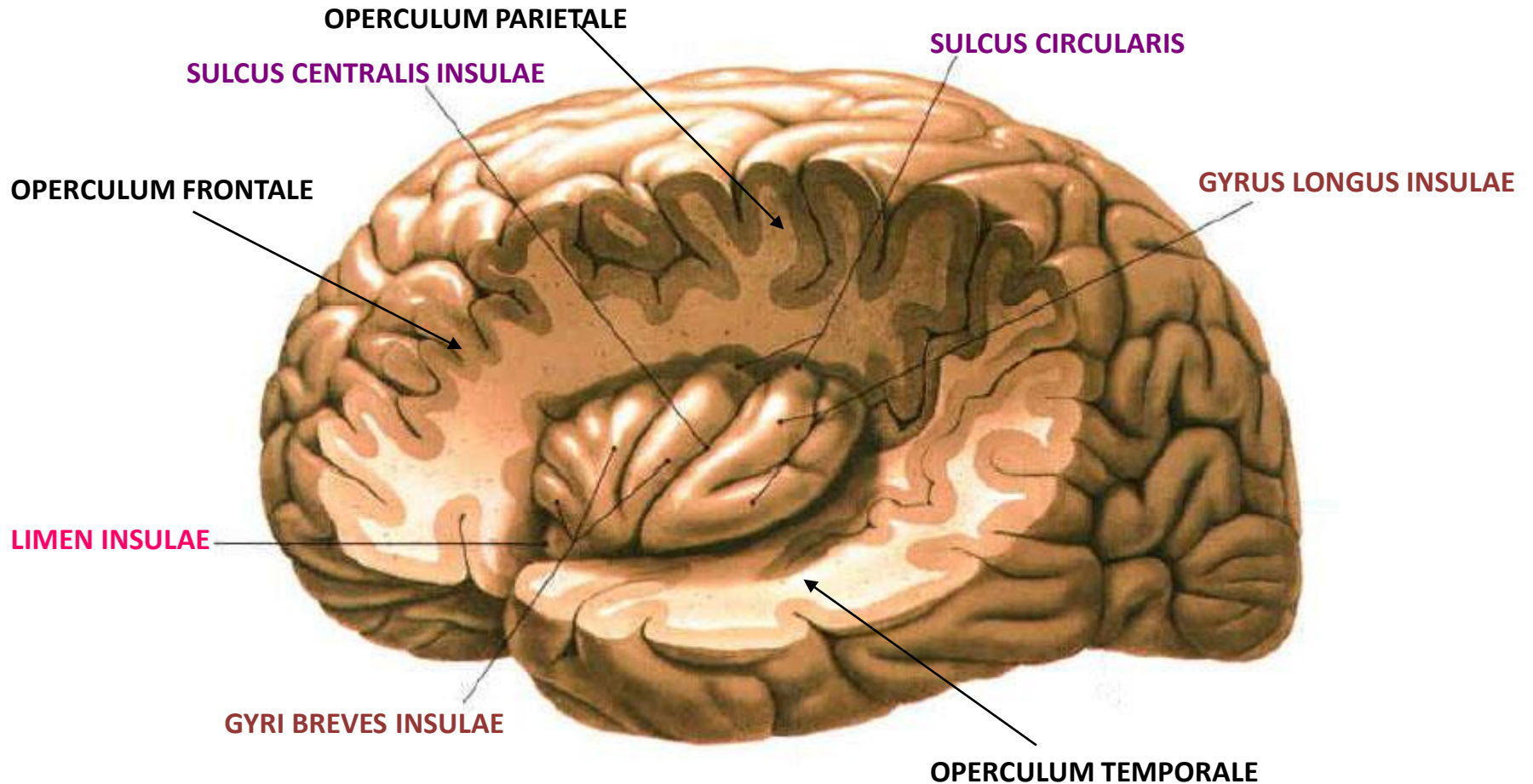


FACIES SUPEROLATERALIS HEMISPHERII



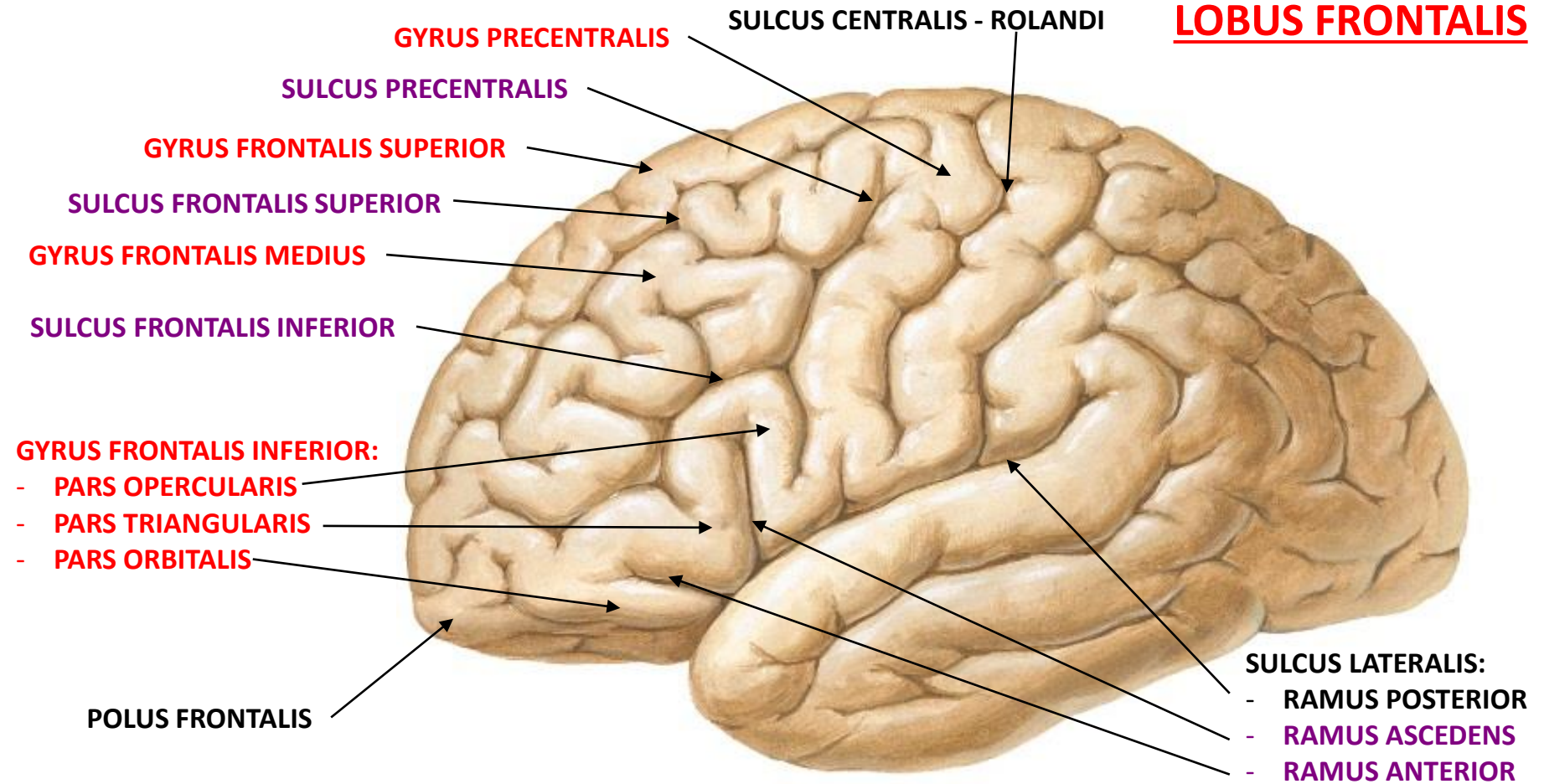
FACIES SUPEROLATERALIS HEMISPHERII

LOBUS INSULARIS – INSULA – Reilovo ostrvce

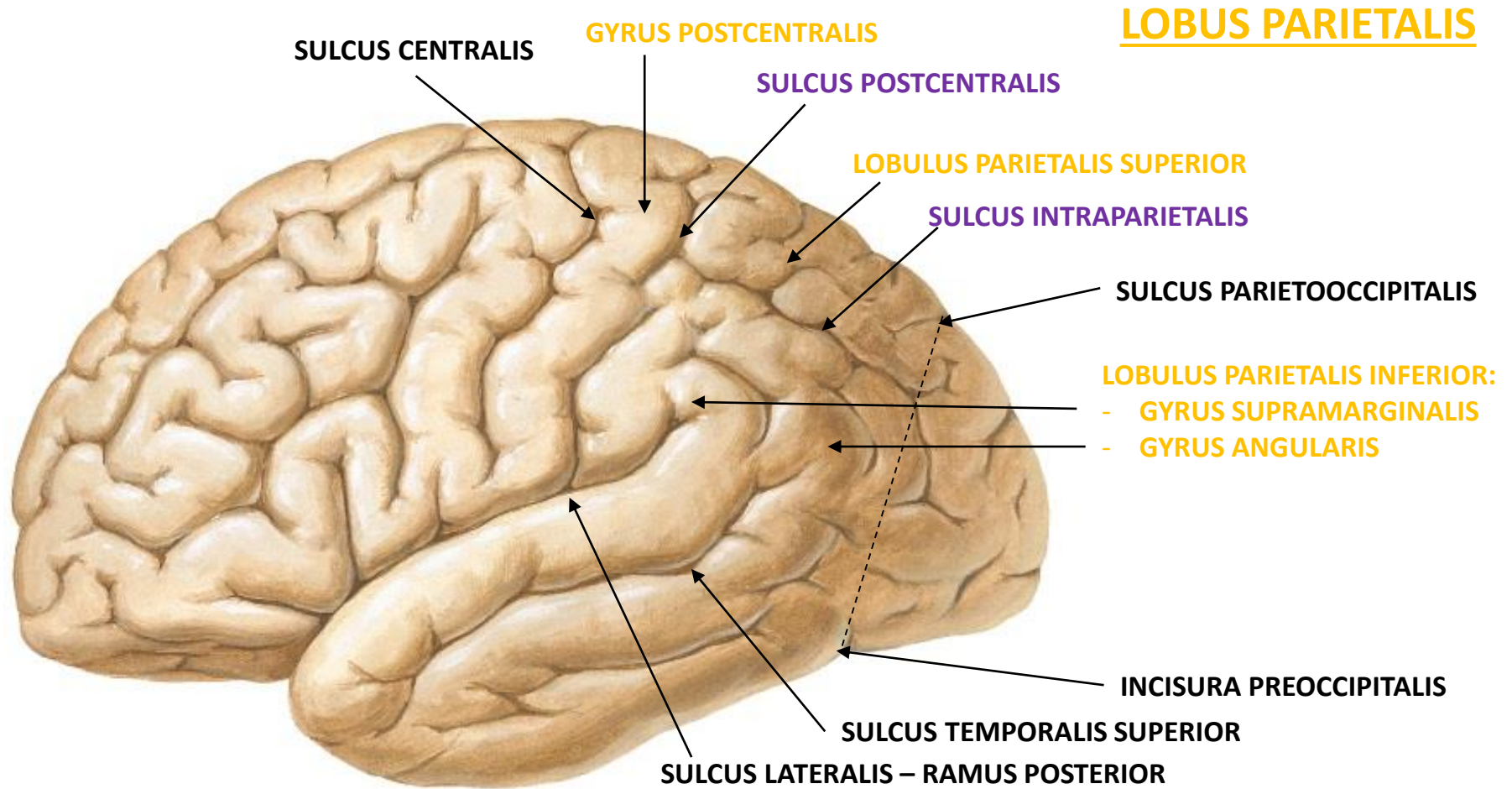


FACIES SUPEROLATERALIS HEMISPHERII

LOBUS FRONTALIS

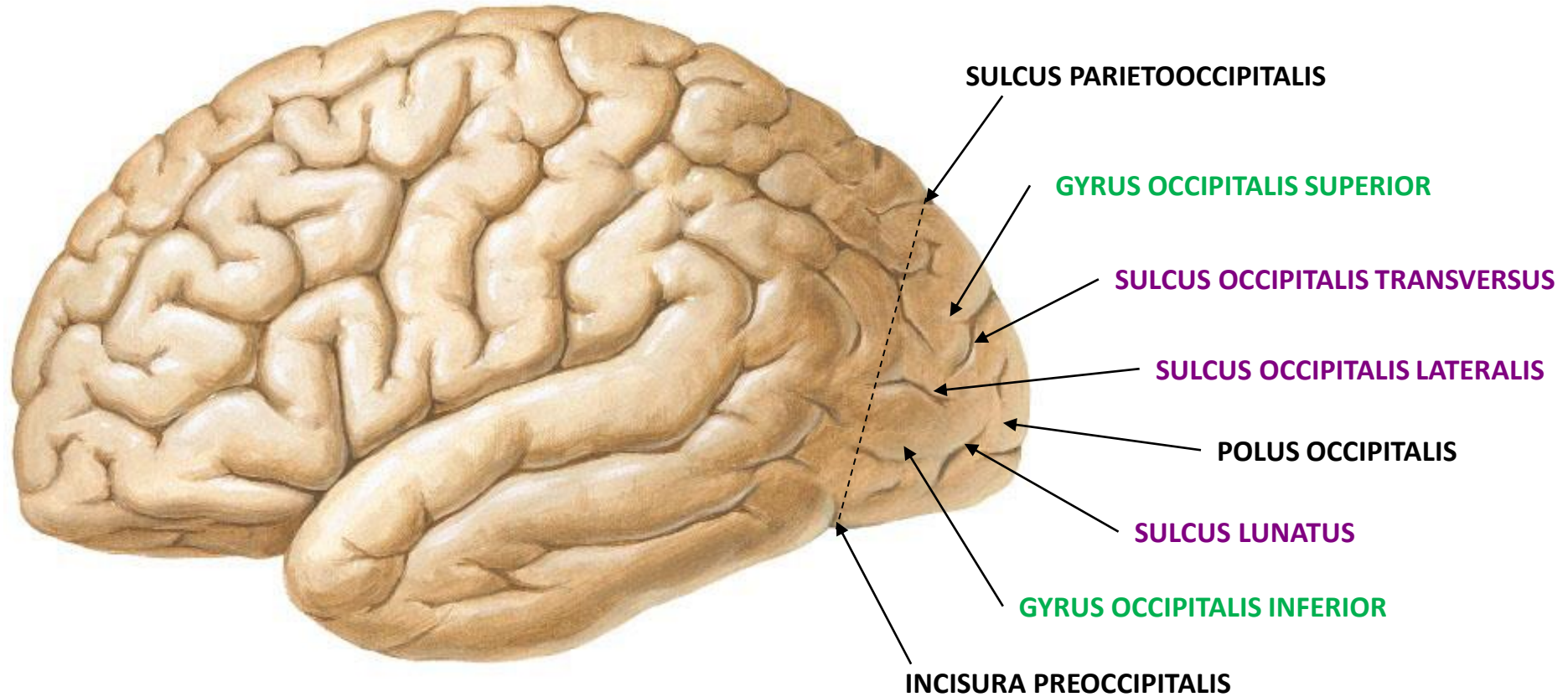


FACIES SUPEROLATERALIS HEMISPHERII

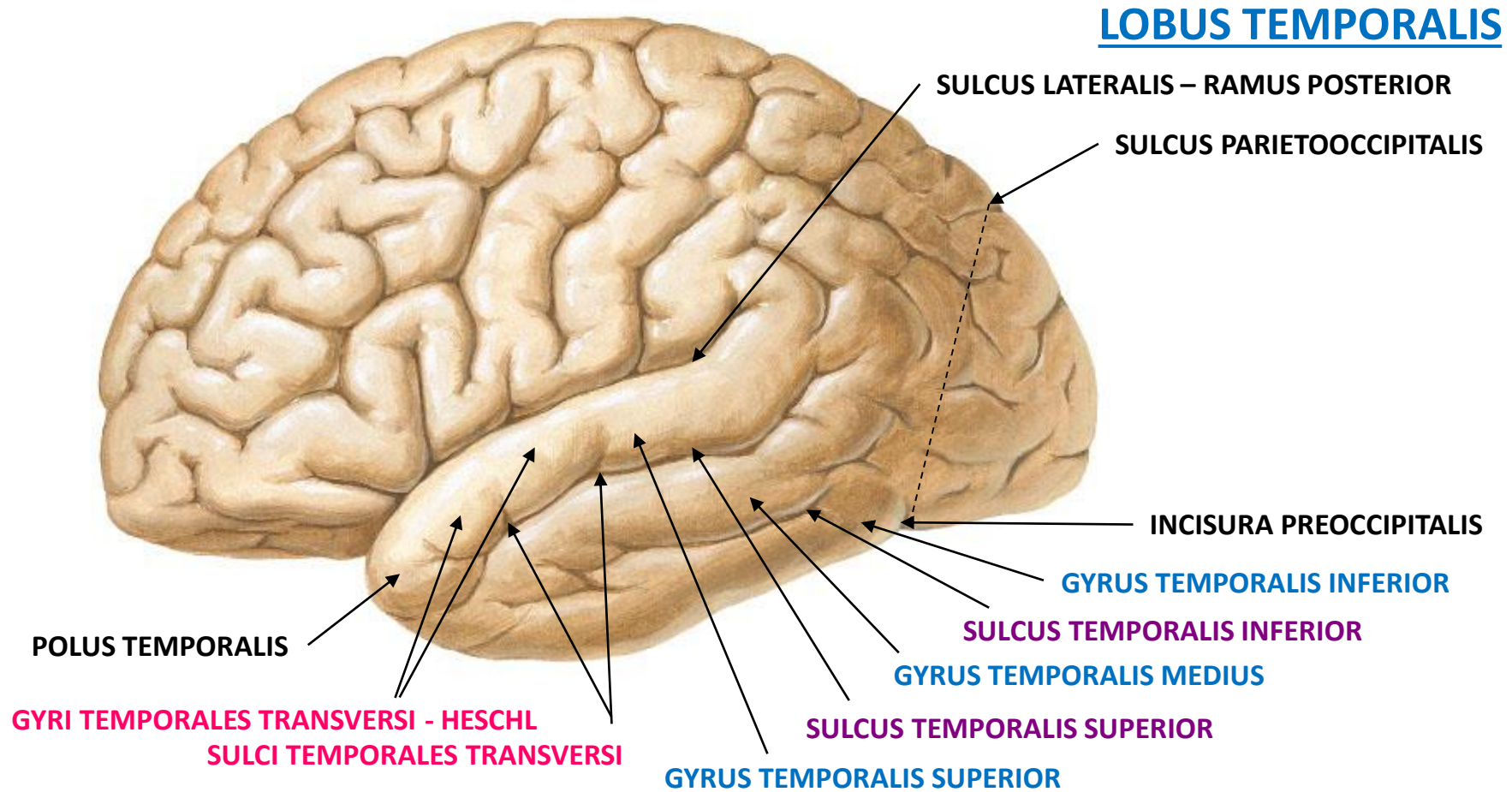


FACIES SUPEROLATERALIS HEMISPHERII

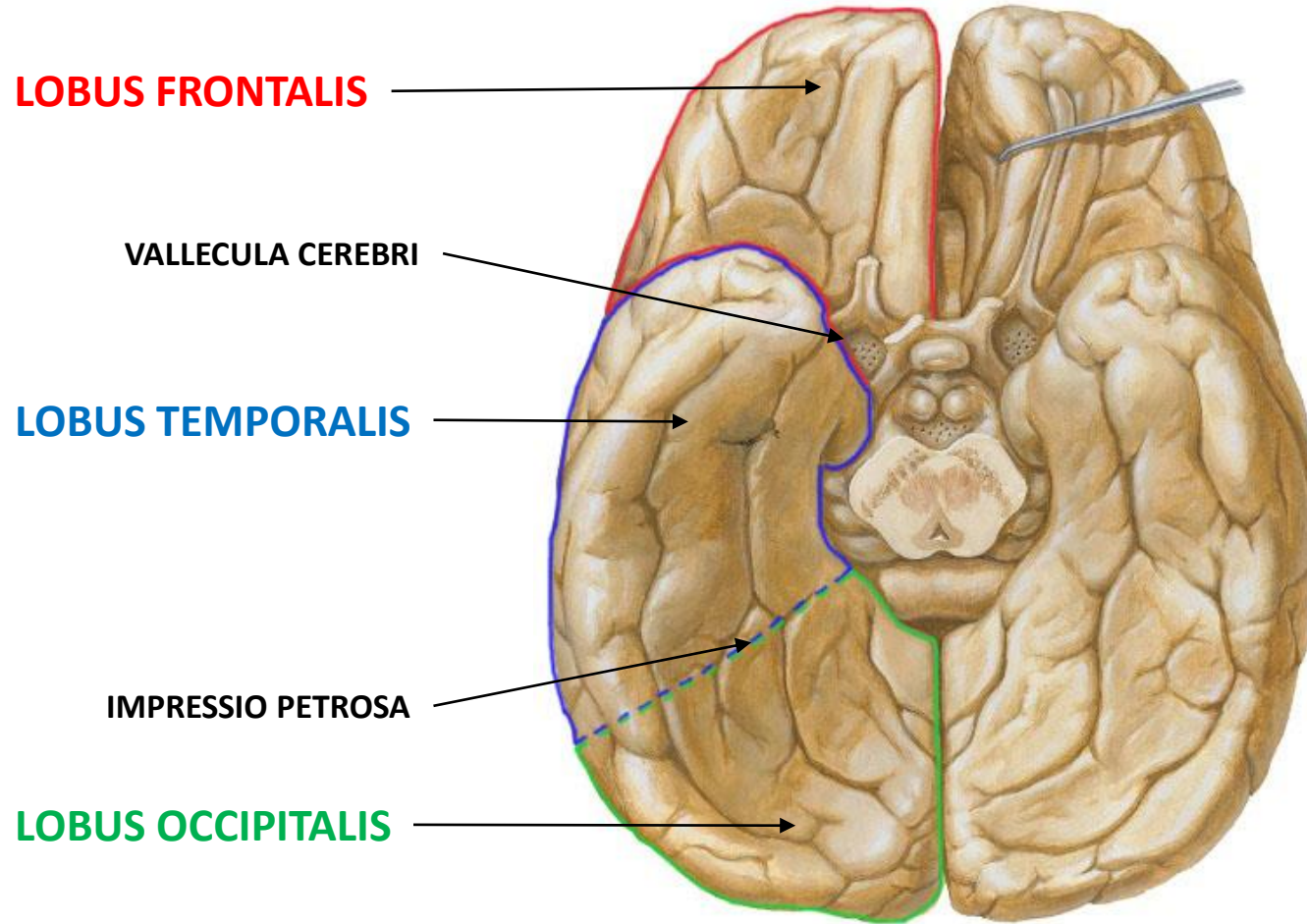
LOBUS OCCIPITALIS



FACIES SUPEROLATERALIS HEMISPHERII

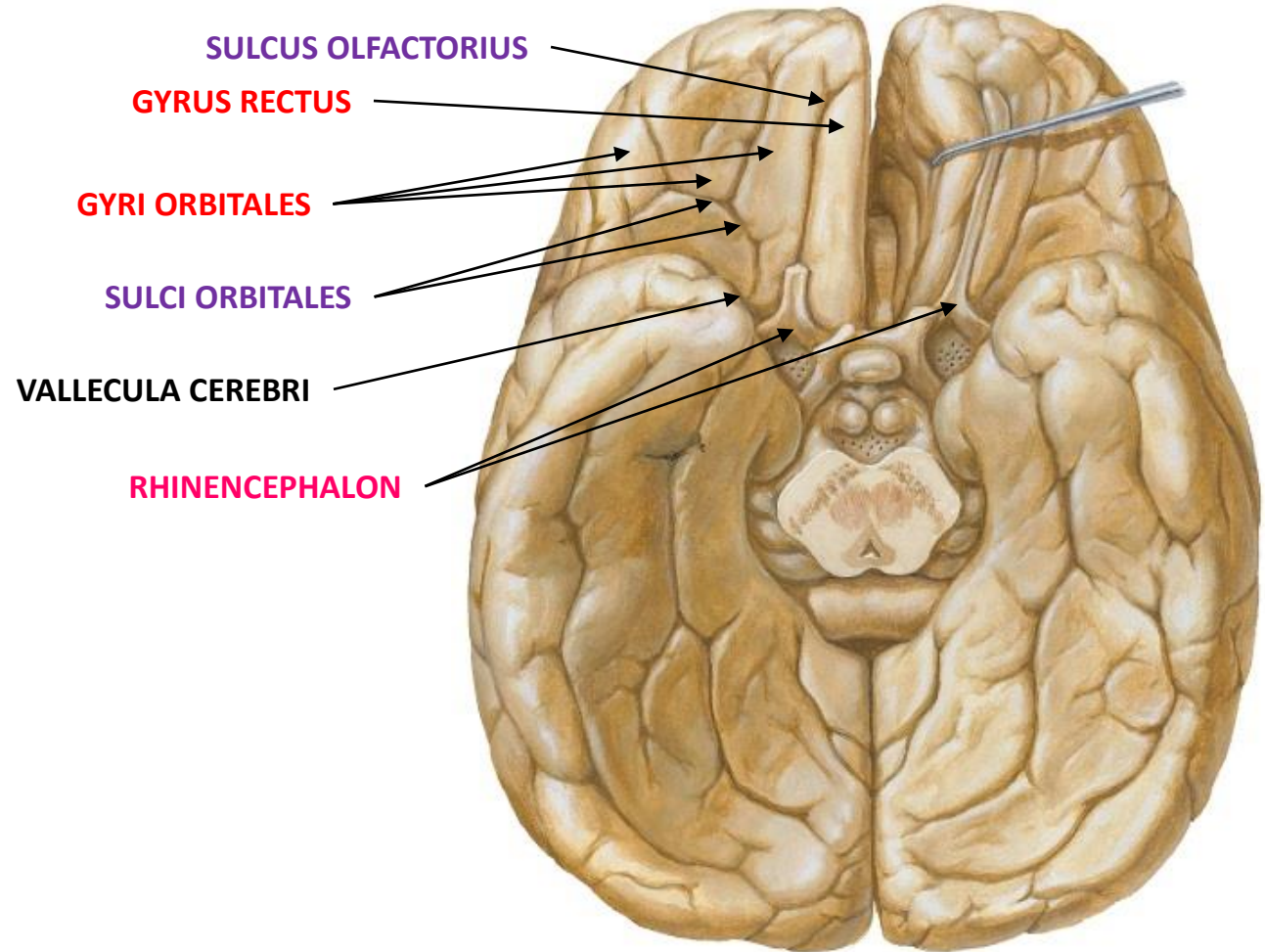


FACIES INFERIOR HEMISPHERII



FACIES INFERIOR HEMISPHERII

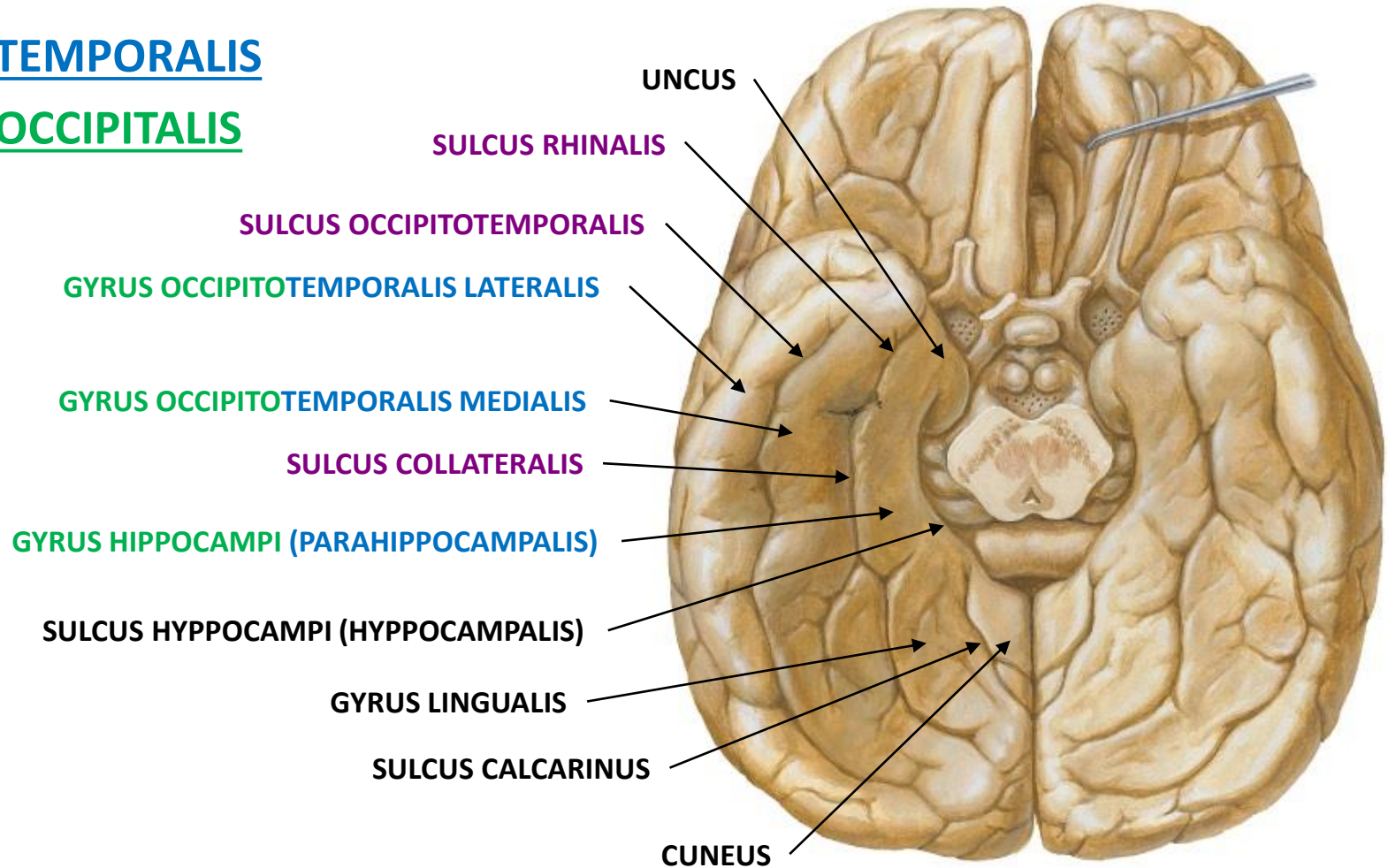
LOBUS FRONTALIS



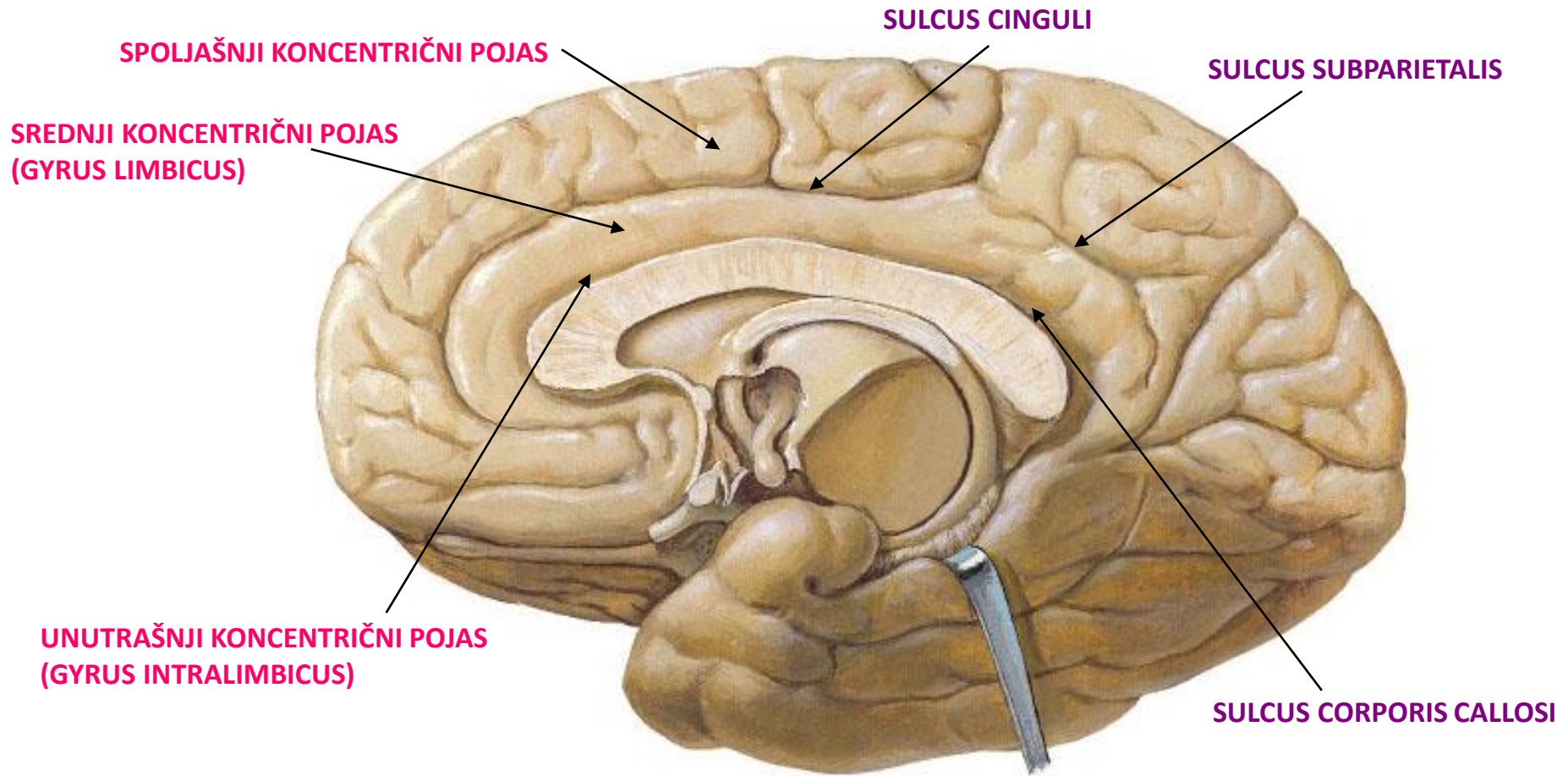
FACIES INFERIOR HEMISPHERII

LOBUS TEMPORALIS

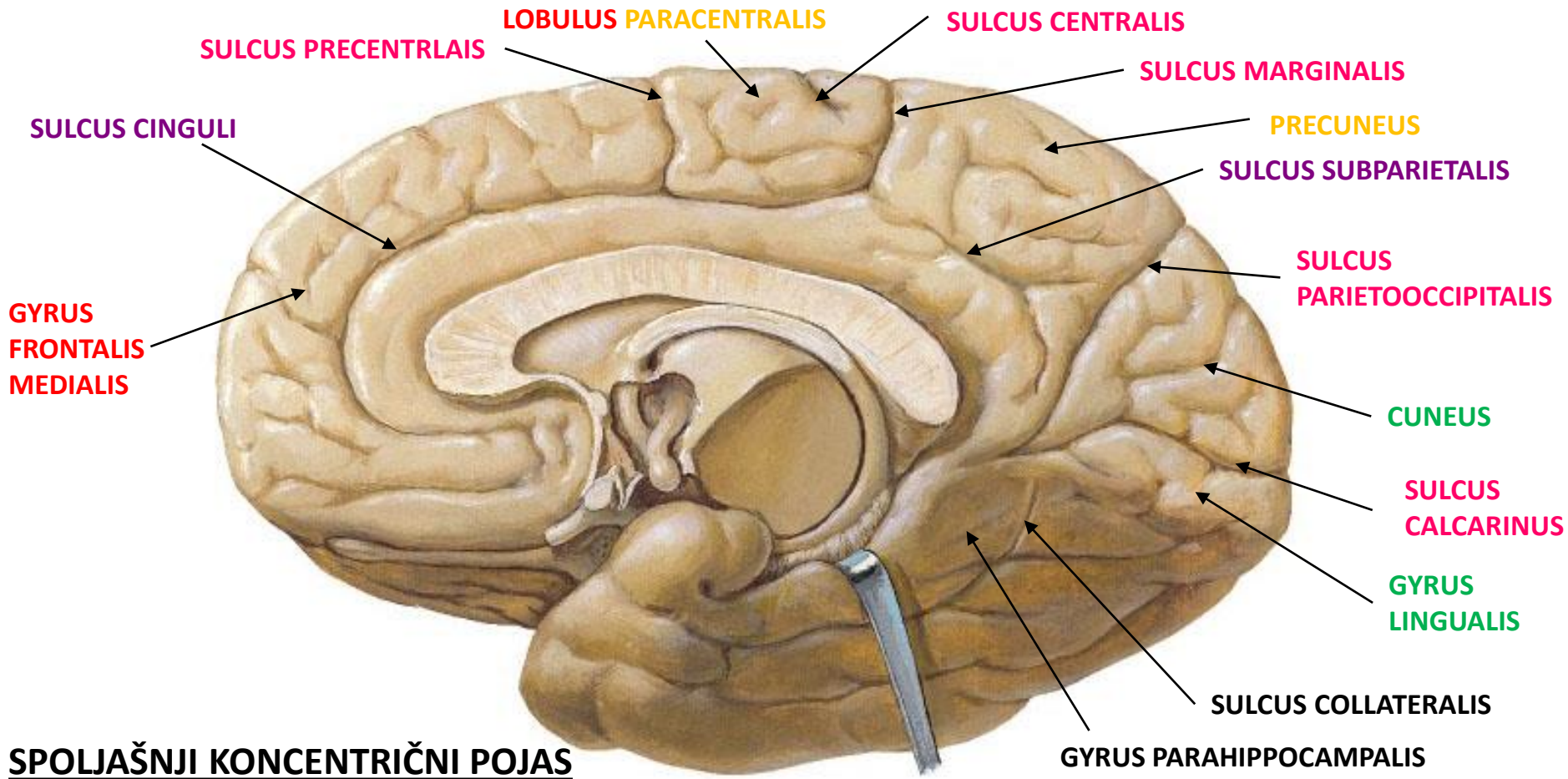
LOBUS OCCIPITALIS




FACIES MEDIALIS HEMISPHERII



FACIES MEDIALIS HEMISPHERII

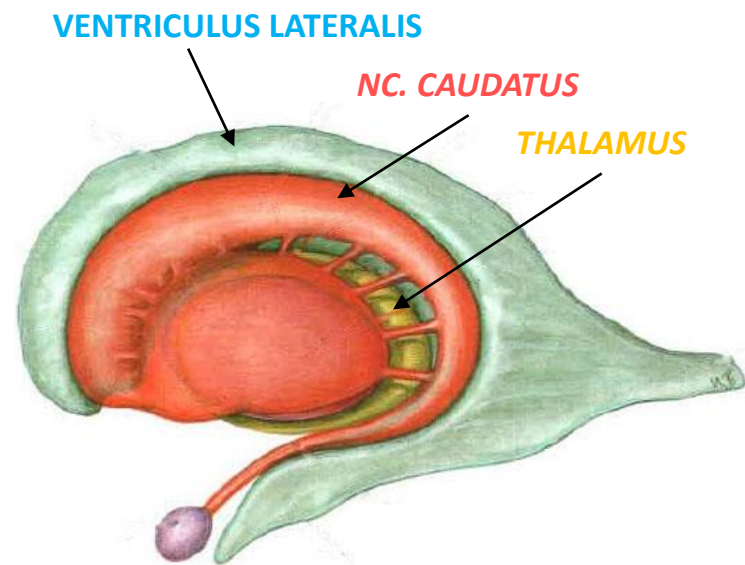
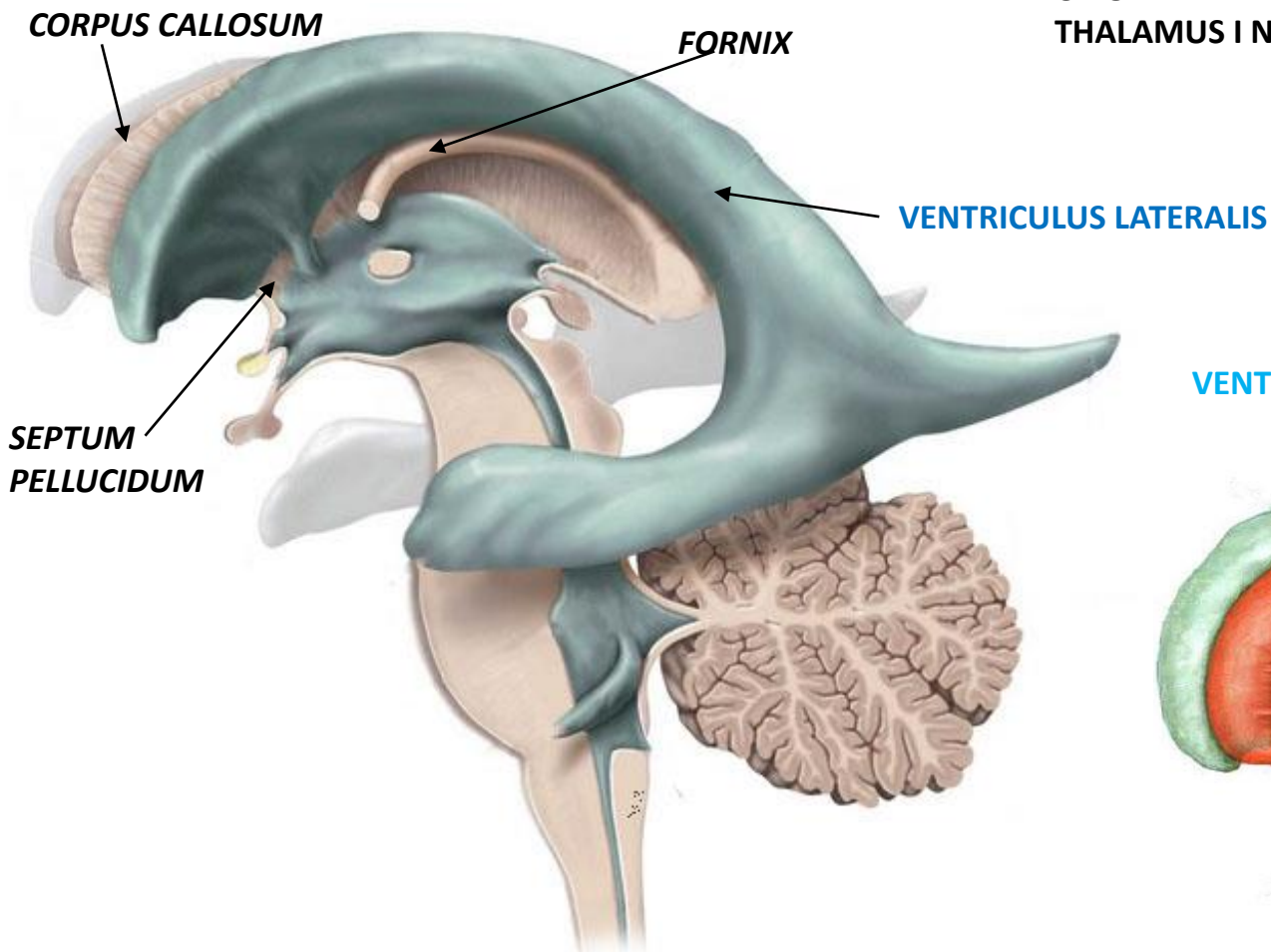


An anatomical illustration of the human spine and ribcage. The spine is shown in a light blue color, and the ribcage is shown in a darker blue color. A red highlight is placed on the thoracic region of the spine, indicating the location of the lateral ventricle.

**Ventriculus lateralis –
bočná moždana
komora**

VENTRICULUS LATERALIS

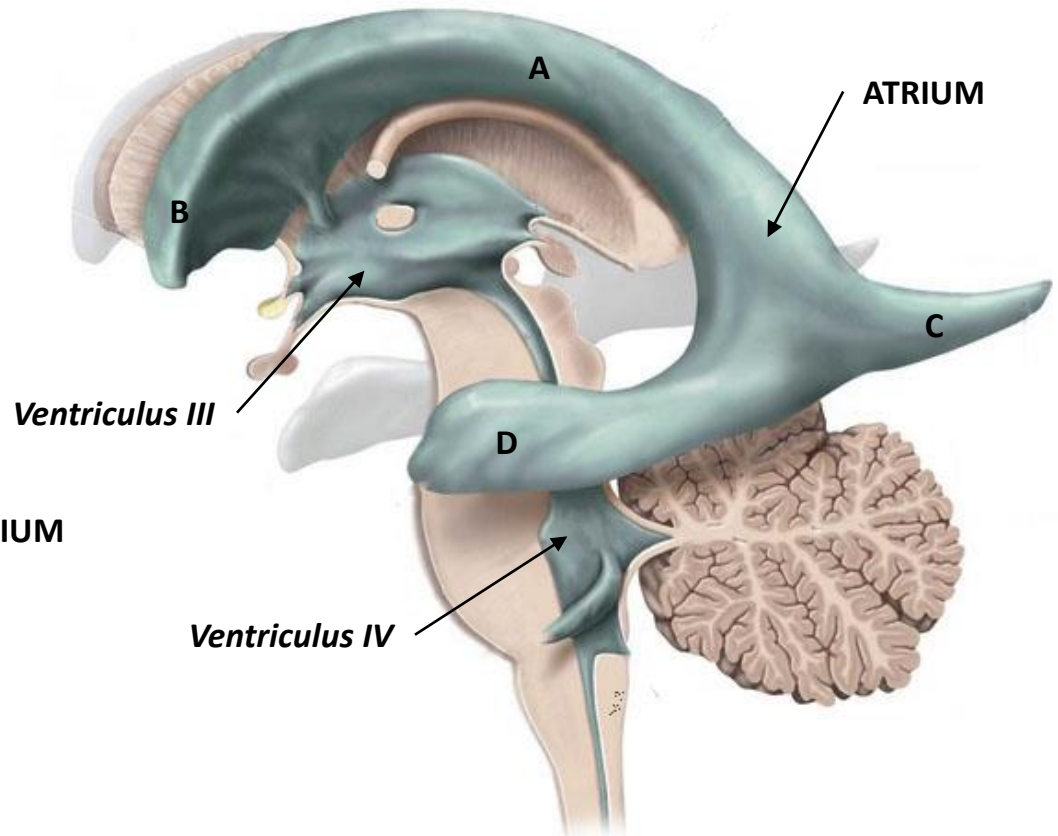
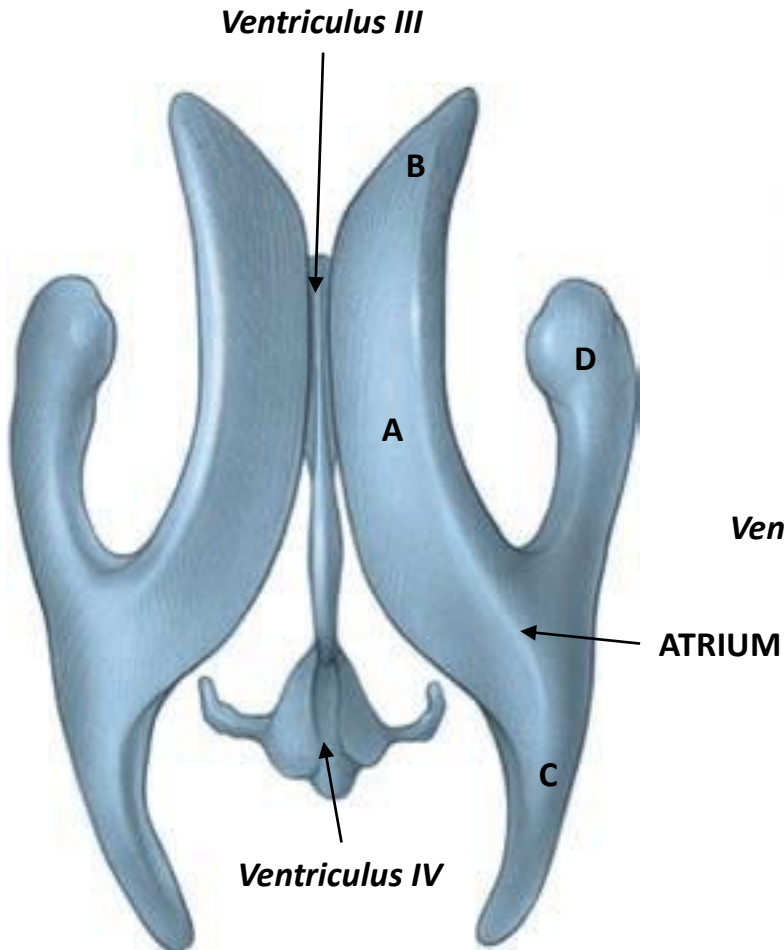
- CENTRALNA ŠUPLJINA HEMISFERE TELENCEPHALONA
- SMJEŠTENA ISPOD CORPUS CALLOSUM
- U KONKAVITETU BOČNE KOMORE NALAZE SE THALAMUS I NC. CAUDATUS



VENTRICULUS LATERALIS

DJELOVI:

- a) PARS CENTRALIS
- b) CORNU FRONTALE S. ANTERIUS
- c) CORNU OCCIPITALE S. POSTERIUS
- d) CORNU TEMPORALE S. INFERIUS

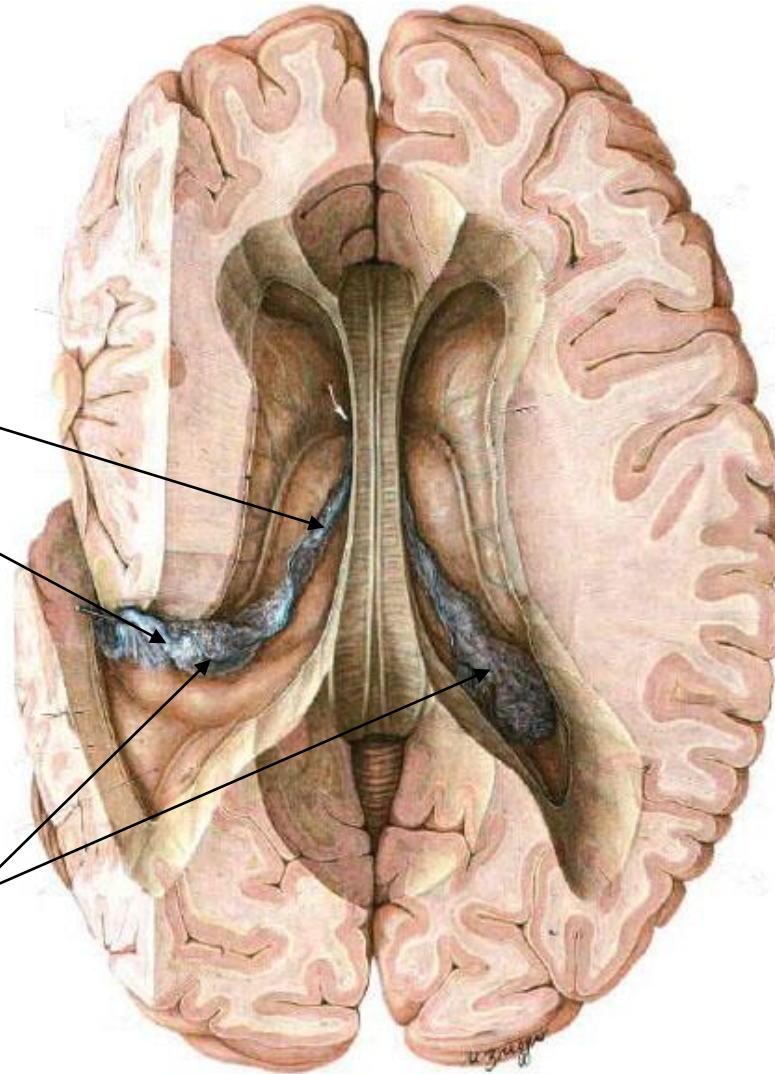


VENTRICULUS LATERALIS

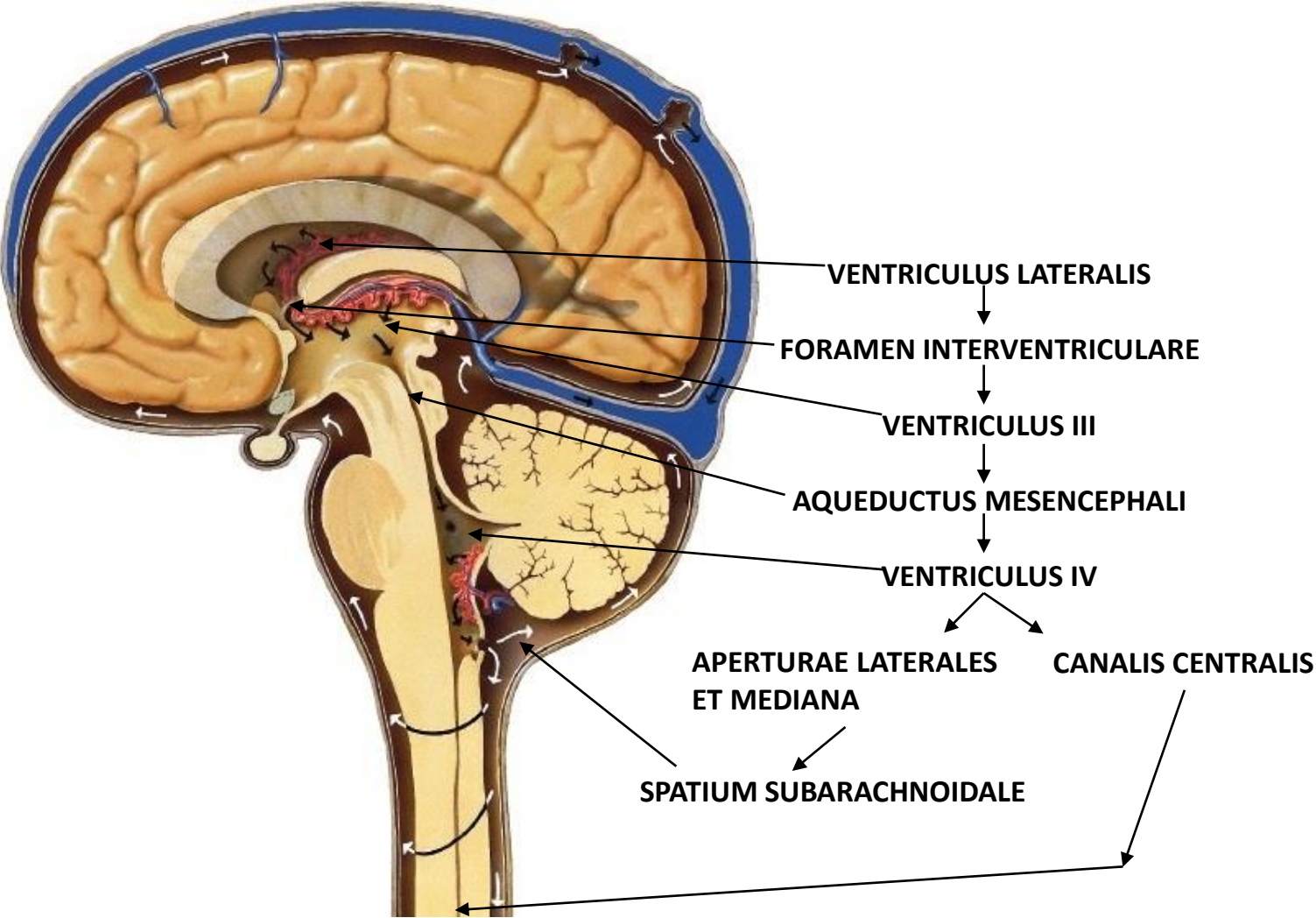
PLEXUS CHOROIDEUS

NALAZI SE U PARS
CENTRALIS I CORNU
TEMPORALE

NAJRAZVIJENIJI DIO U ATRIUMU I
NAZIVA SE GLOMUS CHOROIDEUM



PROTOK LIQUOR CEREBROSPINALIS



A 3D rendering of a human skeleton in a light blue color. The spine is highlighted in a reddish-pink color, indicating the focus of the image. The text "MORPHOLOGIA INTERNA" is overlaid in the center of the image.

MORPHOLOGIA INTERNA



- **SUBSTANTIA GRISEA**

- CORTEX CEREBRALIS
- NUCLEI BASALES
 - NC. CAUDATUS
 - NC. LENTIFORMIS
 - CLAUSTRUM
 - NC. AMYGDALOIDEUM (CORPUS)

- **SUBSTANTIA ALBA**

- NEUROFIBRAE ASSOCIATIONES
- NEUROFIBRAE COMMISSURALES
- NEUROFIBRAE PROJECTIONES
- GRUPISANE U:
 - CENTRUM SEMIOVALE
 - CAPSULA INTERNA
 - CAPSULA EXTERNA
 - CAPSULA EXTREMA

A 3D anatomical illustration of a human skeleton. The spine is highlighted in a reddish-pink color, while the rest of the skeleton is rendered in a translucent blue. The text 'SUBSTANTIA GRISEA' is overlaid in white, bold, sans-serif font across the middle of the spine.

SUBSTANTIA GRISEA



Cortex cerebri

CORTEX CEREBRALIS

LAMINARNA ORGANIZACIJA

LAMINA MOLECULARIS

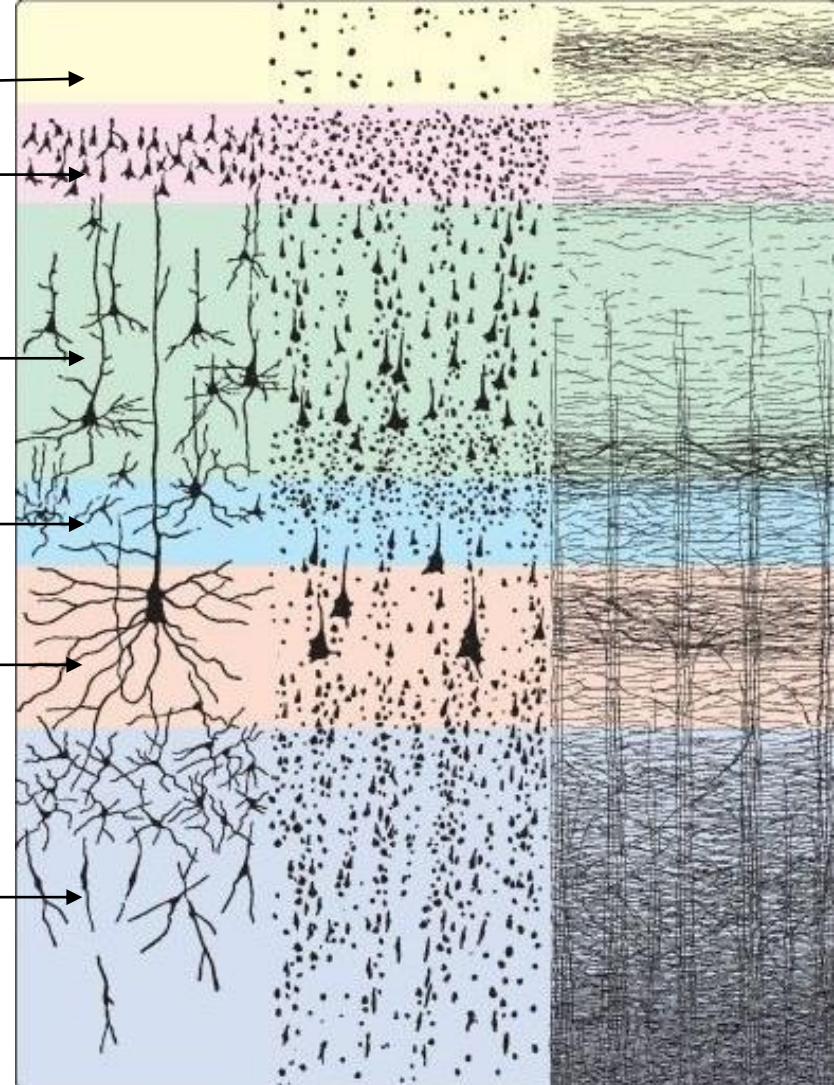
LAMINA GRANULARIS
EXTERNA

LAMINA PYRAMIDALIS
EXTERNA

LAMINA GRANULARIS
INTERNA

LAMINA PYRAMIDALIS
INTERNA

LAMINA MULTIFORMIS



- 14 milijardi neurona
- Debljina kore 2-4 mm
- Površina 2200 cm²
- 47,5% težine mozga

ISOCORTEX (NEOCORTEX) 90%

- ISOCORTEX HOMOGENETICUS
- ISOCORTEX HETEROGENETICUS
- GRANULARNA KORA
- AGRANULARNA KORA

ALLOCORTEX 10%

- ARCHICORTEX
 - Lamina molecularis
 - Lamina pyramidalis
 - Lamina multiformis
- PALEOCORTEX
- MESOCORTEX

TIPOVI NEURONA

H – neuron horizontale

P – neuron pyramidale 66%

1. parvum

2. medium

3. magnum – Betz-ov neuron

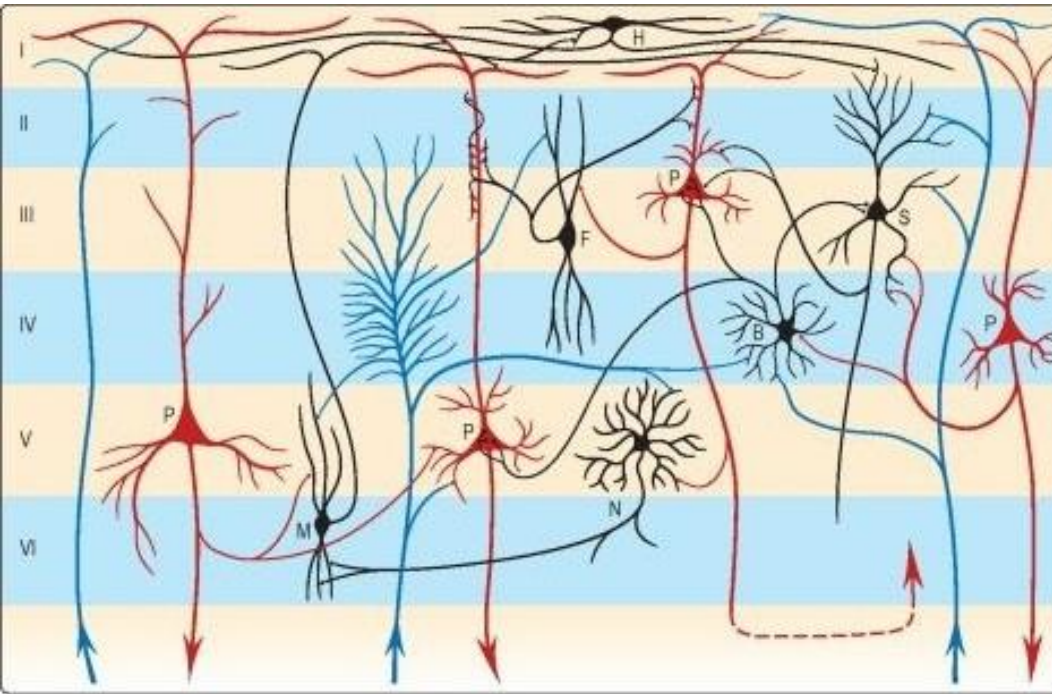
M – Martinotijev neuron

B - „bascet“ neuron

S – neuron stellatum

F – neuron fusiforme

N – neuroglijaformni neuron



INTRAKORTIKALNE VEZE

- ASOCIJACIONE (ipsilateralne)
- KOMISURALNE (kontralateralne)

AFERENTNA VLAKNA

- RADIATIO THALAMI iz jedara talamusa
 - SPECIFIČNA
 - NESPECIFIČNA
- moždanog stabla
- hypothalamusa
- claustruma
- bazalnog telencephalona

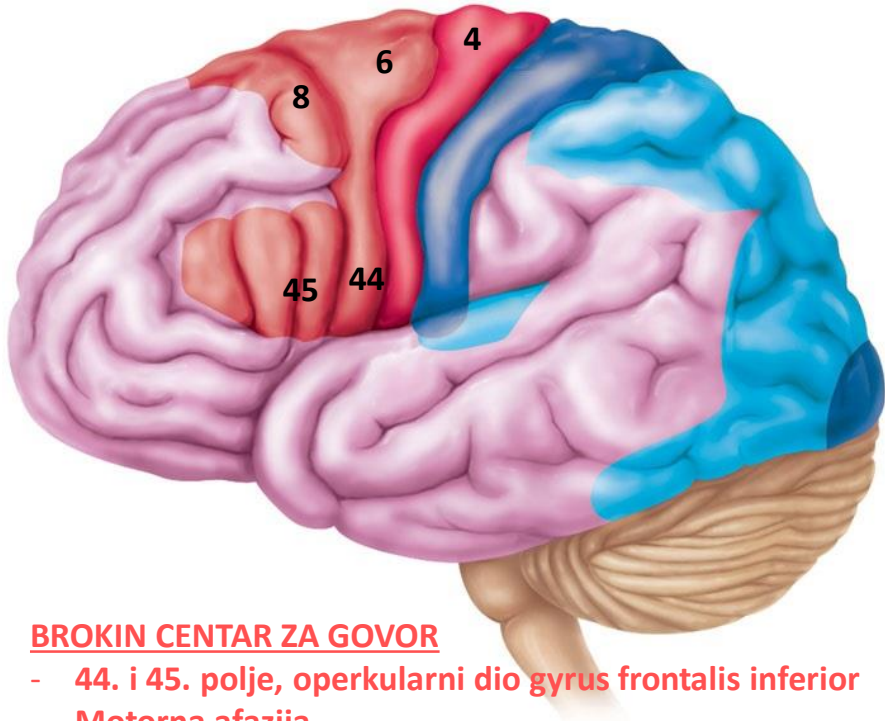
EFERENTNA VLAKNA

- Aksoni piramidalnih ćelija

CITOARHITEKTONSKE I FUNKCIONALNE ZONE KORE

- 52 BRODMANNOVA POLJA
- PRIBLIŽNO ODGOVARAJU FUNKCIONALNIM ZONAMA KORE
- FUNKCIONALNA PODJELA KORE:
 - PRIMARNA KORTIKALNA POLJA
 - MOTORNA
 - SENZORNA (SENZITIVNA I SENZORIJELNA)
 - SEKUNDARNA POLJA
 - MOTORNA
 - SENZORNA
 - TERCIJARNA POLJA – ASOCIJATIVNE ZONE
 - PREFRONTALNA KORA
 - PARIJETO-TEMPORO-OKCIPITALNA KORA
 - LIMBIČKA KORA
- LATERALIZACIJA FUNKCIJA – DOMINANTNA HEMISFERA

MOTORNI KORTIKALNI CENTRI



BROKIN CENTAR ZA GOVOR

- 44. i 45. polje, operkularni dio gyrus frontalis inferior
- Motorna afazija

FRONTALNO VIDNO POLJE

- 8. polje, zadnji dio gyrus frontalis medius, Mm. bulbi

CENTAR ZA PISANJE RUKOM

- Gyrus frontalis medius

PRIMARNO MOTORNO POLJE

- 4. polje po Brodmann-u
- Gyrus precentralis + 2/3 lobulus paracentralis

SEKUNDARNO MOTORNO POLJE

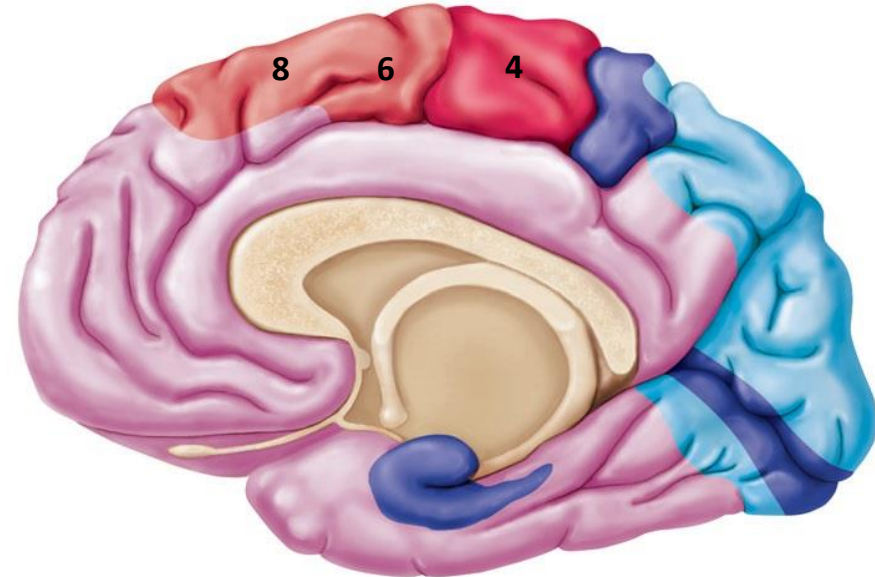
- 6. i 8. polje po Brodmann-u
- Prednji dio gyrus precentralis + zadnji djelovi gyrus frontalis superior, medius et inferior

SUPLEMENTARNO MOTORNO POLJE

- Zadnji dio gyrus frontalis medialis

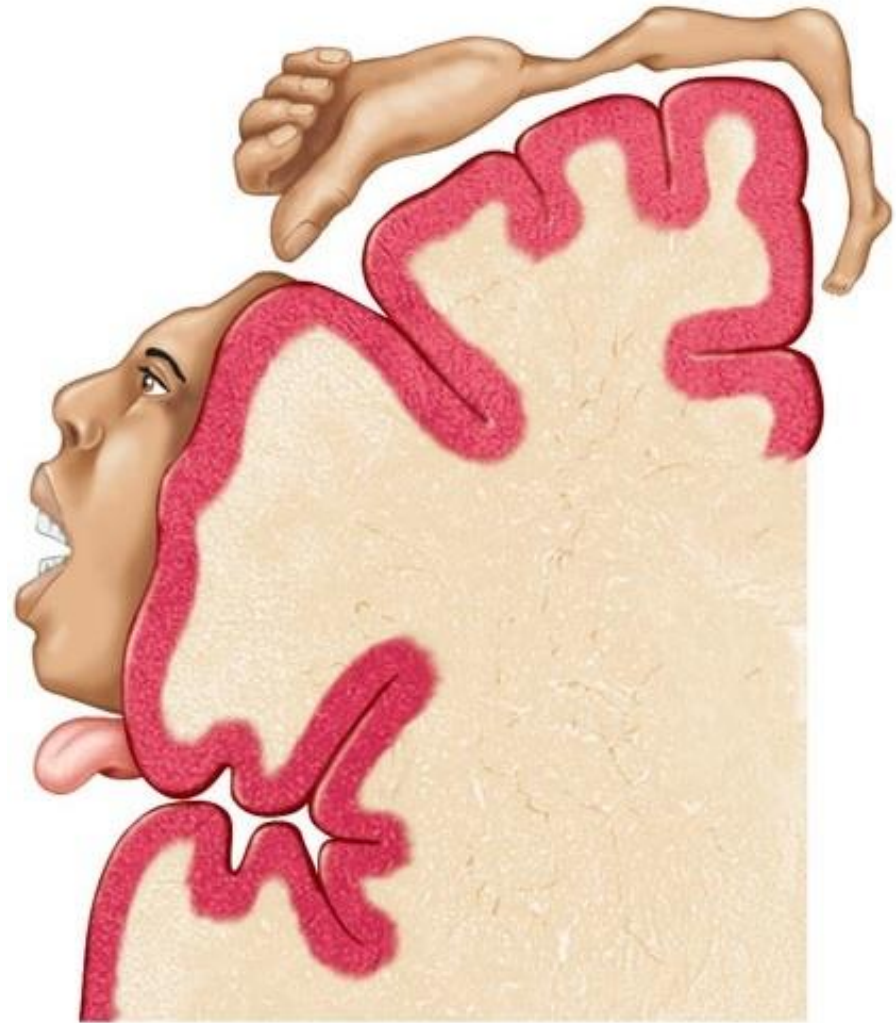
ASOCIJATIVNO MOTORNO POLJE

- Prefrontalna kora

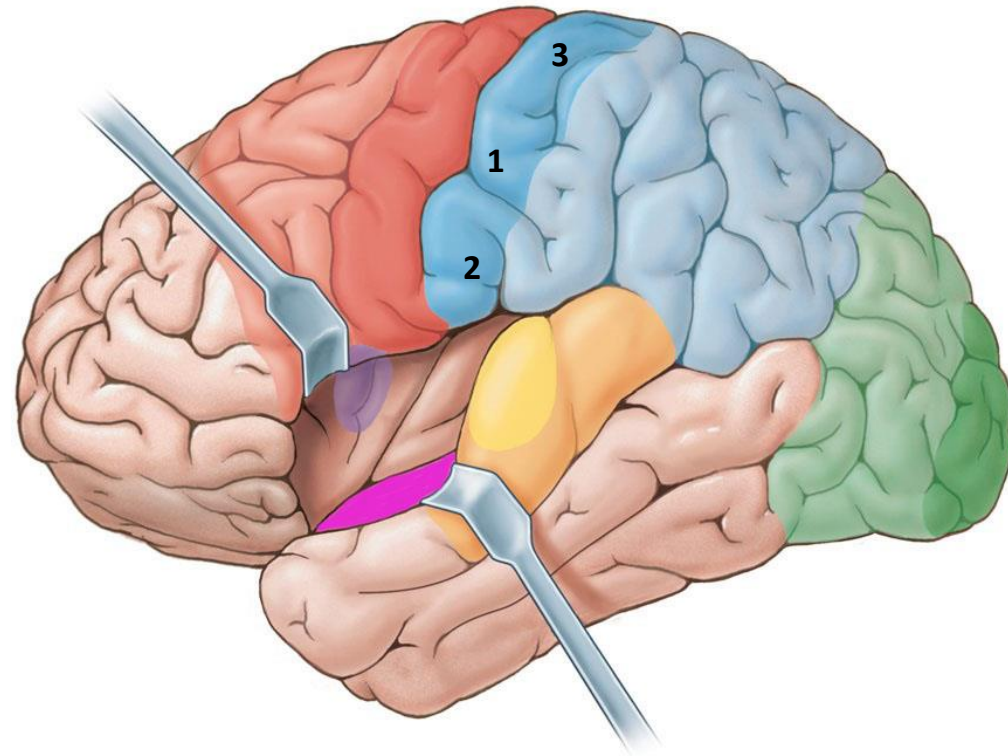


MOTORNI KORTIKALNI CENTRI

MOTORNI HOMUNCULUS



SENZORNI KORTIKALNI CENTRI

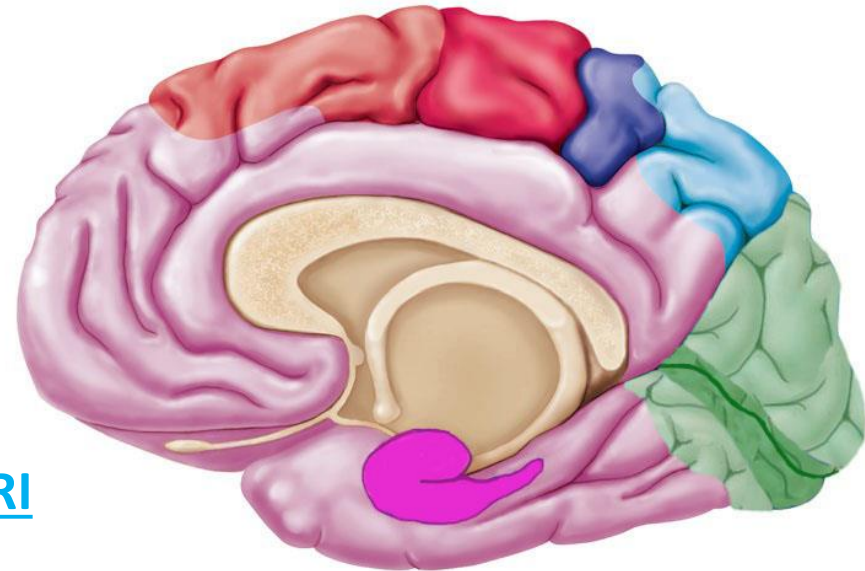


SOMATOSENZITVNI KORTIKALNI CENTRI

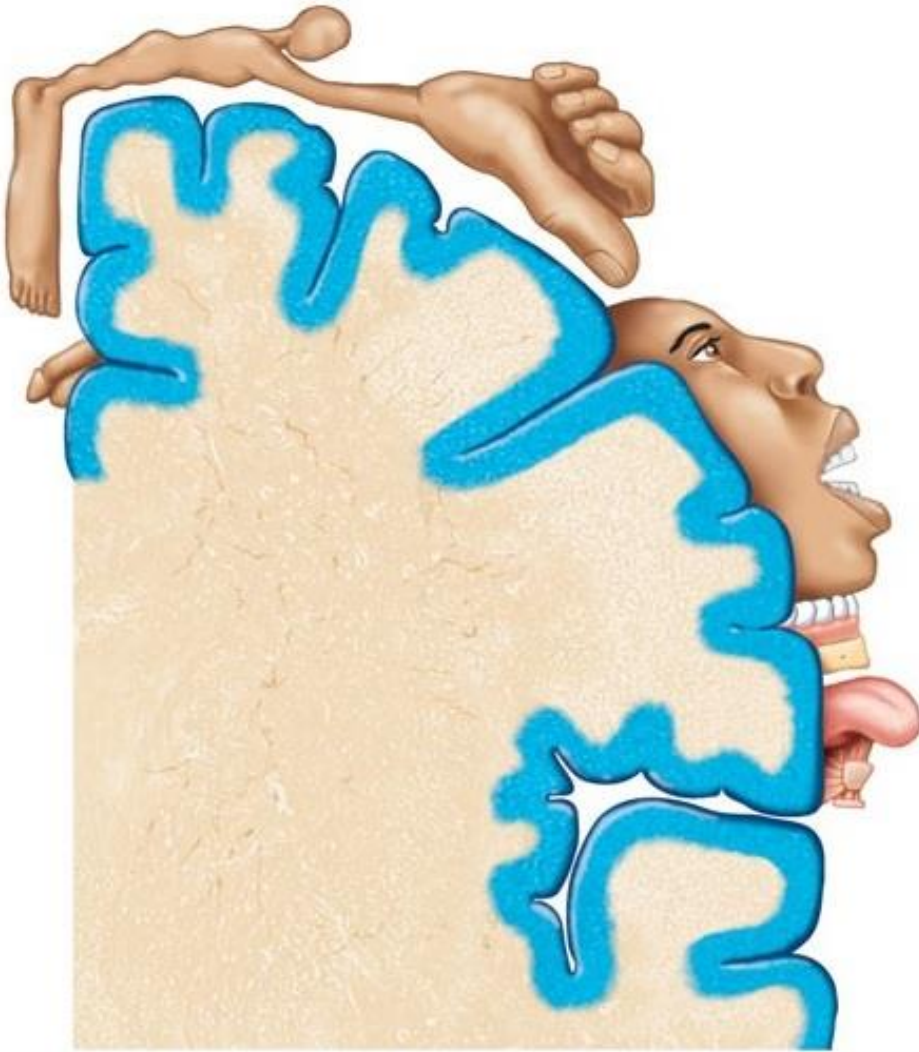
PRIMARNO SOMATOSENZITIVNO POLJE

- 1., 2. i 3. polje po Brodmann-u
- Gyrus postcentralis + zadnja 1/3 lobulus paracentralis

SEKUNDARNO SOMATOSENZITIVNO POLJE

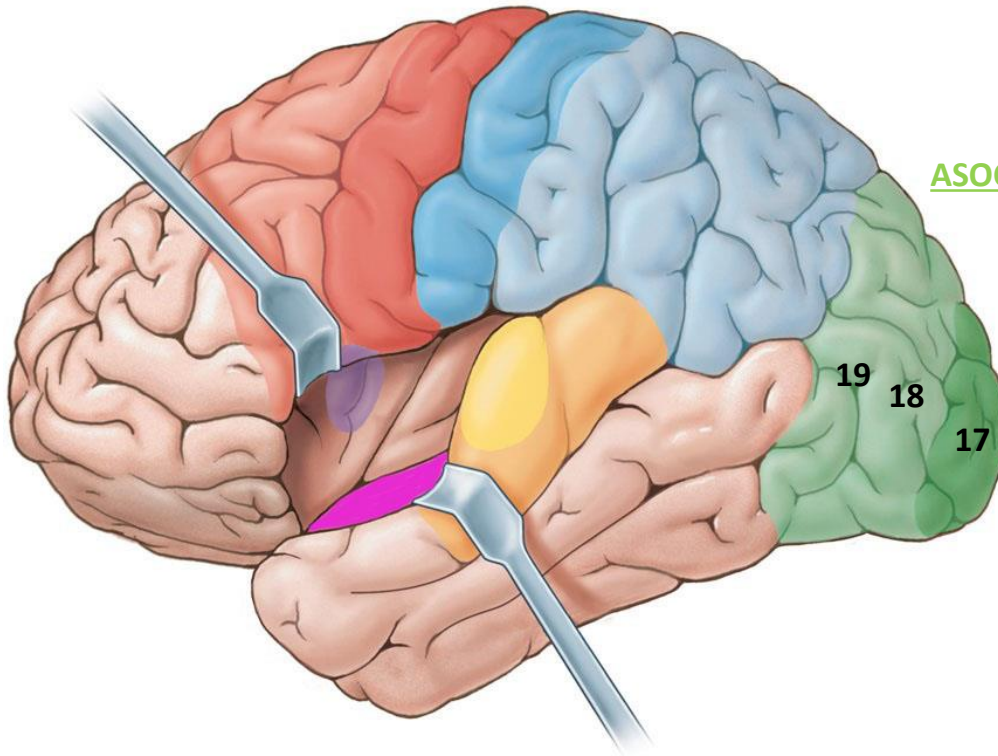


SOMATOSENZITVNI KORTIKALNI CENTRI



SENZORNI HOMUNCULUS

SENZORNI KORTIKALNI CENTRI



OPTIČKI KORTIKALNI CENTRI

ASOCIJACIONO POLJE

PRIMARNO VIDNO POLJE – AREA STRIATA

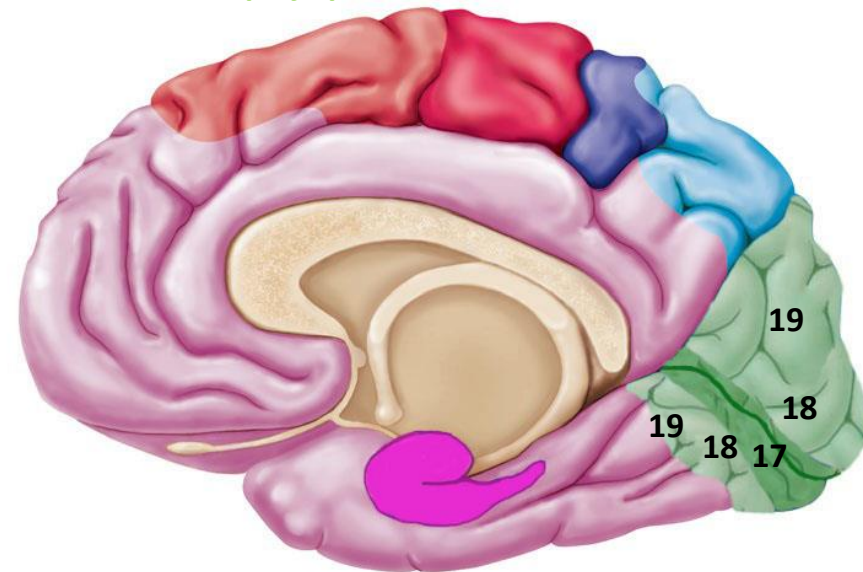
- 17. polje po Brodmann-u
- Gornja i donja usna sulcus calcarinusa, dio cuneusa i gyrus lingualisa

SEKUNDARNO VIDNO POLJE – AREA PERISTRIATA

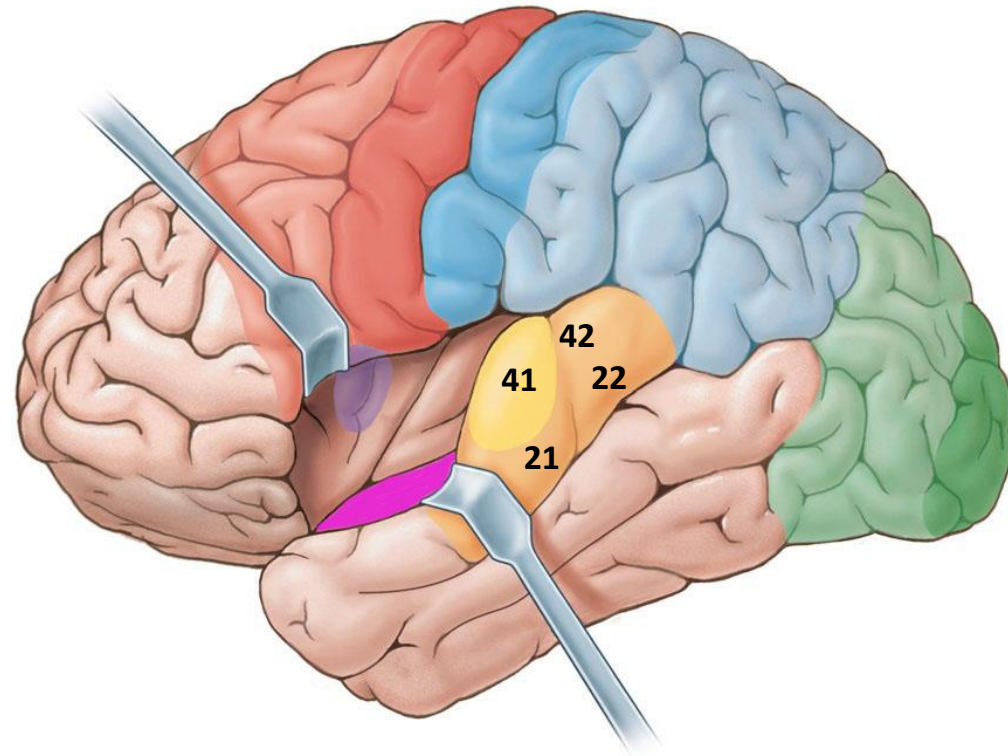
- 18. polje po Brodmann-u

TERCIJARNO VIDNO POLJE – AREA PARASTRIATA

- 19. polje po Brodmann-u



SENZORNI KORTIKALNI CENTRI



AKUSTIČKI KORTIKALNI CENTRI

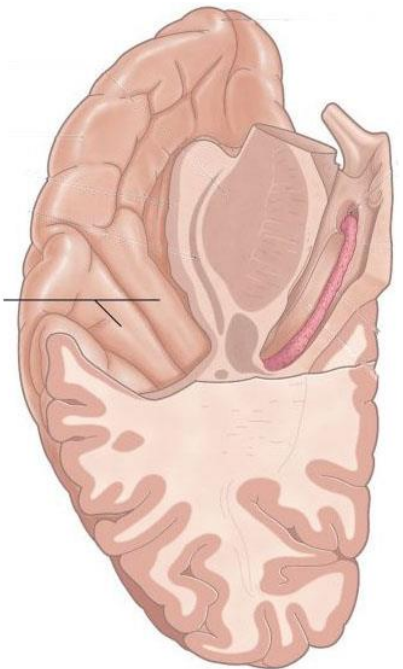
PRIMARNO AKUSTIČKO POLJE

- 41. polje po Brodmann-u
- Pars opercularis gyrus temporalis superior, gyri temporales transversi Heschl

SEKUNDARNO AKUSTIČKO POLJE

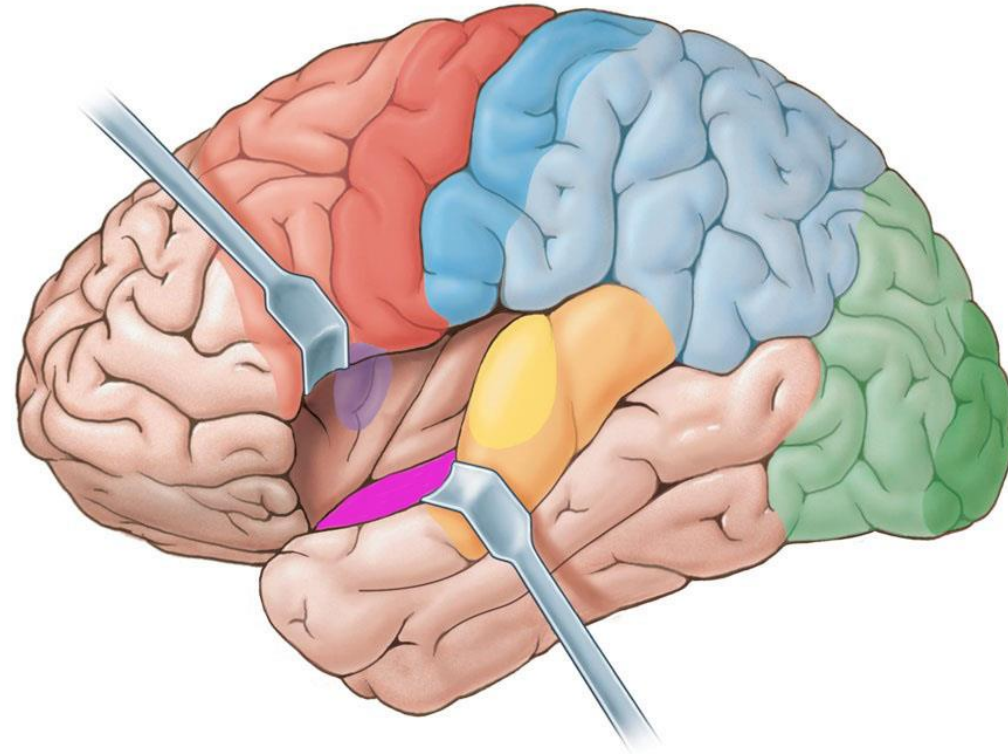
- 21., 22. i 42. polje po Brodmanu
- Zadnji dio gyrus temporalis superior

Gyri temporales transversi



Gornja strana gyrus temporalis superior nakon uklanjanja dijela frontalnog i parijetalnog režnja

SENZORNI KORTIKALNI CENTRI

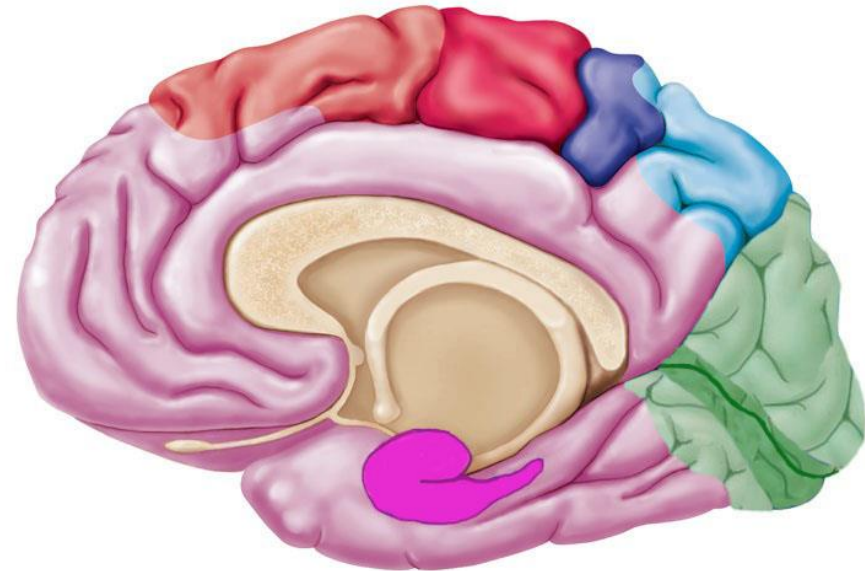


GUSTATIVNI KORTIKALNI CENTAR

- 43. polje po Brodmann-u

OLFAKTIVNI KORTIKALNI CENTAR

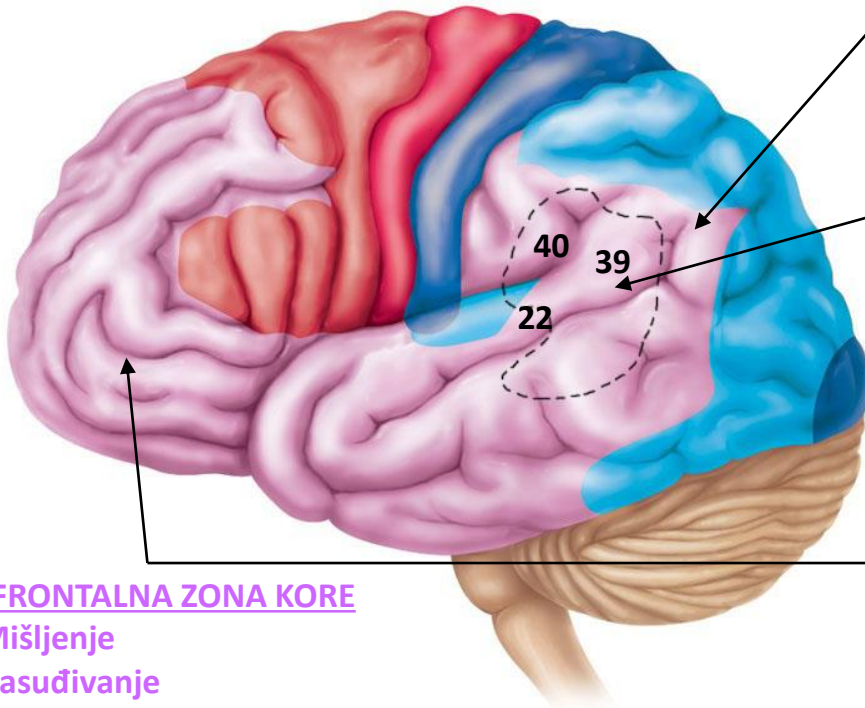
- U gyrus parahippocampalis: Area prepiriformis, area periamygdalaris et area entorhinalis



TERCIJARNE ZONE

PARIJETO-TEMPORO-OKCIPITALNA ZONA KORE

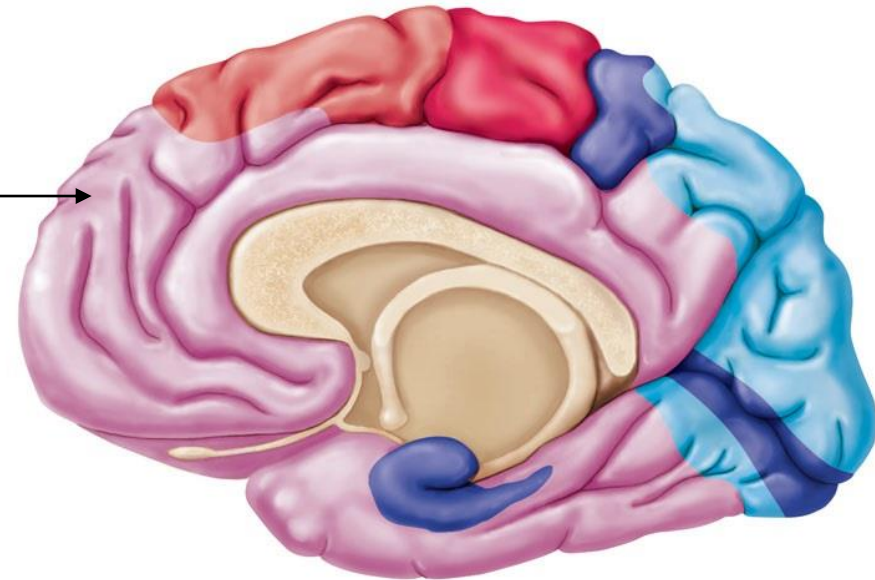
- Sakuplja impulse iz somatosenzitivne, auditivne i vizuelne kore
- Apstraktno mišljenje
- Za razumjevanje značenja, složenih matematičkih i logičkih struktura i sistema brojeva
- Wernickeovo polje – senzorni centar za govor, (senzorna afazija), važan za proces govora, čitanja, pisanja (razumjevanje pročitano i napisanog)



PREFRONTALNA ZONA KORE

- Mišljenje
- Rasuđivanje
- Planiranje
- Pamćenje
- Razumjevanje
- Emocije
- Motivacija
- Ponašanje

LIMBIČKA ZONA KORE



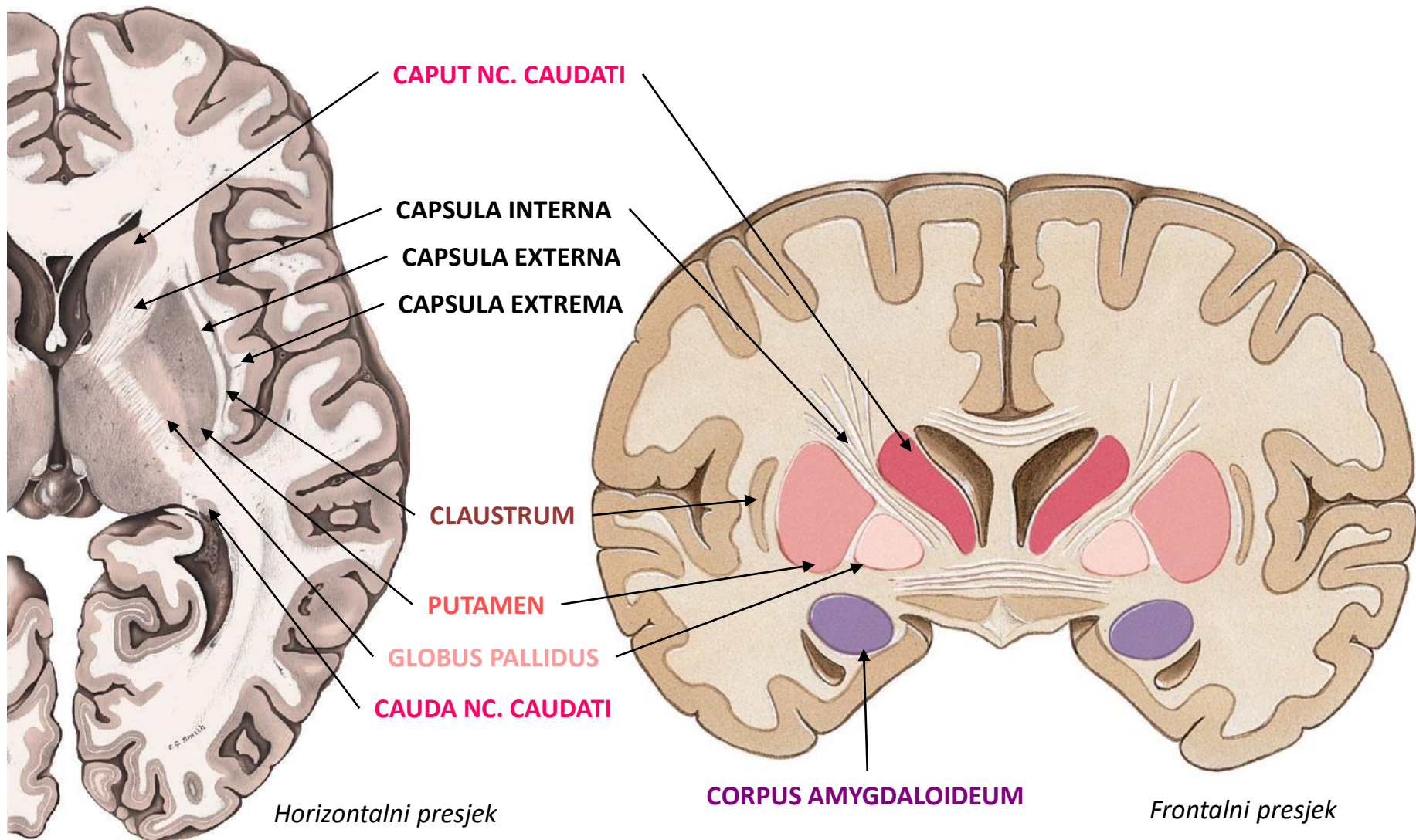


Nuclei basales

NUCLEI BASALES

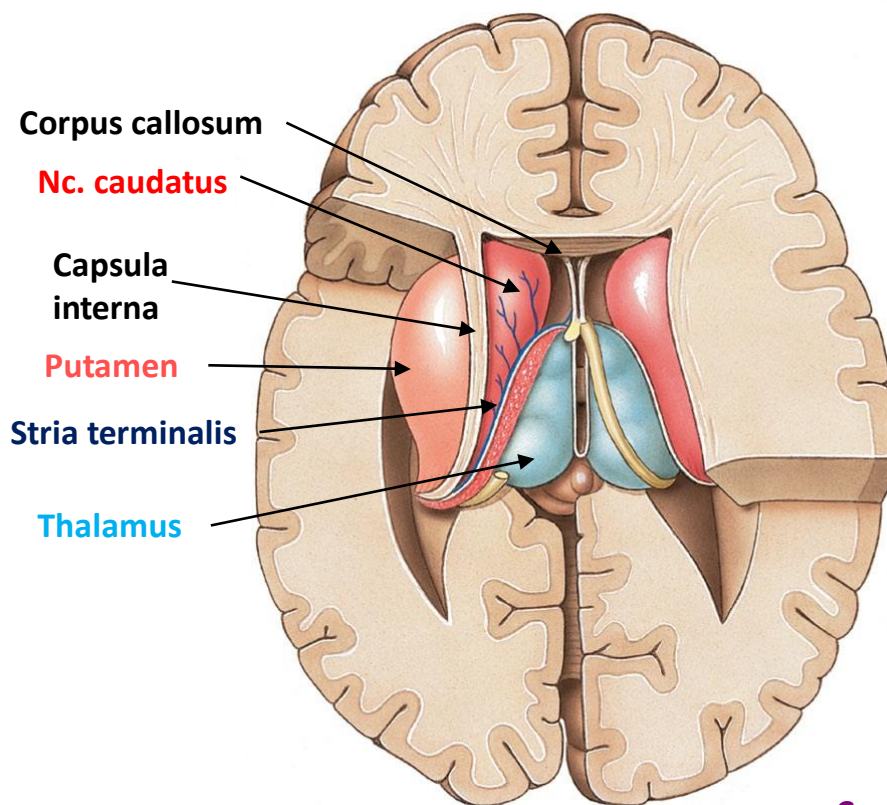


- **CORPUS STRIATUM**
 - **NUCLEUS CAUDATUS**
 - **NUCLEUS LENTIFORMIS**
 - **PUTAMEN**
 - **GLOBUS PALLIDUS**
- **CLAUSTRUM**
- **CORPUS AMYGDALOIDEUM**

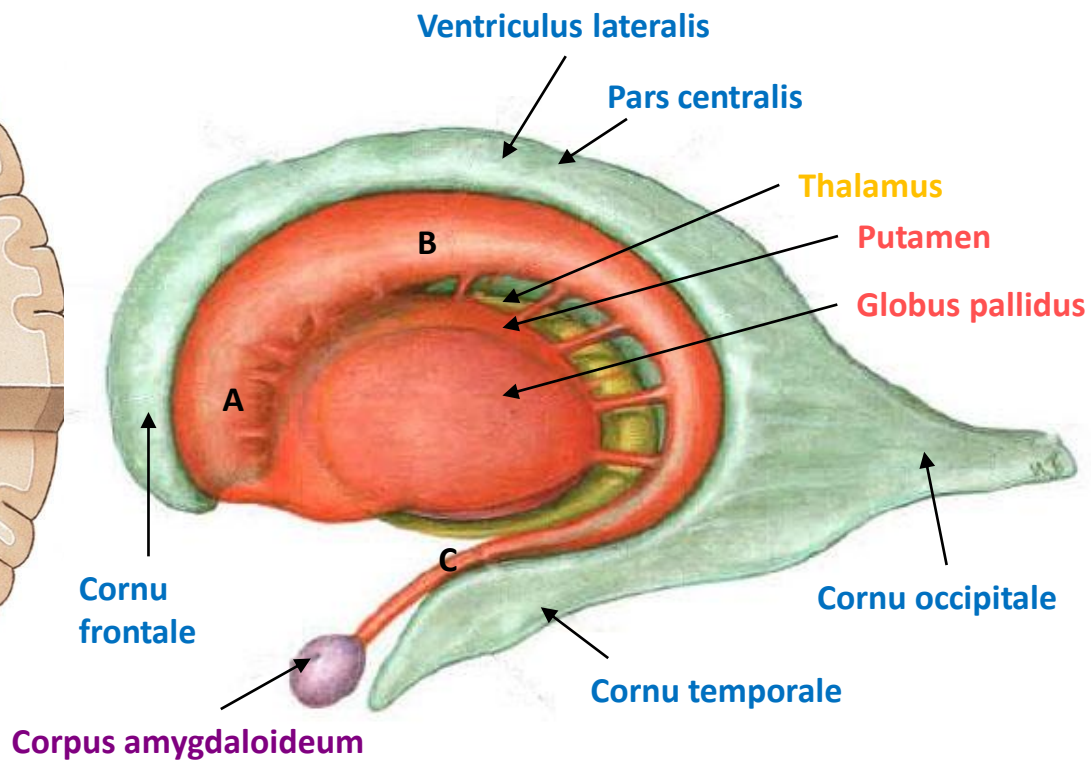


NC. CAUDATUS – repato jedro

- A) CAPUT
- B) CORPUS
- C) CAUDA



Horizontalni presjek



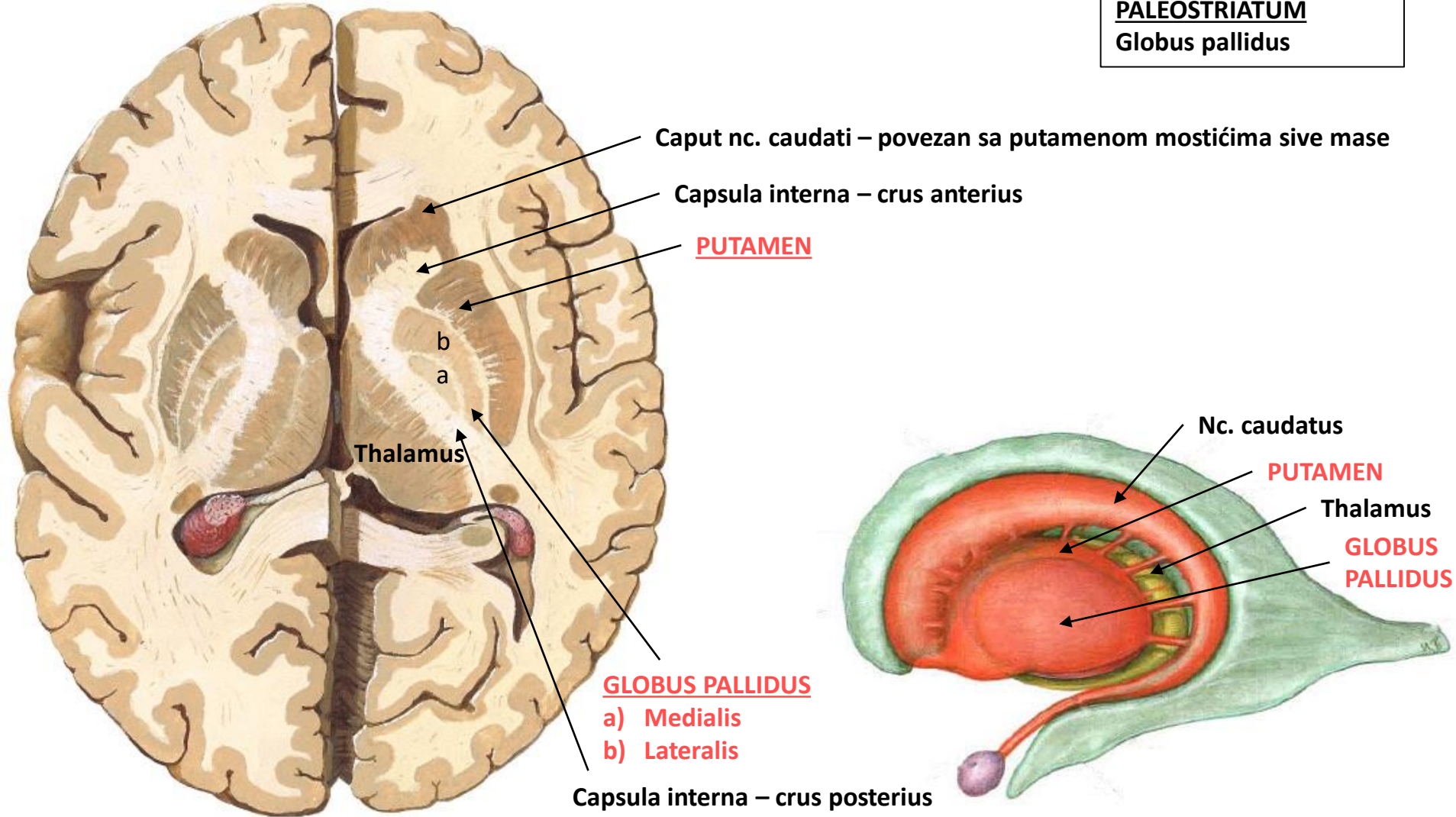
NC. LENTIFORMIS – sočivasto jedro

NEOSTRIATUM

Putamen + nc. caudatus

PALEOSTRIATUM

Globus pallidus



Horizontalni presjek



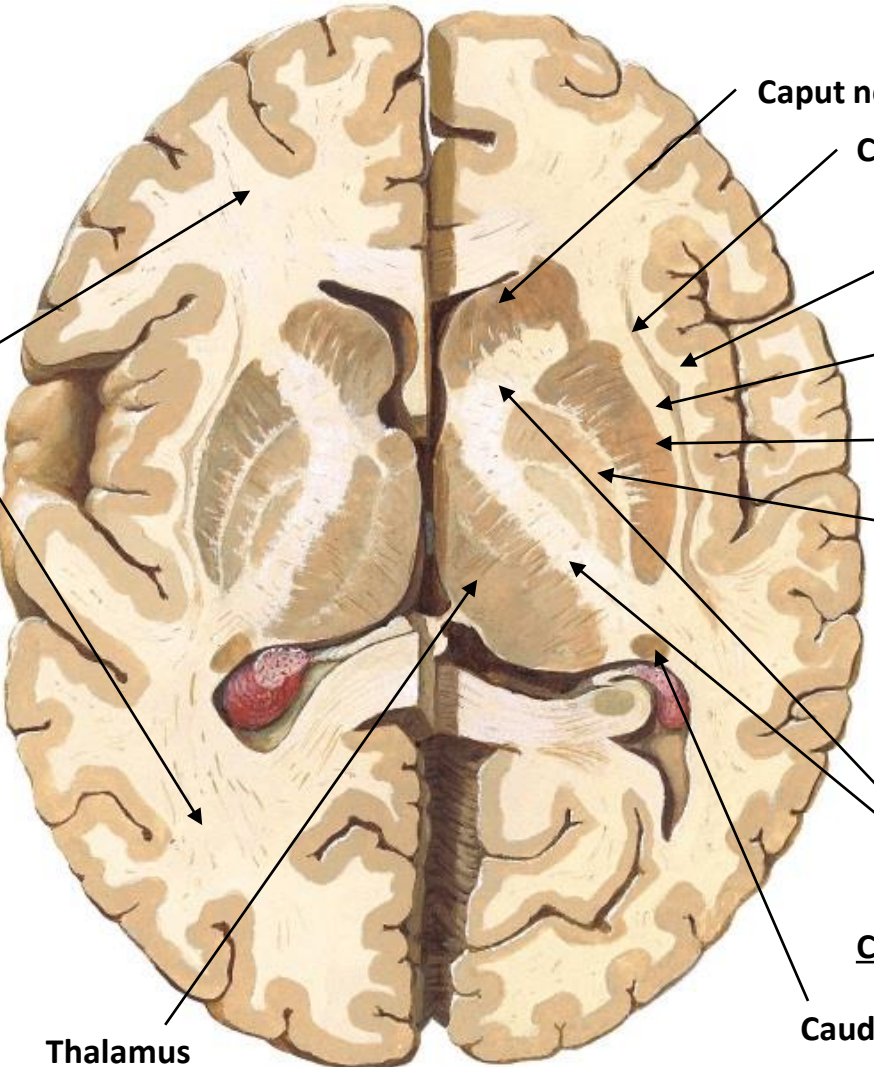
SUBSTANTIA ALBA

ASOCIJACIONA VLAKNA
KOMISURALNA VLAKNA
PROJEKCIJNA VLAKNA

CENTRUM SEMIOVALE

CORONA RADIATA:

- Pars frontalis
- Pars parietalis
- Pars temporalis
- Pars occipitalis



Caput nc. caudati

Clastrum

CAPSULA EXTREMA

CAPSULA EXTERNA

Putamen

Globus pallidus

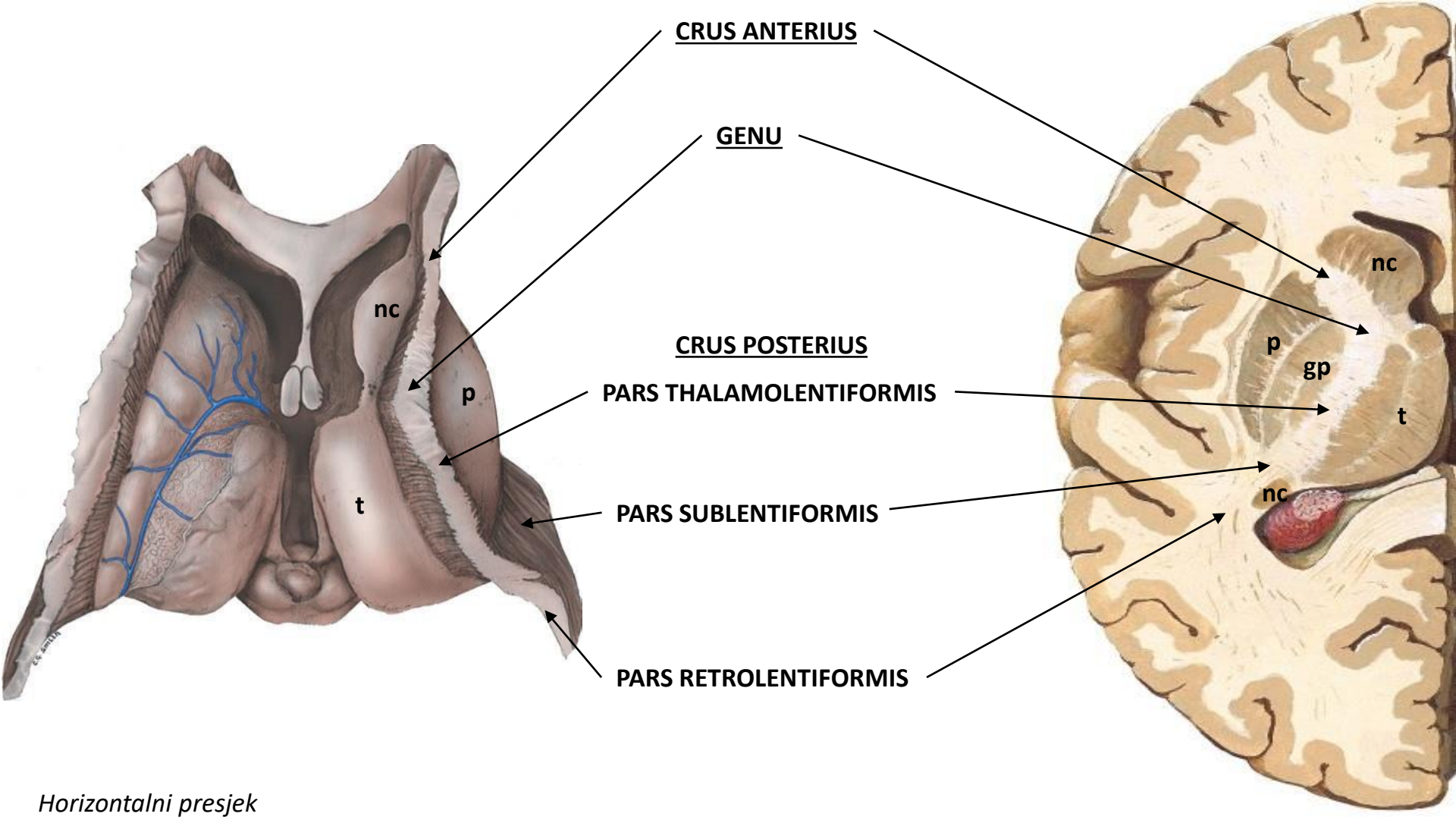
CAPSULA INTERNA

Cauda nc. caudati

Thalamus

Horizontalni presjek

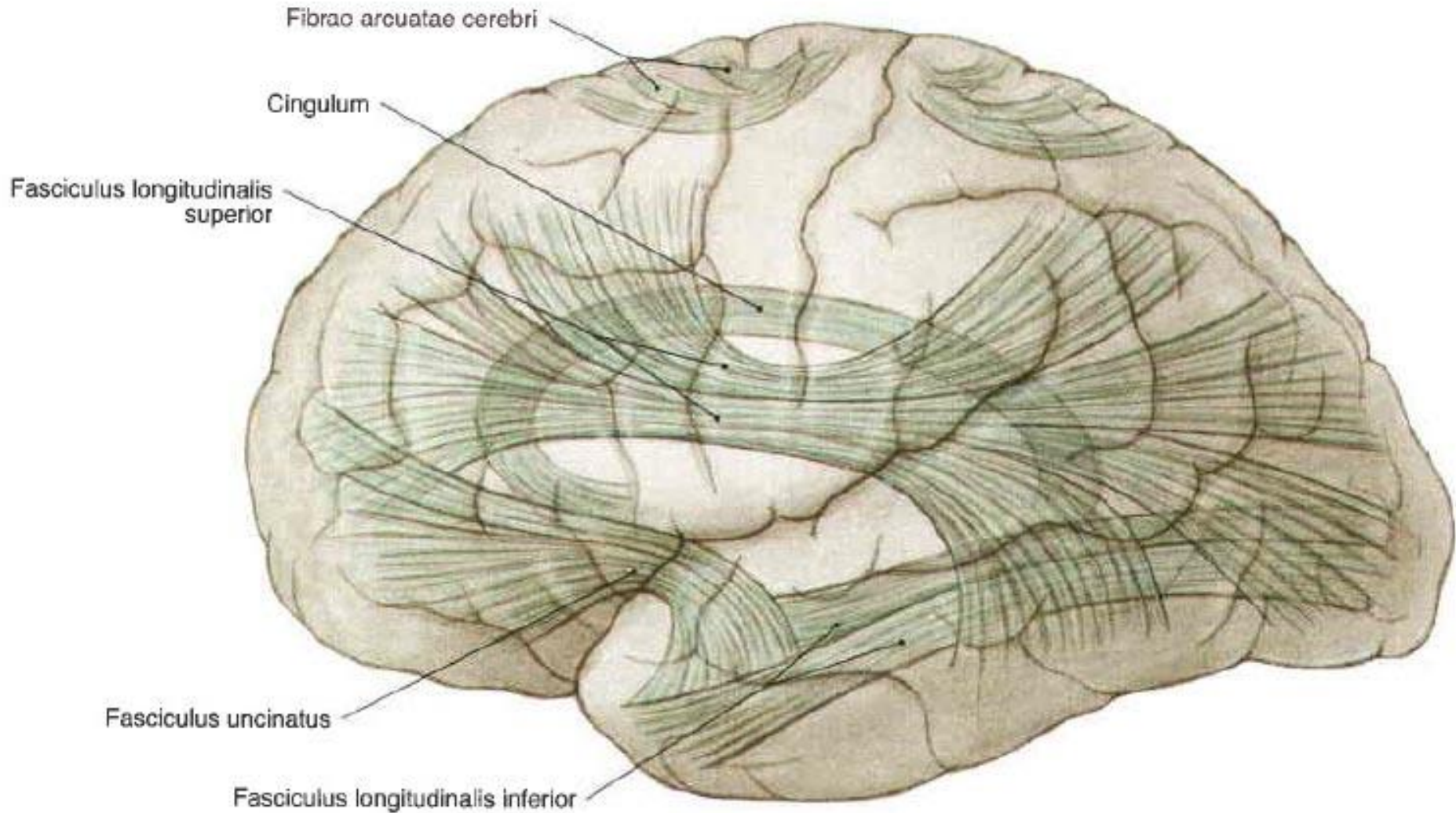
CAPSULA INTERNA



Horizontalni presjek

Horizontalni presjek

ASOCIJACIONA VLAKNA – FIBRAE ASSOCIATIONES CEREBRI

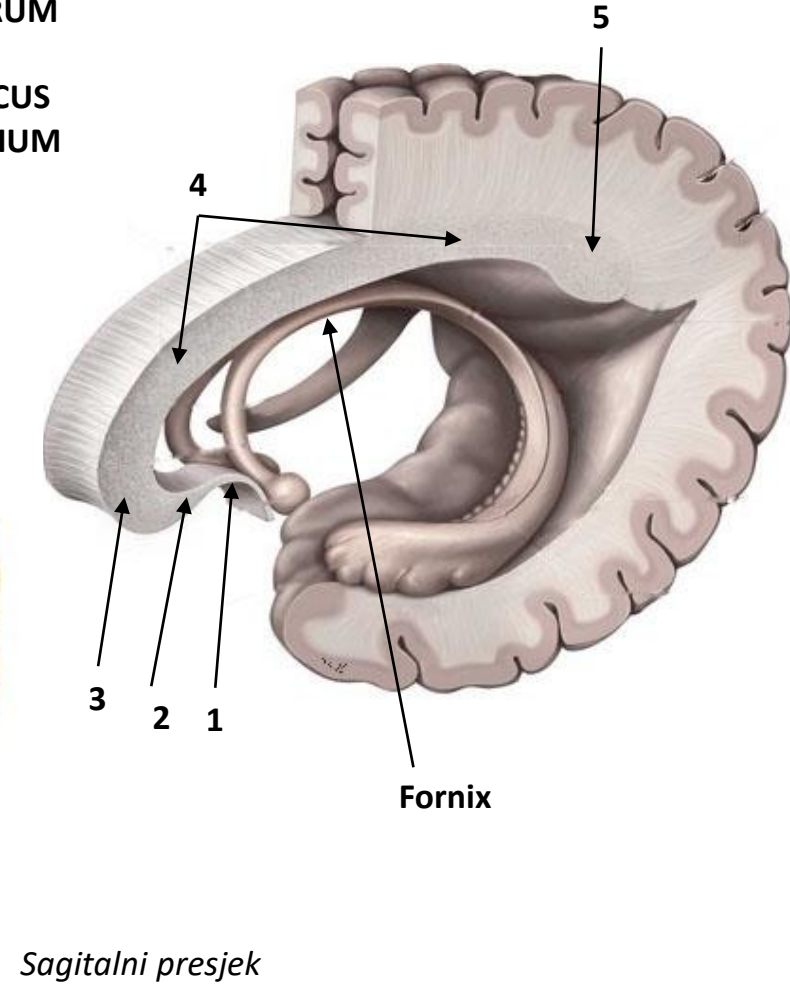
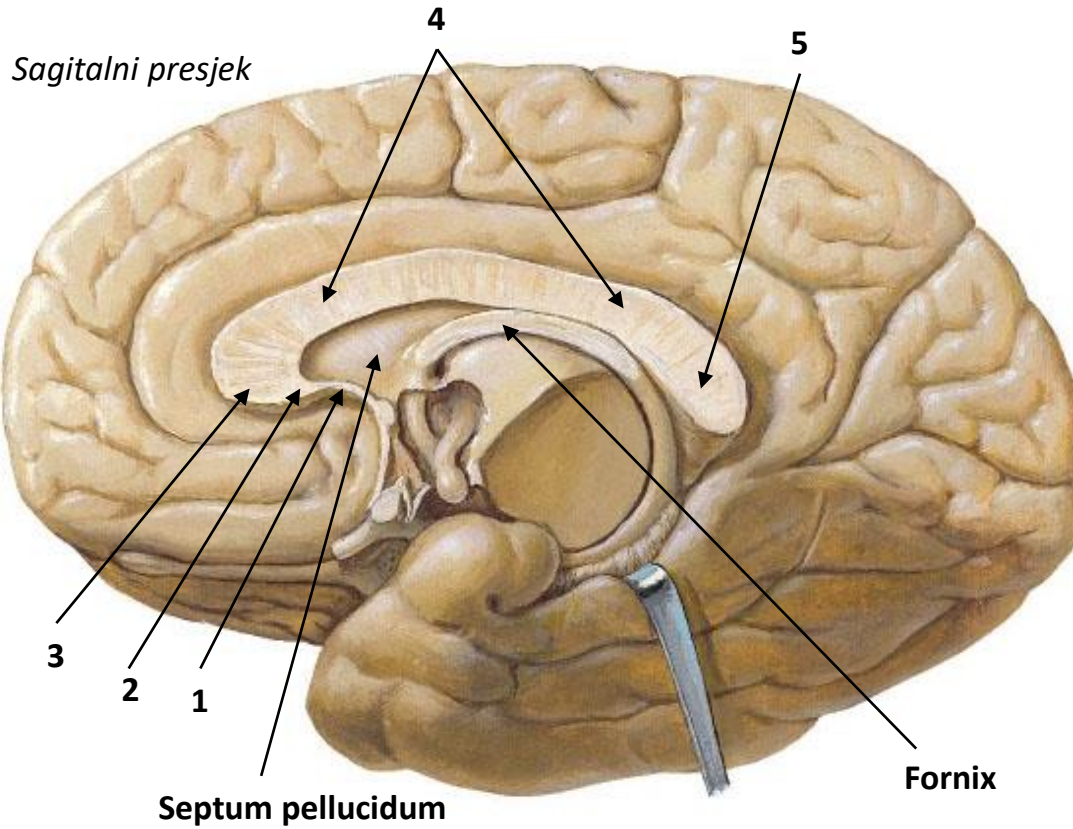


KOMISURALNA VLAKNA – COMMISSURAE TELENCEPHALI

- CORPUS CALLOSUM
- COMMISURA CEREBRI ANTERIOR
- FORNIX (COMMISSURA FORNICIS)
- SEPTUM PELLUCIDUM

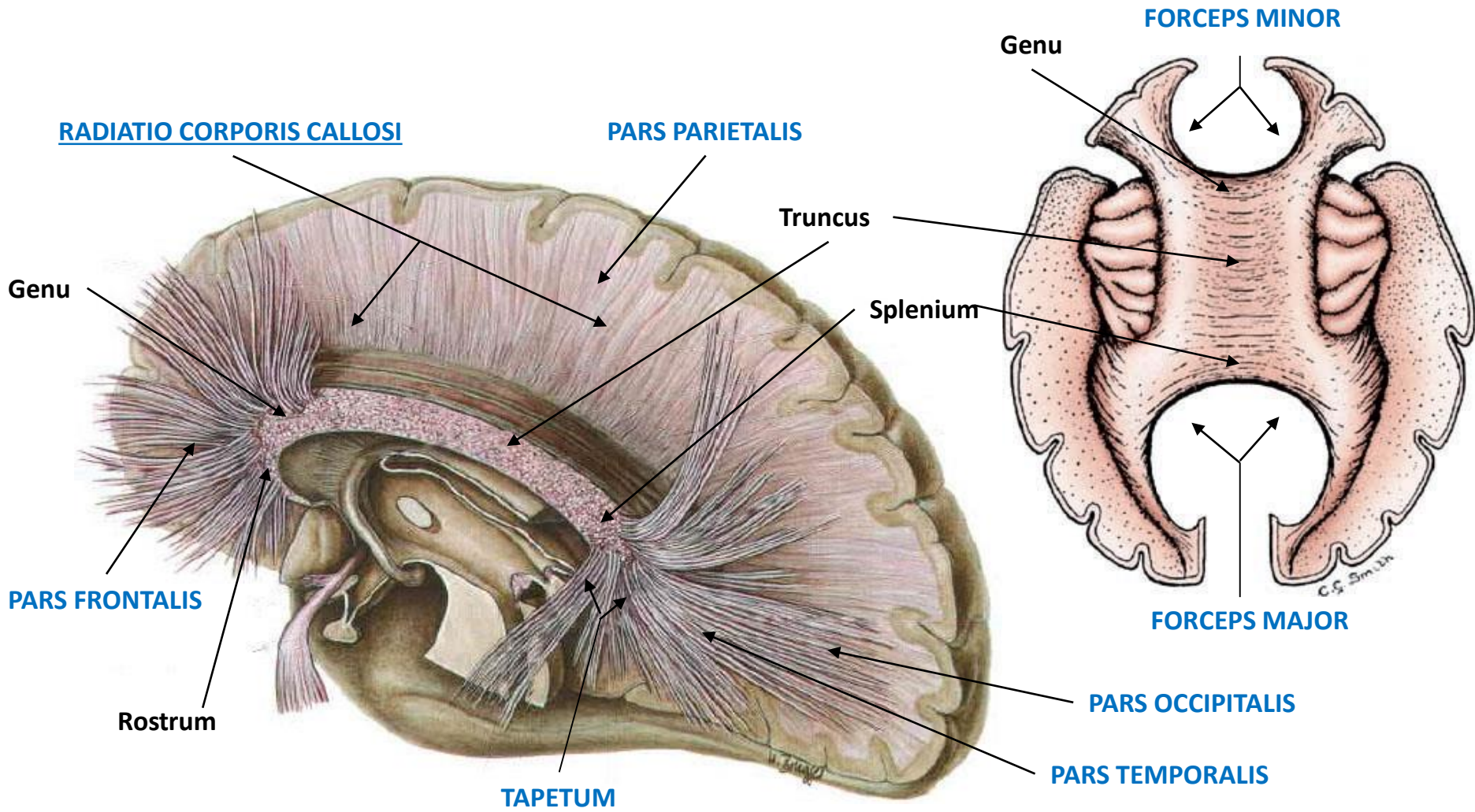
CORPUS CALLOSUM

1. LAMINA ROSTRALIS
2. ROSTRUM
3. GENU
4. TRUNCUS
5. SPLENIUM



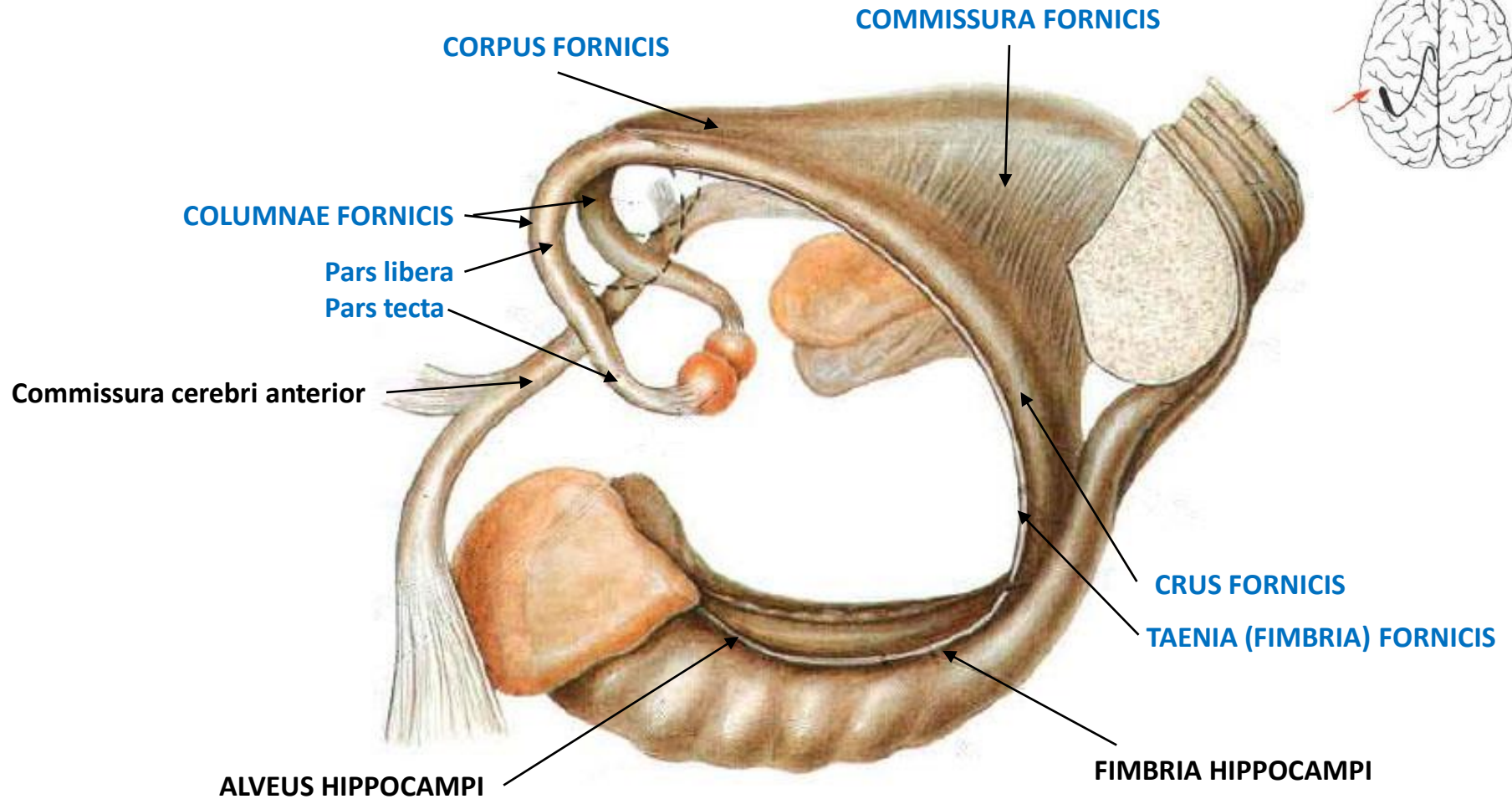
CORPUS CALLOSUM

Horizontalni presjek



Sagitalni presjek

FORNIX



An anatomical illustration of the human spine and ribcage. The spine is highlighted in a reddish-pink color, while the rest of the skeleton is shown in a translucent blue. The text "Glavni moždani putevi" is overlaid in white, bold font across the middle of the spine.

Glavni moždani putevi

Neurofibrae projectiones – projekcioni putevi

- KRATKI:

- Tr. corticothalamici
- Tr. thalamocorticales

- DUGI:

- Pravac sprovođenja impulsa
 - Aferentni
 - Eferentni
- Funkcionalna pripadnost
 - Motorni
 - Senzitivni
 - Senzorijelni

MOTORNI SISTEM

- *CENTRALNI MOTORNI SISTEM*
 - Cortex cerebralis
 - Motorni putevi
 - Subkortikalni motorni centri
 - Subkortikalni motorni putevi
- *PERIFERNI MOTORNI APARAT*
 - Periferni motorni neuroni
 - Motorne jedinice
 - Motorna ploča
 - Receptori u mišićima

EMS

- **EKSTRAPIRAMIDALNI MOTORNI SISTEM**
 - Subkortikalni motorni centri
 - Subkortikalni motorni putevi (ekstrapiramidalni motorni putevi – imaju više neurona, polisinaptični su i obrazuju neuronske krugove)
- **FUNKCIJA:**
 - Obezbjeđuje redosled voljnih pokreta
 - Reguliše tonus mišića
 - Reguliše održavanje ravnoteže
 - Upravlja automatskim pokretima

EMS

- SUBKORTIKALNI
MOTORNI CENTRI

1. Corpus striatum
2. Globus pallidus – centar za automatske pokrete
3. Nc. subthalamicus
4. Substantia nigra
5. Nc. ruber
6. Nc. intralaminare th
7. Nc. vestibulares
8. Formatio reticularis
9. Olivarni kompleks
10. Cerebellum

6-10 integracioni centri

- EKSTRAPIRAMIDALNI
MOTORNI PUTEVI

Najveći tractus tegmentalis centralis

TR. CORTICOSPINALIS

Corona radiata – pars frontalis

Cerebrum

Prednje 2/3 lobulus paracentralis
Gornje 2/3 gyrus precentralis
Capsula interna – crus posterius,
pars thalamolentiformis

Crus cerebri

Mesencephalon

Eminentia pyramidalis
fibrae pontis longitudinales

Cerebellum

Pons

Tr. corticopinalis anterior

Pyramis

Medulla oblongata

Decussatio pyramidum

Tr. corticospinalis lateralis

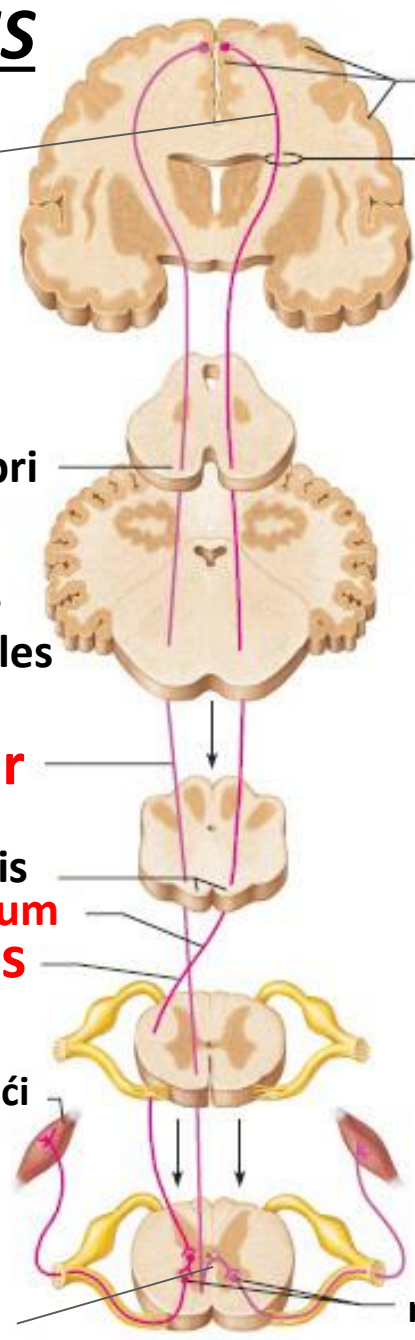
Skeletni mišići

Medulla spinalis – pars cervicalis

Medulla spinalis – pars lumbalis

Commissura alba anterior

motorna jedra m. spinalis



TR. CORTICOBULBARIS

Donja 1/3
gyrus precentralis

Corona radiata
– pars frontalis

Capsula interna
- genu

Crus cerebri

Eminentio pyramidalis

Pyramis

Foramen magnum

Cerebrum

Mesencephalon

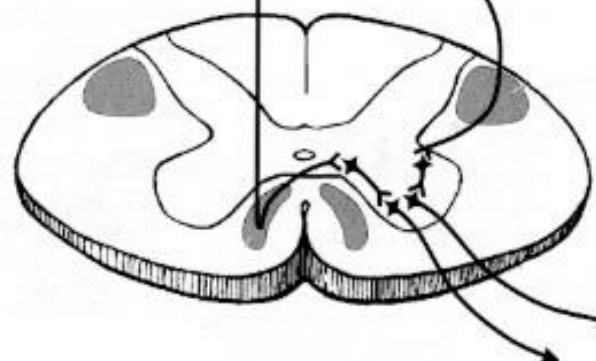
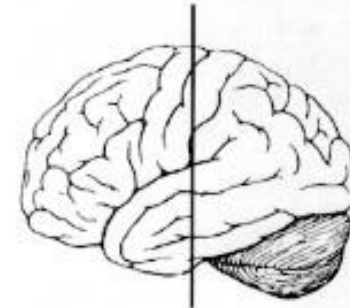
Pons

Medulla oblongata

Medulla spinalis

- III
- IV
- V
- VI
- VII
- IX
- X
- XII

● XI



SEMIDECUSSATIO
Osim za n. VII i n. XII

SENZITIVNI PUTEVI

- PODJELA SENZIBILITETA:

1. **EKSTEROCEPTIVNI** – svjesni, površni (koža)
 - a) Epikritički – fini dodir
 - b) Protopatički – grub dodir, bol, T°
2. **PROPRIOCEPTIVNI** – duboki (zglobovi, kosti, tetive)
 - a) Svjesni
 - b) Refleksni
3. **INTEROCEPTIVNI** – duboki, nesvjesni (organi, tkiva, krvni sudovi)



- **I NEURON**

- Periferni

- Tijelo - ganglion spinale i senzitivni ganglioni nn. craniales

- Periferni produžeci – receptor

- Centralni produžeci – medulla spinalis, relejna jedra, senzitivna jedra nn. craniales

- **II NEURON**

- Centralni

- Tijelo – columna posterior medulla spinalis, relejna jedra medullae oblongatae, senzitivna jedra nn. craniales

- Periferni produžeci – sinapse sa centralnim produžecima I neurona

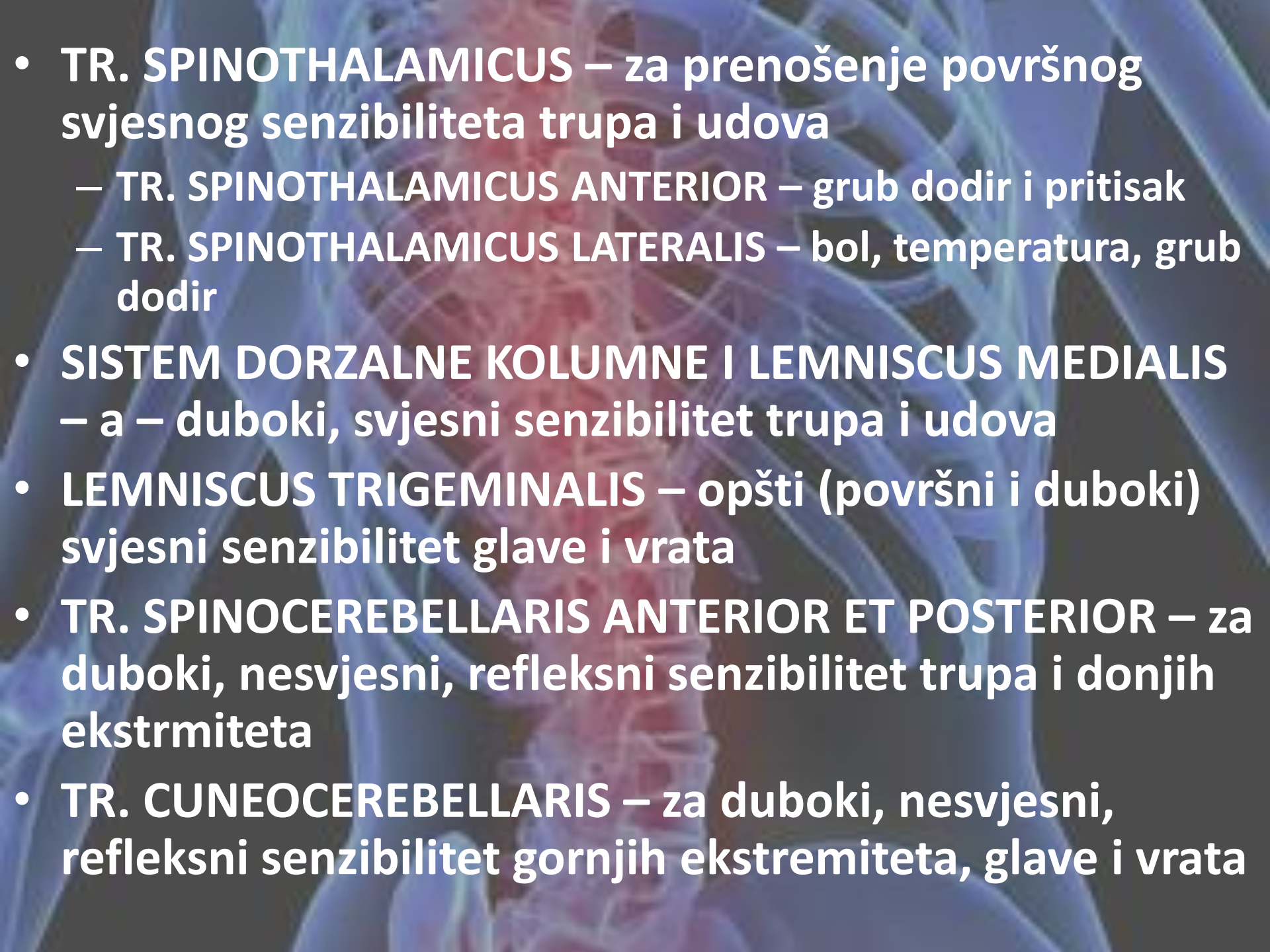
- Centralni produžeci - put

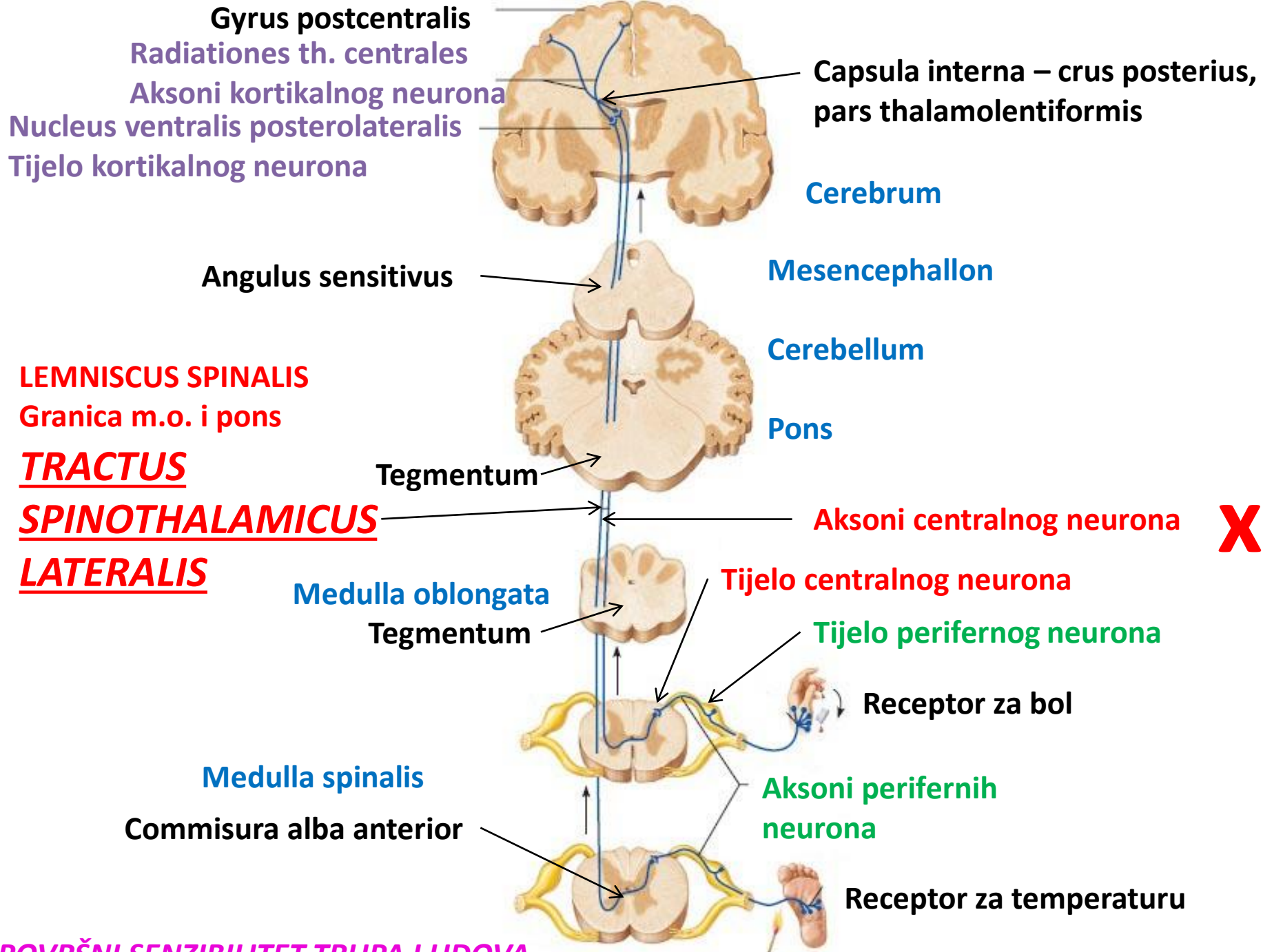
- **III NEURON**

- Kortikalni

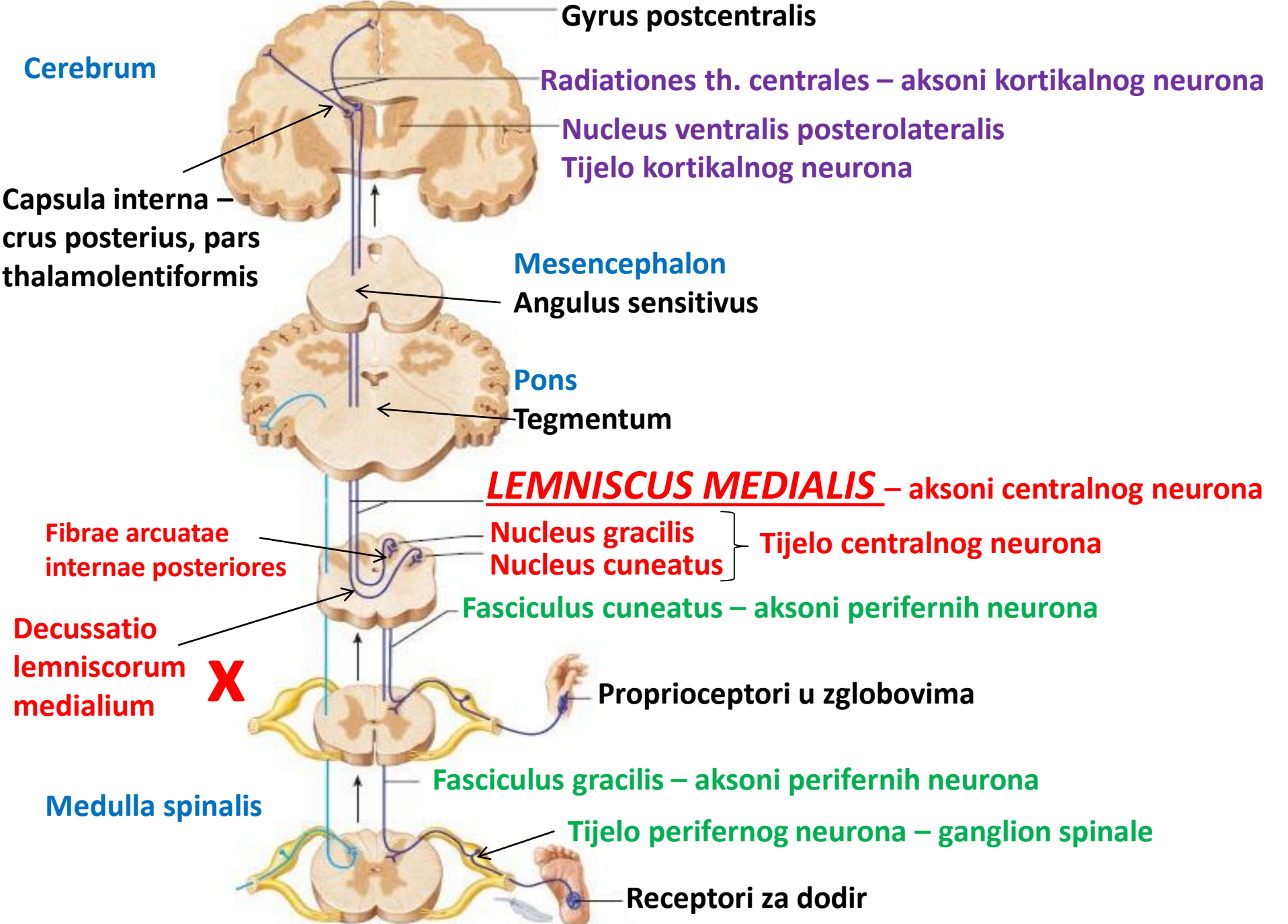
- Tijelo – jedra thalamusa

- Centralni nastavci – radiationes th. centrales do cortexa

- 
- **TR. SPINOTHALAMICUS** – za prenošenje površnog svjesnog senzibiliteta trupa i udova
 - TR. SPINOTHALAMICUS ANTERIOR – grub dodir i pritisak
 - TR. SPINOTHALAMICUS LATERALIS – bol, temperatura, grub dodir
 - **SISTEM DORZALNE KOLUMNE I LEMNISCUS MEDIALIS**
 - a – duboki, svjesni senzibilitet trupa i udova
 - **LEMNISCUS TRIGEMINALIS** – opšti (površni i duboki) svjesni senzibilitet glave i vrata
 - **TR. SPINOCEREBELLARIS ANTERIOR ET POSTERIOR** – za duboki, nesvjesni, refleksni senzibilitet trupa i donjih ekstremiteta
 - **TR. CUNEOCEREBELLARIS** – za duboki, nesvjesni, refleksni senzibilitet gornjih ekstremiteta, glave i vrata



POVRŠNI SENZIBILITET TRUPA I UDOVA



DUBOKI, SVJESNI SENZIBILITET TRUPA I UDOVA

A 3D rendering of a human skeleton in a light blue color. The spine is highlighted in a reddish-pink color, running vertically down the center of the image. The ribs and other bones are visible in the background.

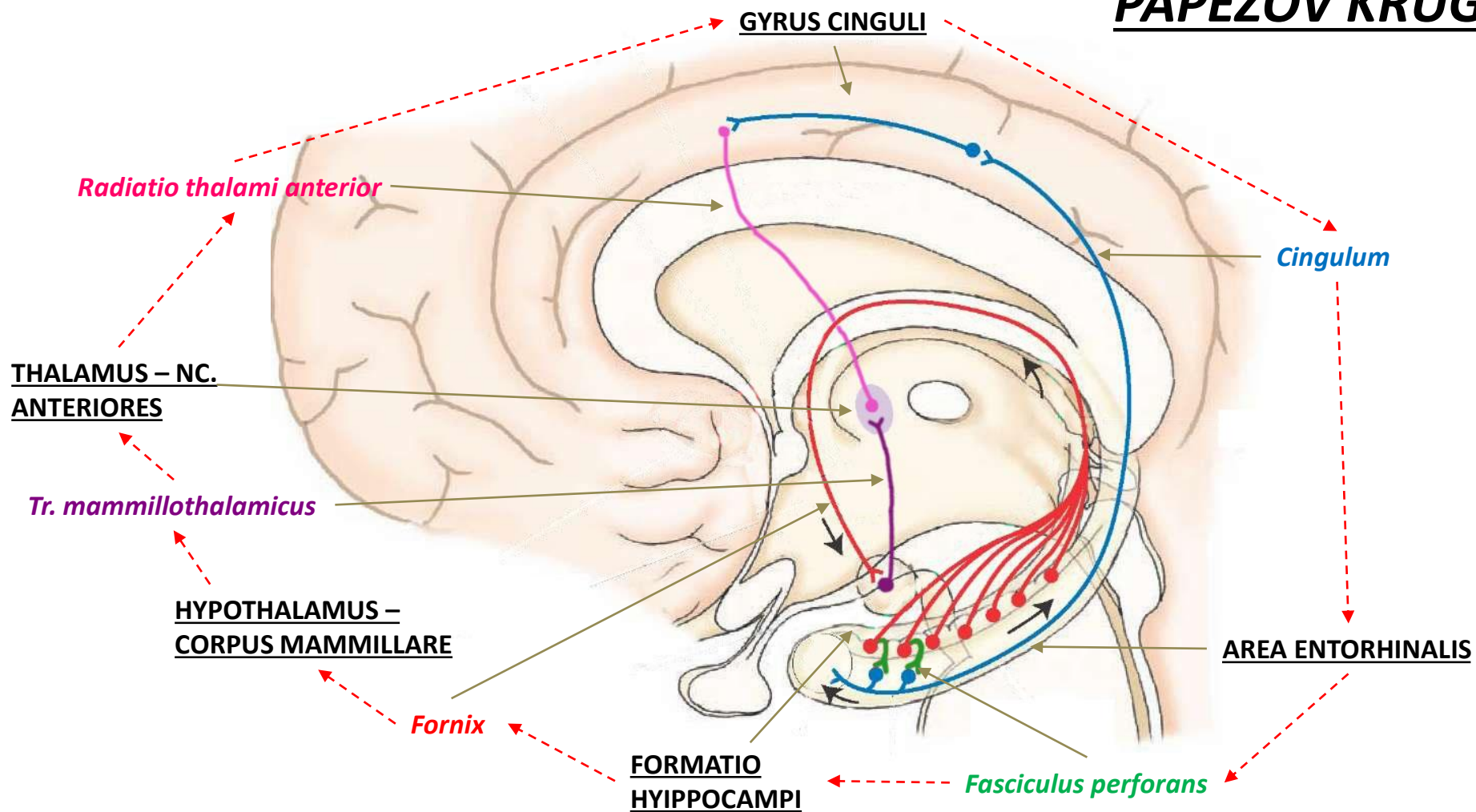
LIMBIČKI SISTEM

LIMBIČKI SISTEM

- LIMBIČKA KORA
 - MEDIJALNA OBLAST
 - BAZOLATERALNA OBLAST
- SUBKORTIKALNA LIMBIČKA JEDRA
 - AMIGDALOIDNI KOMPLEKS
 - SEPTALNI PREDIO – REGIO SEPTALIS
 - SIVE MASE BAZALNOG TELENCEPHALONA
 - NC. ANTERIORES THALAMI
 - NC. HYPOTHALAMI
 - NC. HABENULARES

LIMBIČKI SISTEM - VEZE

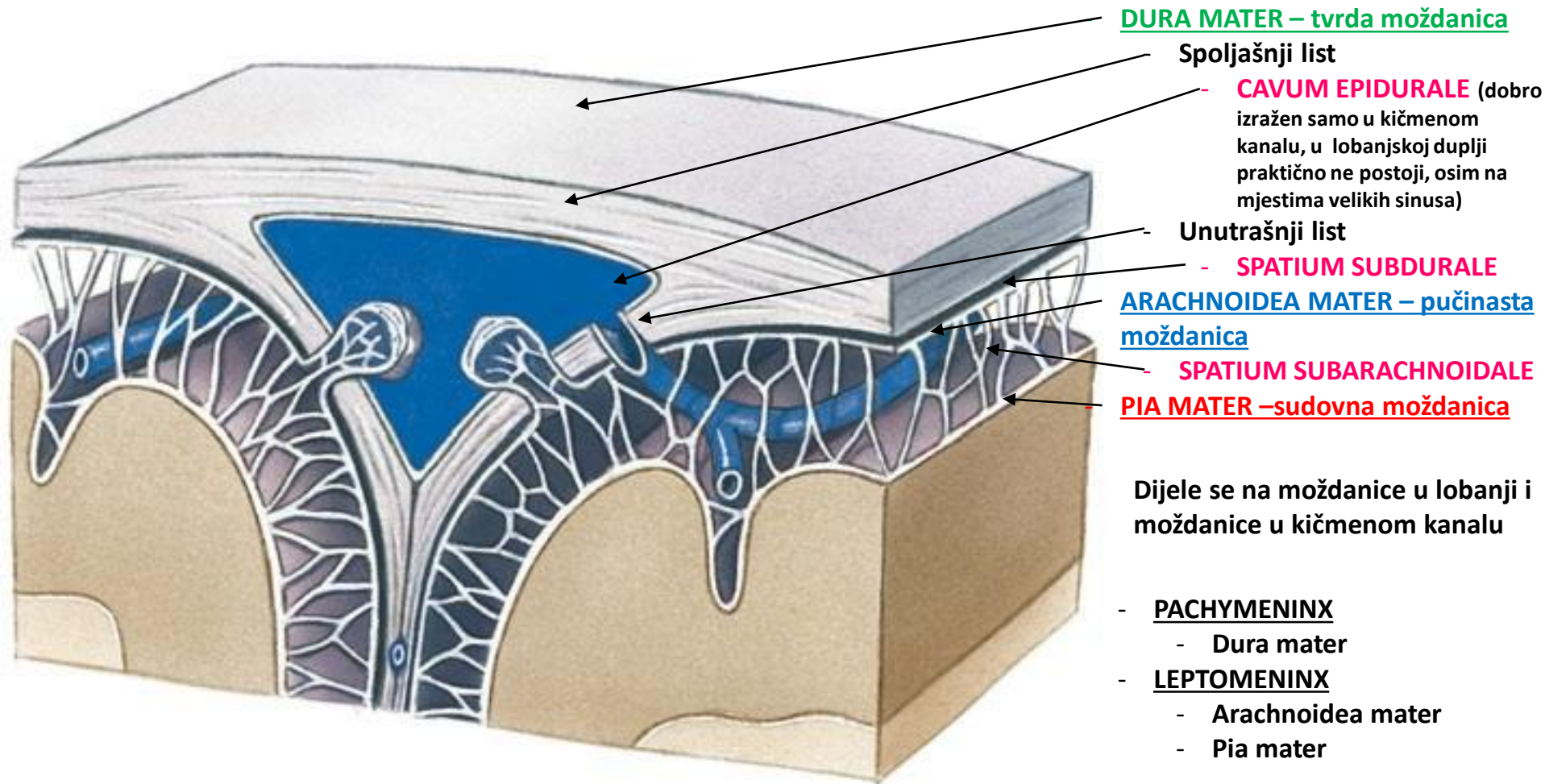
PAPEZOV KRUG



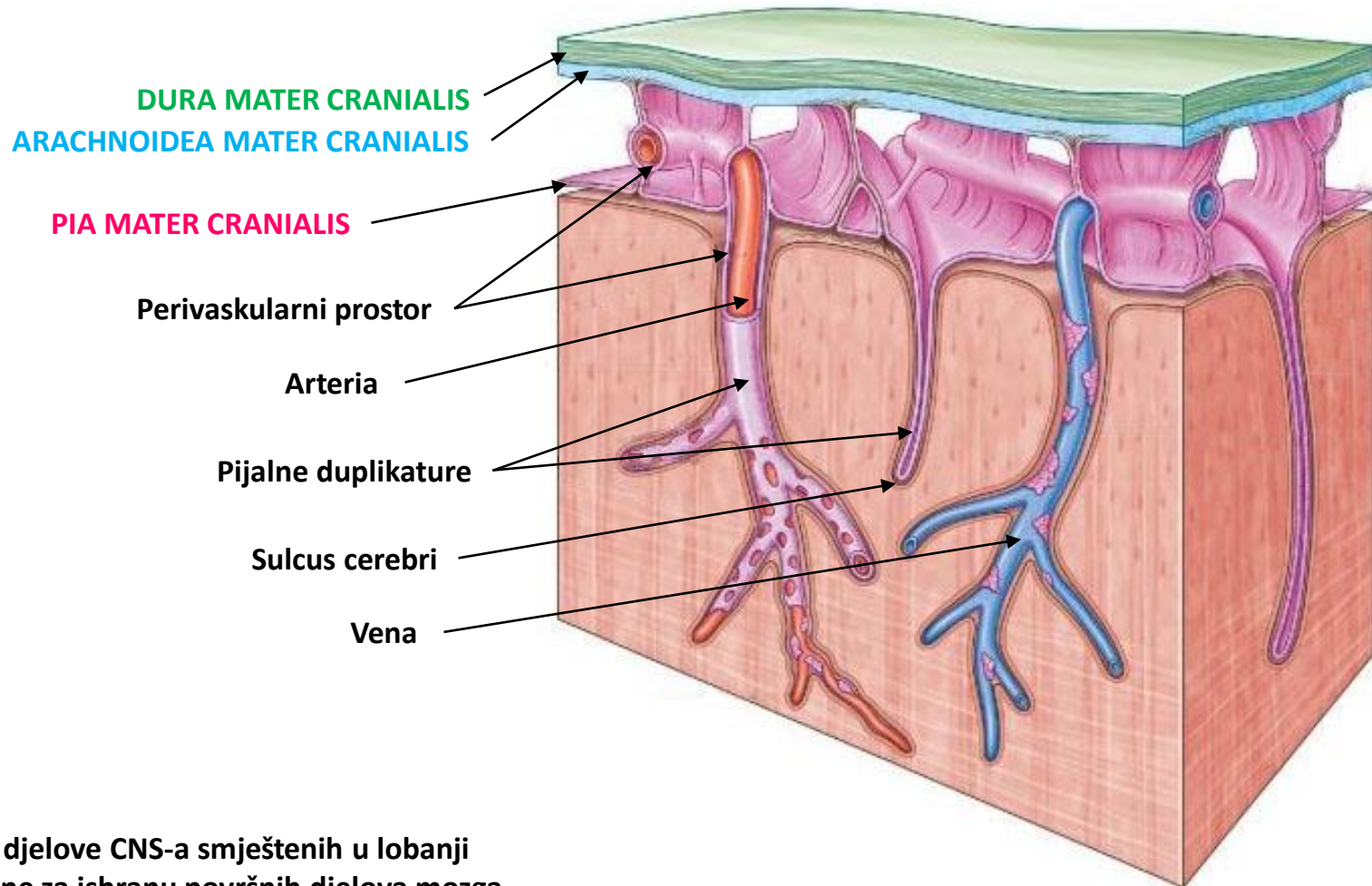
A semi-transparent blue human skeleton is shown from the front, with the spine highlighted in a reddish-pink color. The text is overlaid on the spine area.

**MENINGES –
MOŽDANE OPNE,
MOŽDANICE**

MENINGES



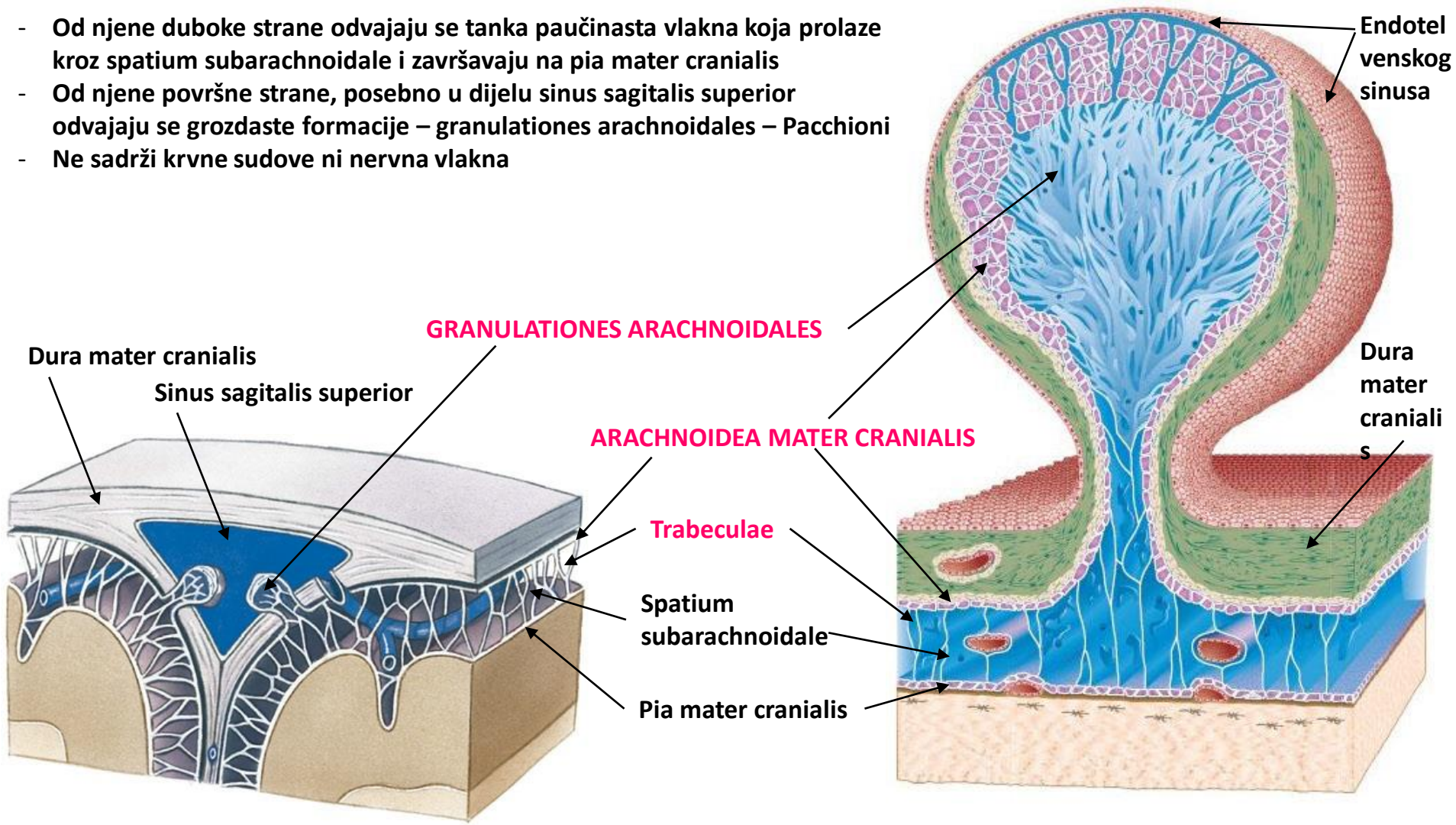
PIA MATER CRANIALIS



- Neposredno oblaže djelove CNS-a smještenih u lobanji
- Sadrži arterijske grane za ishranu površnih djelova mozga
- Sa zidom krvnog suda ograničava perivaskularne prostore
- Inervišu je simpatička vlakna

ARACHNOIDEA MATER CRANIALIS

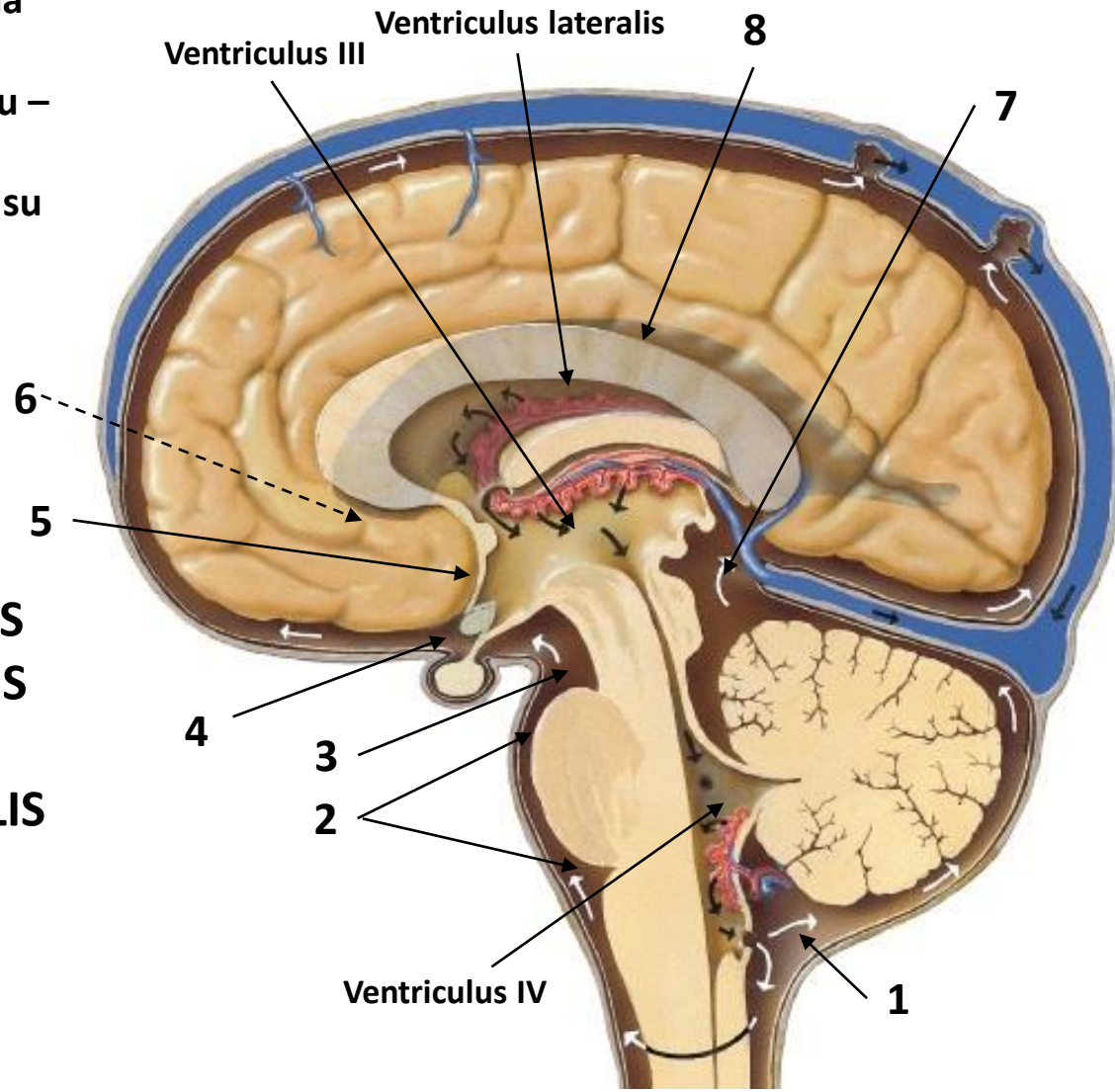
- Od njene duboke strane odvajaju se tanka paučinasta vlakna koja prolaze kroz spatium subarachnoidale i završavaju na pia mater cranialis
- Od njene površne strane, posebno u dijelu sinus sagitalis superior odvajaju se grozdaste formacije – granulationes arachnoidales – Pacchioni
- Ne sadrži krvne sudove ni nervna vlakna



SPATIUM SUBARACHNOIDALE

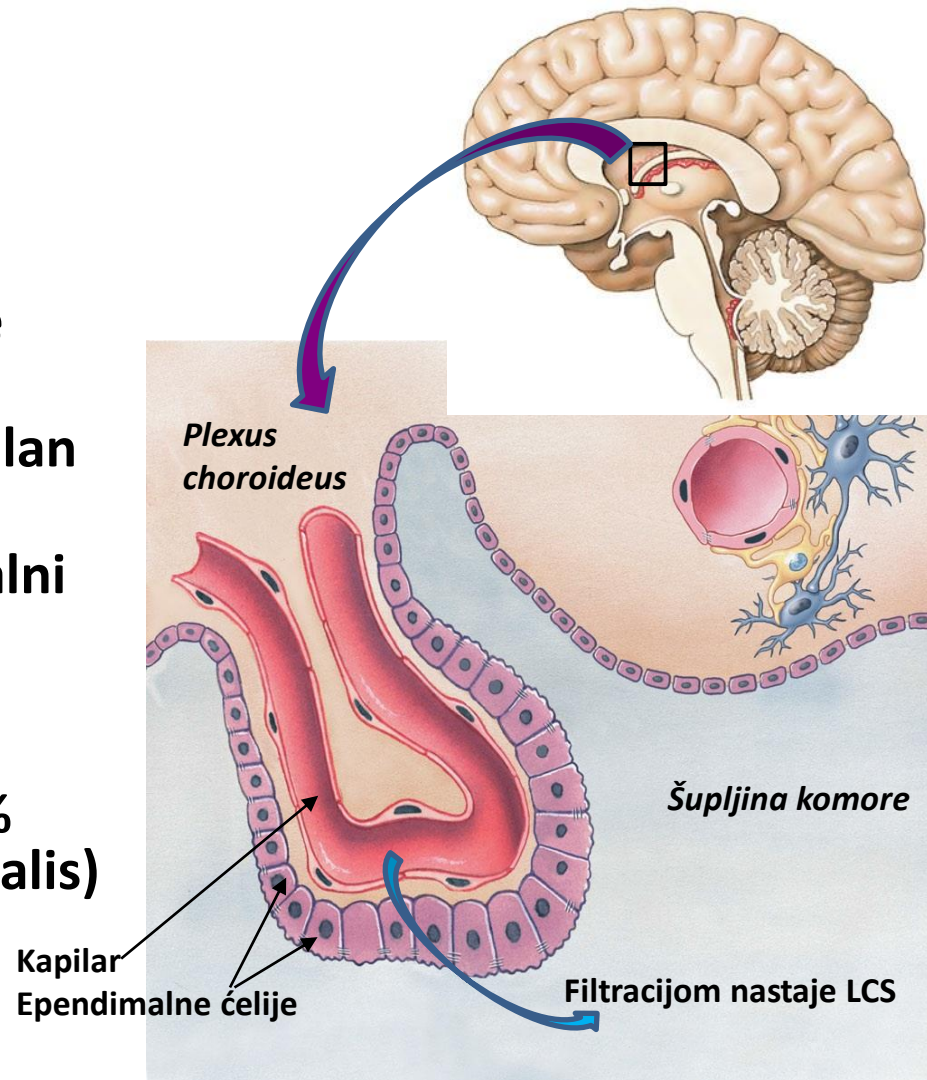
- Prostor između arachnoidea mater i pia mater
- Ispunjen je cerebrospinalnom tečnošću – liquor cerebrospinalis
- Proširenja subarahnoidalnog prostora su cistjerne – cisternae subarachnoidales

1. CISTERNA CEREBELLOMEDULLARIS S. MAGNA
2. CISTERNA PONTOCEREBELLARIS
3. CISTERNA INTERPEDUNCULARIS
4. CISTERNA CHIASMATICA
5. CISTERNA LAMINAE TERMINALIS
6. CISTERNA FOSSAE LATERALIS CEREBRI
7. CISTERNA AMBIENS S. VENAE CEREBRI MAGNAE
8. CISTERNA CORPORIS CALLOSI

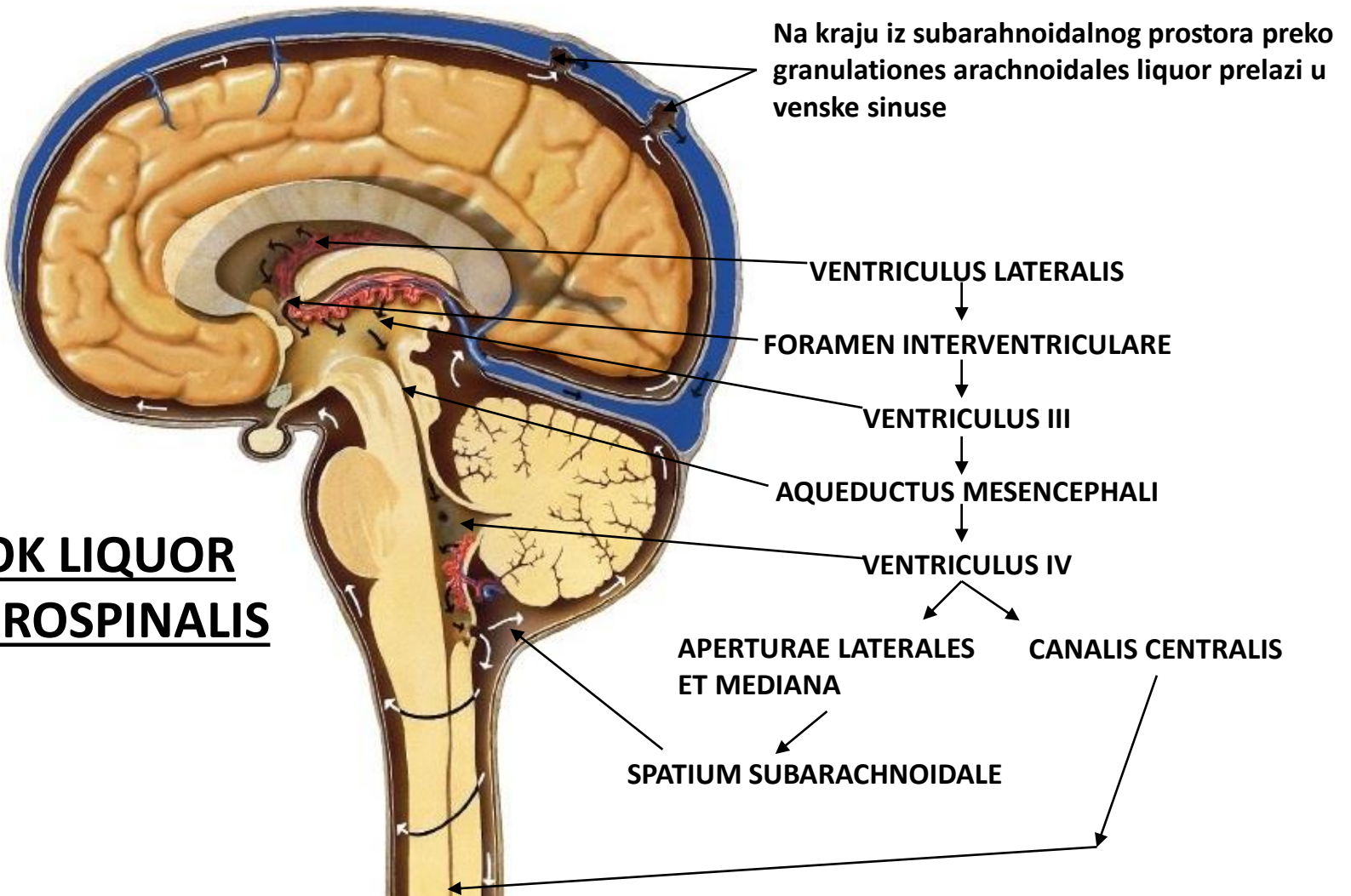


LIQUOR CEREBROSPINALIS

- Bistra, providna tečnost, specifične težine 1004-1007 (1006-1009)
- Ne sadrži ćelijske elemente, normalan nalaz 1-5
- Ispunjava moždane komore, centralni kanal kičmene moždine i subarahnoidalni prostor
- Neprekidno se stvara u horoidnim pleksusima moždanih komora (95% plexus choroideus ventriculus lateralis) u količini od 500ml za 24 h



PROTOK LIQUOR CEREBROSPINALIS



LIQUOR CEREBROSPINALIS

- Na ovaj način se održava intrakranijalni pritisak koji normalno iznosi:
 - 70-200 mm H₂O stuba u ležećem položaju
 - 300-400 mm u sjedećem položaju
- Bilo kakva barijera u protoku LCS (urođena ili stečena), dovodi do povećana intrakranijalnog pritiska, koji opet ima za posljedicu različite poremećaje u CNS-u
- Hydrocephalus internus – komore
- Hydrocephalus externus – sinusi
- Uloga LCS:
 - Vodeno jastučje
 - Eliminacija produkata metabolizma
 - Nutritivna

Hydrocephalus kod novorođenčeta



DURA MATER CRANIALIS

1. FALX CEREBRI

- Između hemisfera velikog mozga
- Gornjim rubom se pripaja za sulcus sinus sagitalis superior i sadrži sinus sagitalis superior (a)
- Donji rub je slobodan i sadrži sinus sagitalis inferior (b)
- Naprijed se pripaja za cristu gali
- Pozadi se pripaja za tentorium cerebelli i u tom dijelu se nalazi sinus rectus (c)

2. TENTORIUM CEREBELLI

- Odvaja hemisfere malog i velikog mozga
- Zadnjim krajem se pripaja za sulcus sinus transveri i sadrži sinus transversus (d)
- Spoljnim ivicama se pripaja duž margo superior partis petrose i sadrži sinus petrosus superior

3. FALX CEREBELLI

- Između hemisfera malog mozga
- Gornjim krajem pripaja se za tentorium cerebelli
- Zadnjom ivicom pripaja se za crista occipitalis interna i sadrži sinus occipitalis (e)

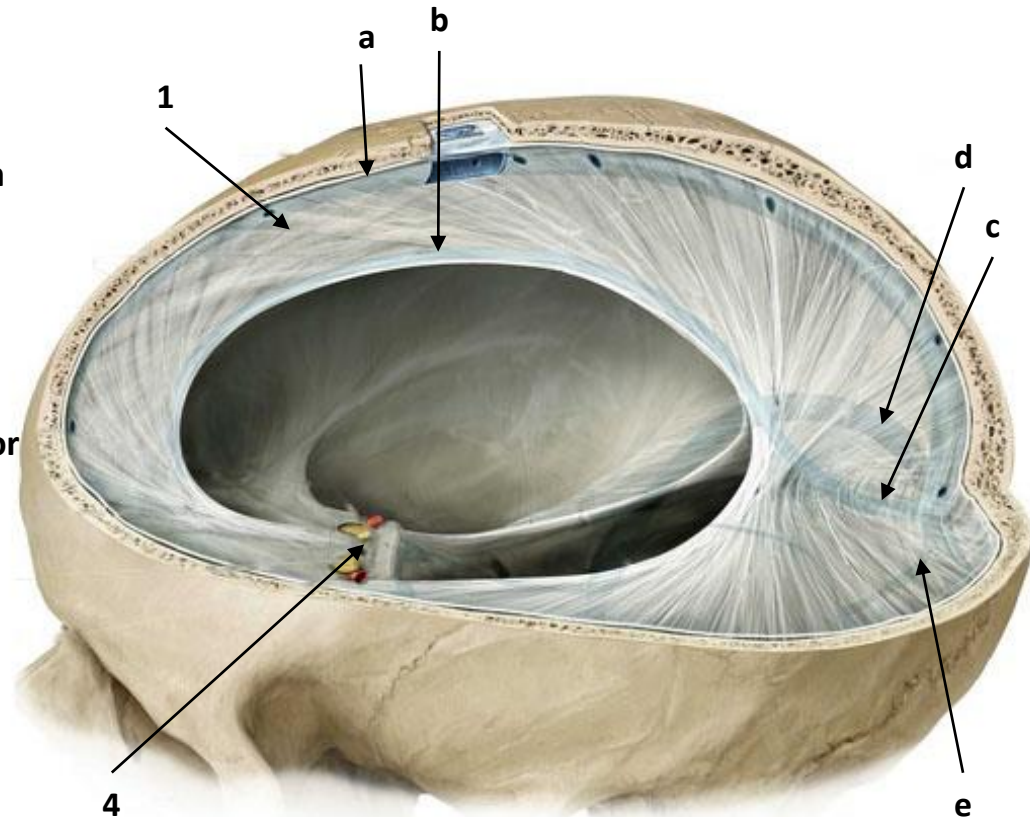
4. DIAPHRAGMA SELLAE

- Pokriva fossu hypophysialis

5. CAVUM TRIGEMINALE

- Sadrži ganglion trigeminale

Sastoji se od spoljašnjeg i unutrašnjeg lista
Unutrašnji list obrazuje tvorevine durae mater



MENINGES – CANALIS VERTEBRALIS

Spoljašnji list – ima ulogu pokosnice, završava se na donjem kraju os coccygis

Unutrašnji list – završava se u nivou S2 i nastavlja se končićem – filum durae matris spinalis

Epiduralni prostor – ispunjen masnim tkivom i venskim spletovima

DURA MATER SPINALIS

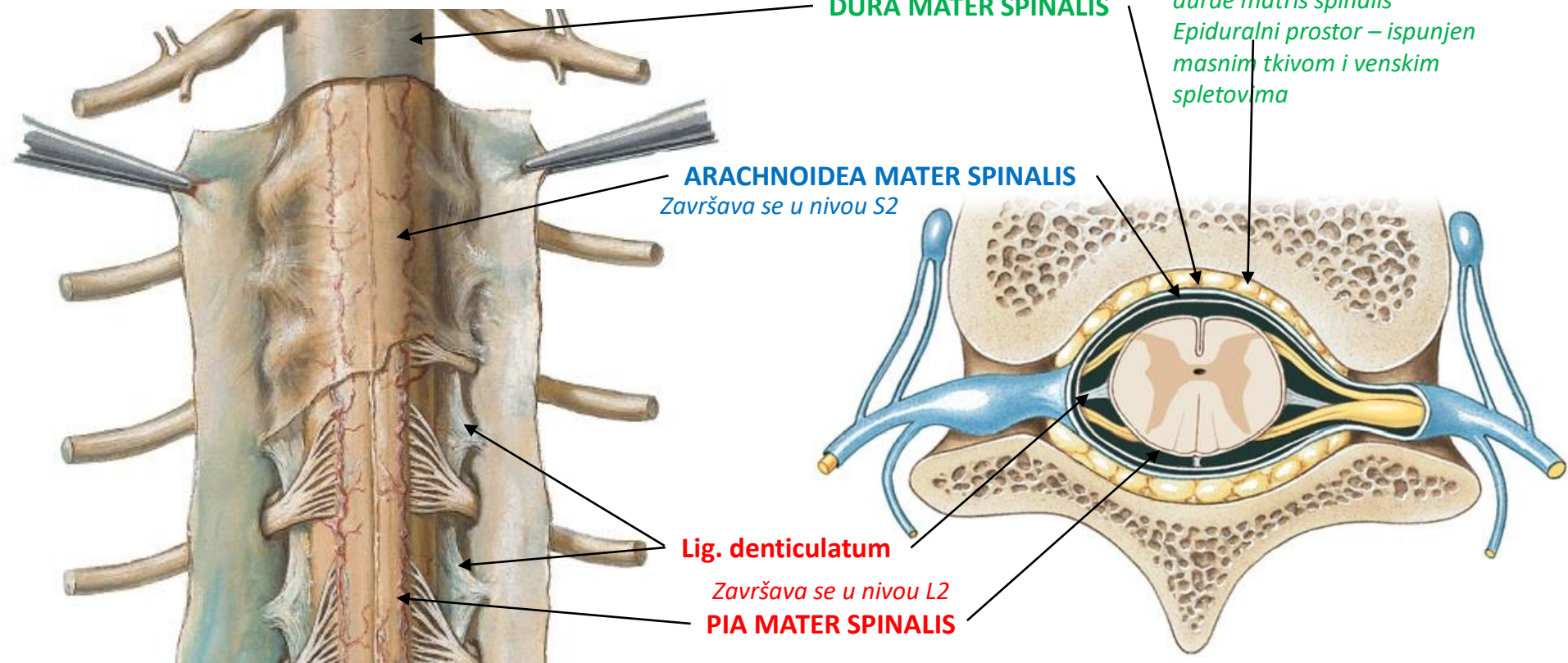
ARACHNOIDEA MATER SPINALIS

Završava se u nivou S2

Lig. denticulatum

Završava se u nivou L2

PIA MATER SPINALIS



CISTERNA LUMBALIS S. TERMINALIS

- Nalazi se u kičmenom kanalu, ispod conus medullaris, od L2 do S2 kičmenog pršljena
- Sadrži čiquor cerebrospinalis i cauda equina
- Lumbalna punkcija L3-L4, L4-L5, kroz ligg. flava i dura mater spinalis

