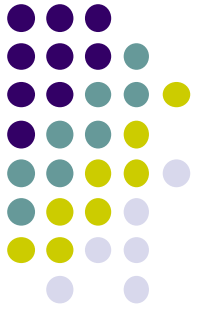


White Matter of the Cerebral Hemispheres



- 1) Commissural fibers
 - 2) Association fibers
 - 3) Projection fibers
- Commissure fibers connect corresponding regions of the two hemispheres.
 - Corpus callosum
 - Anterior commissure
 - Posterior commissure
 - Fornix
 - Habenular commissure.

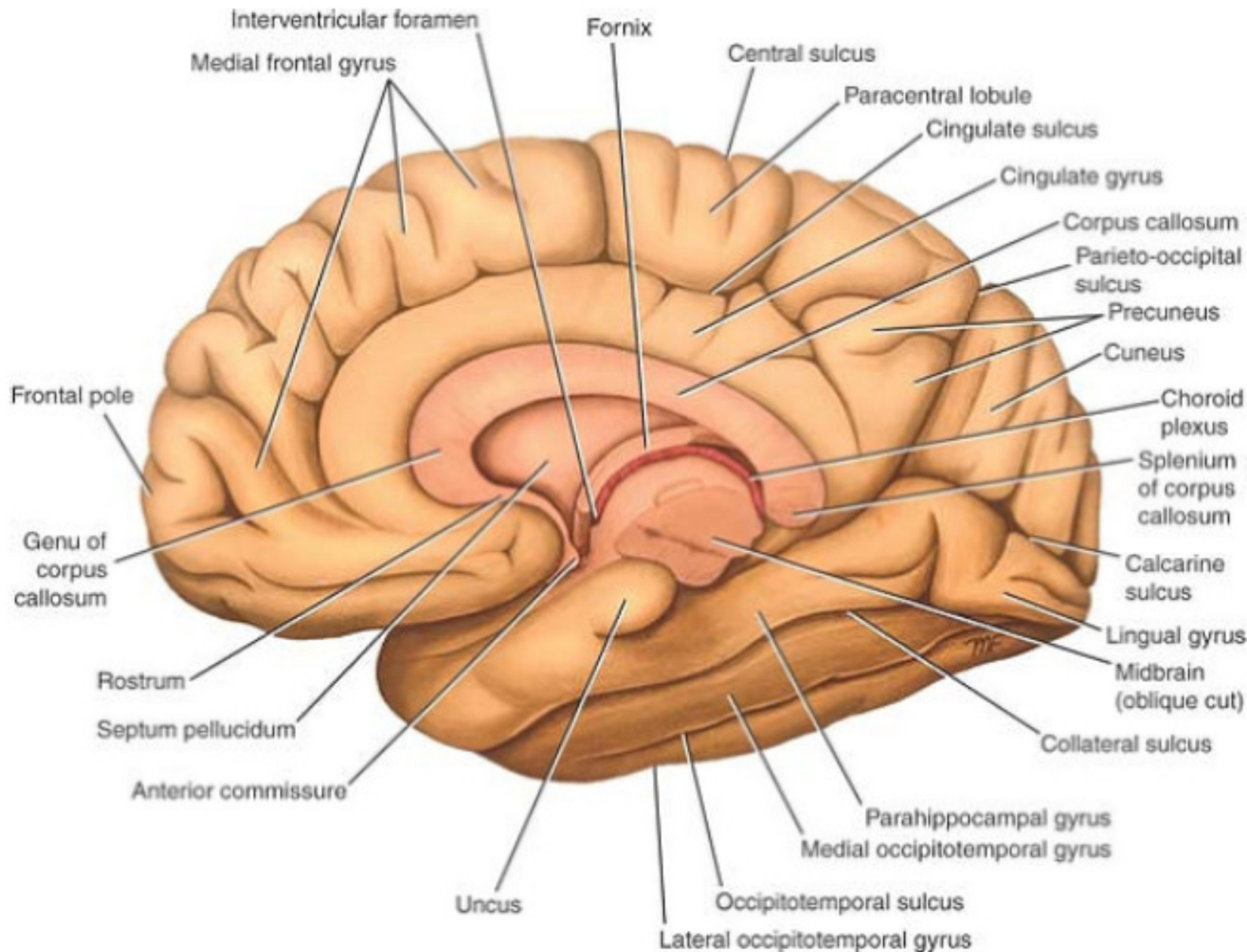
The corpus callosum

- The largest commissure of the brain, connects the two cerebral hemispheres (at the bottom of the longitudinal fissure)

- Divided into:

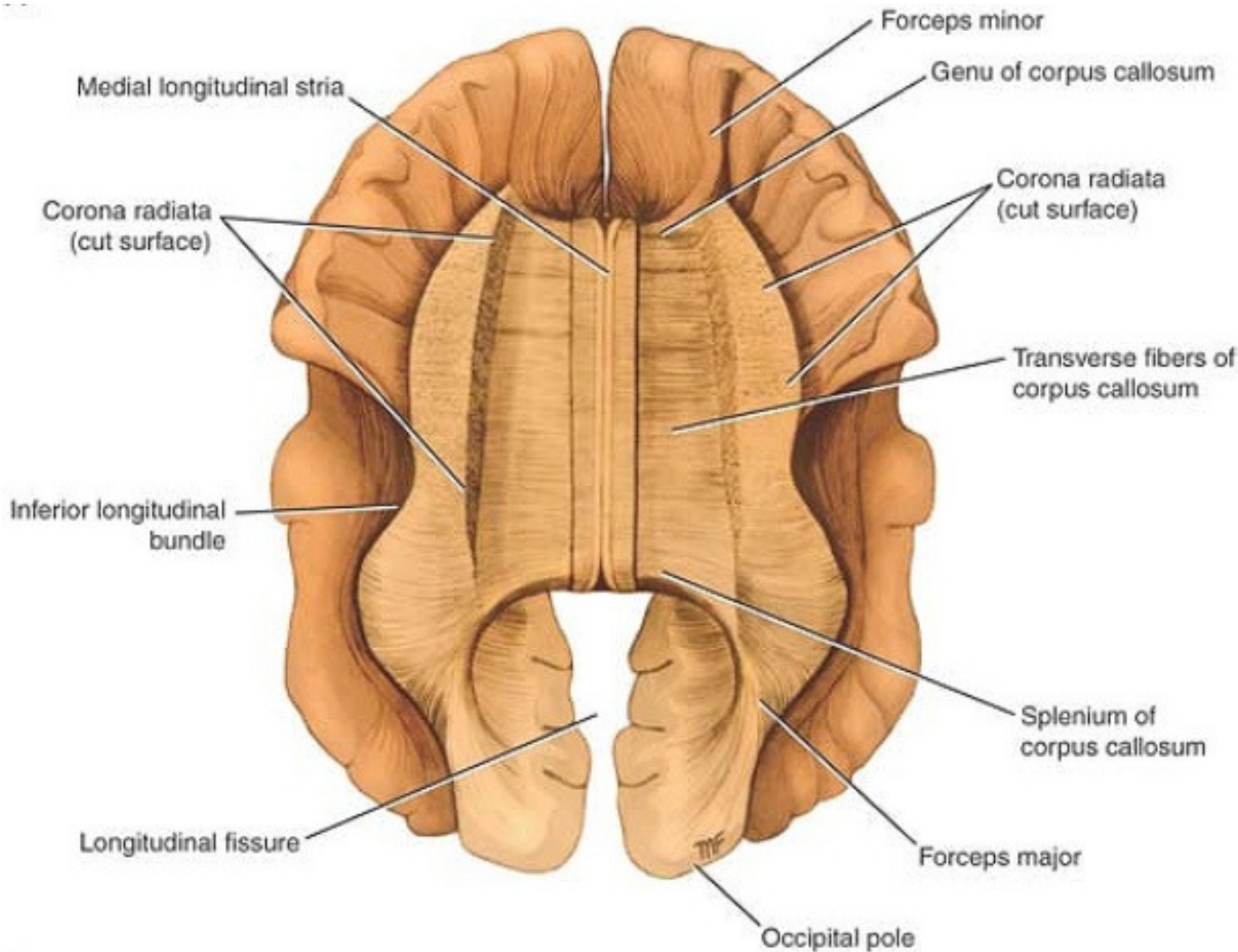
- **Rostrum:** continuous with the upper end of the lamina terminalis

- **Genu:** bends inferiorly in front of the septum pellucidum
- **Body**
- **Splenium**



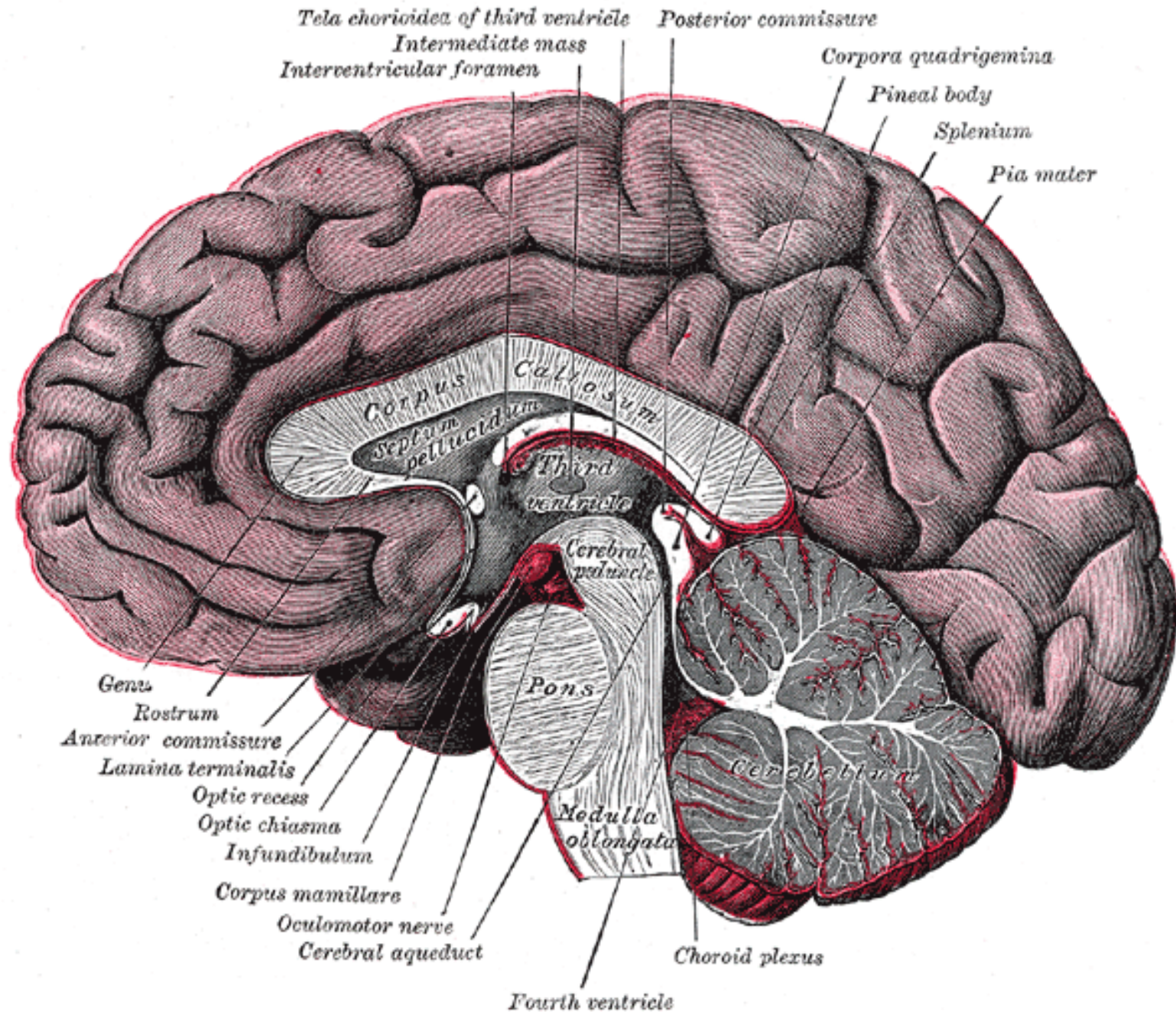
The corpus callosum

- Forceps minor
- Radiation of the corpus callosum
- Forceps major



Anterior commissure

- Crosses the midline in the **lamina terminalis**
- **Smaller bundle** (anterior) curves forward toward the olfactory tract.
- **Large bundle** (posterior) curves to reach the temporal lobes



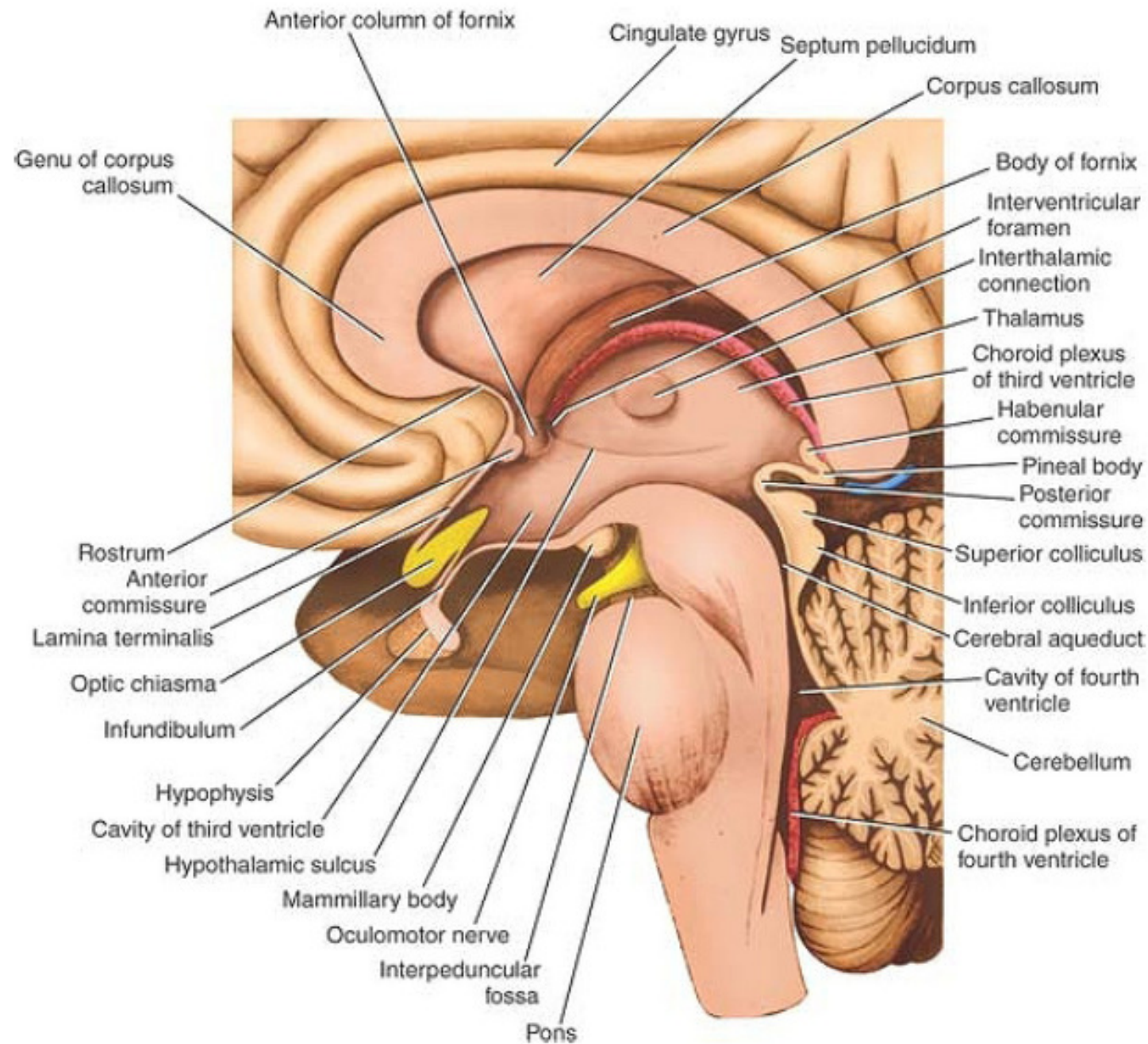
**plays a key role in pain and pain sensation???

Posterior commissure

- Crosses the midline immediately above the opening of the cerebral aqueduct into the third ventricle (involved in the pupillary light reflex)?

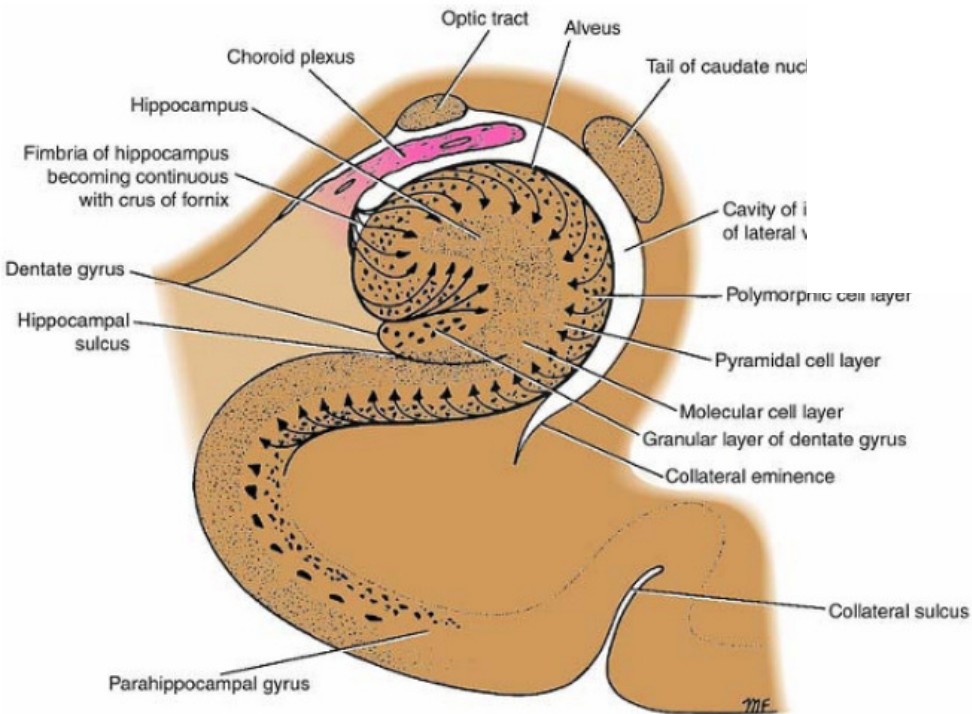
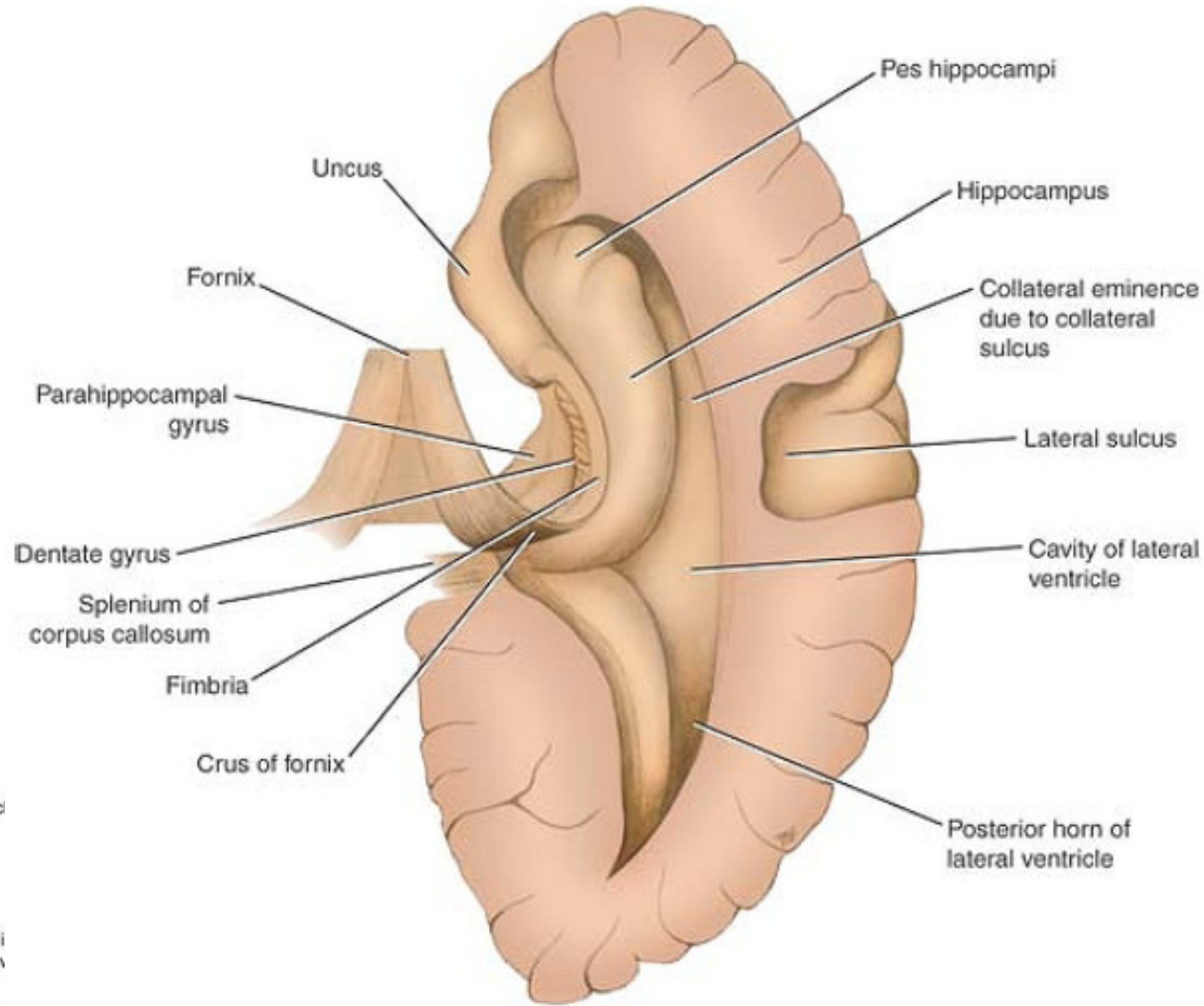
Habenular commissure

- Crosses the midline in the superior part of the root of the pineal stalk
- connects the Habenular nuclei on both sides



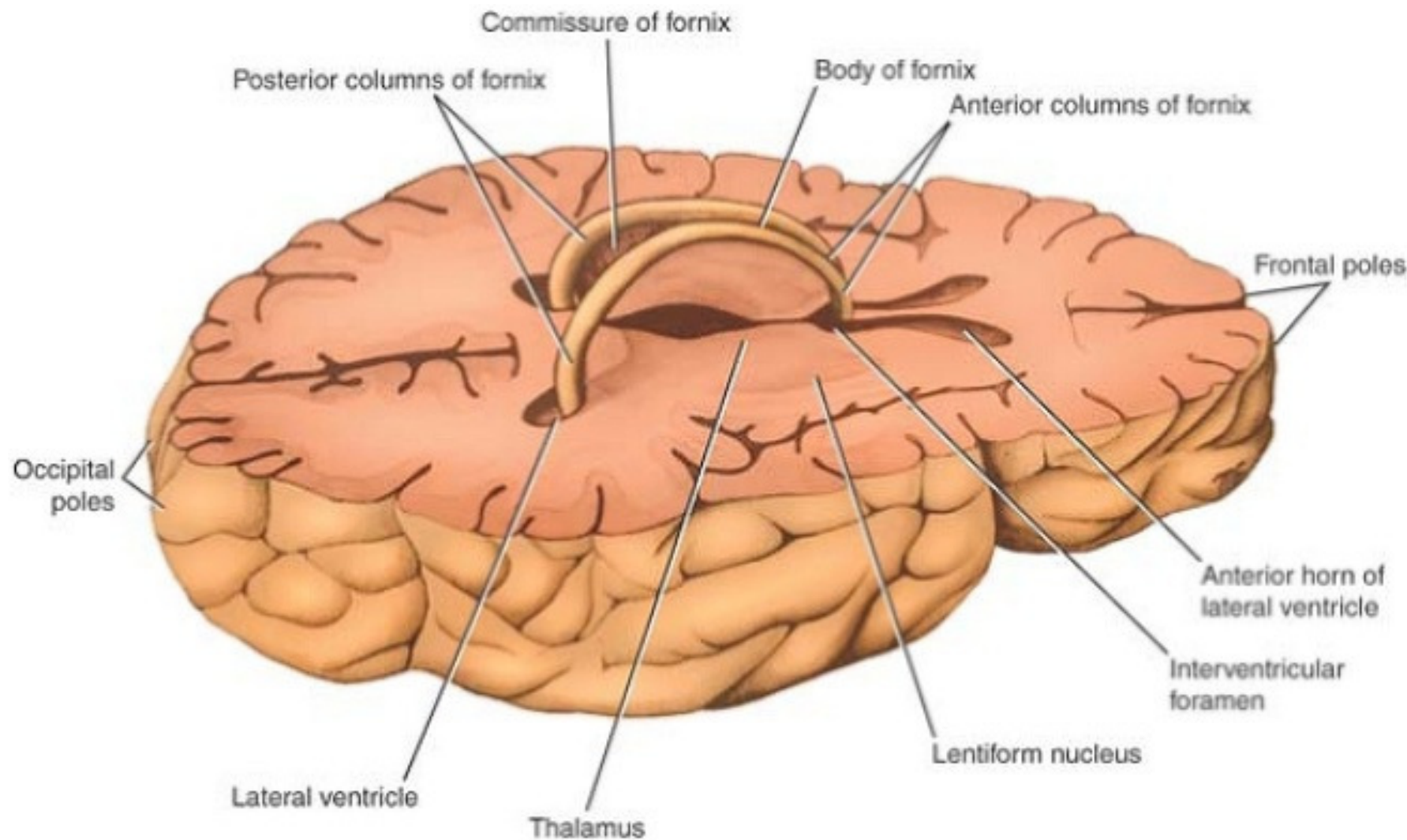
The fornix

- From the hippocampus to the hypothalamus.



- The nerve fibers first form the alveus, (thin layer of white matter covering the ventricular surface of the hippocampus), then converge to form the fimbria.

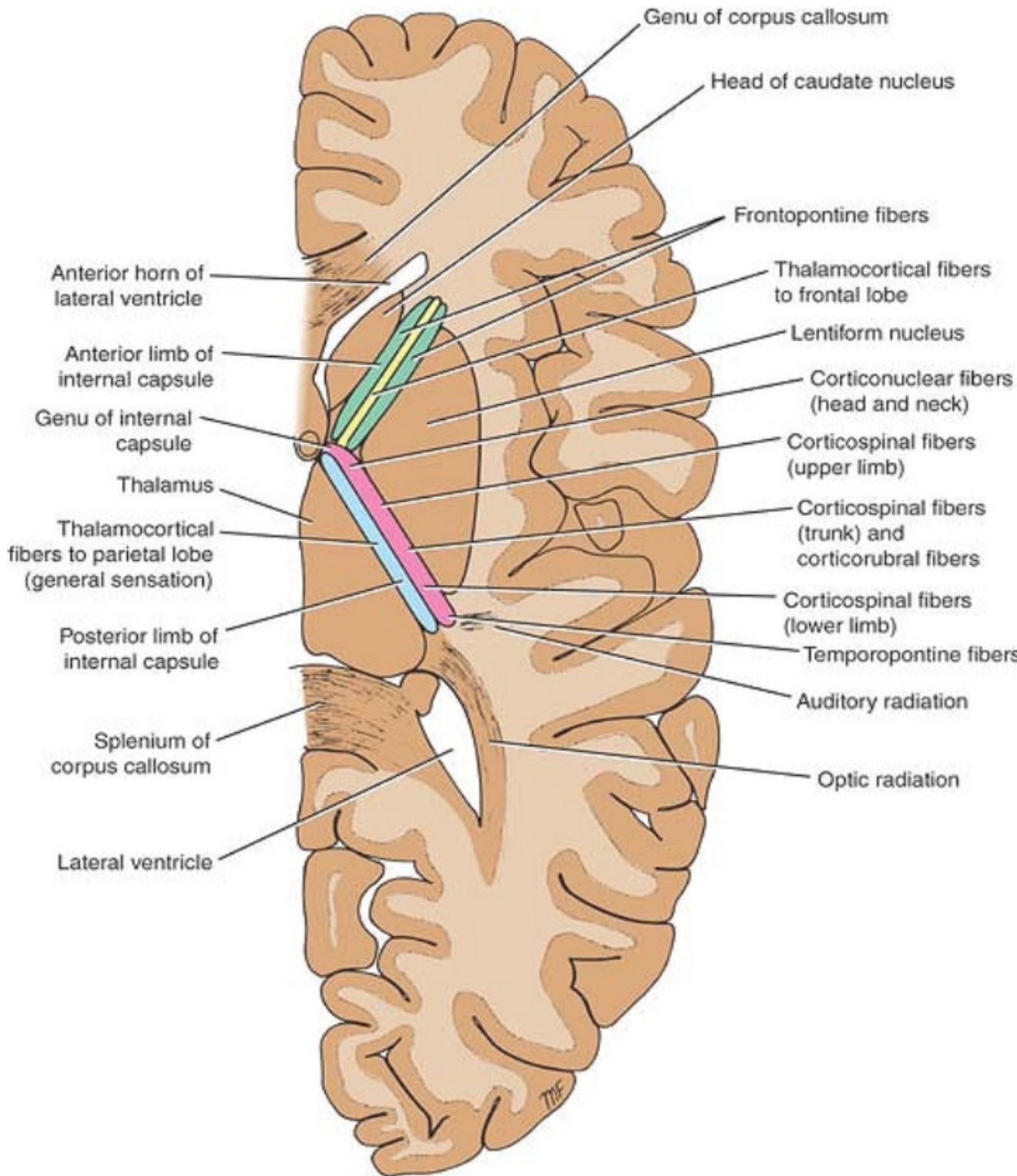
Fornix



- The fimbriae of the two sides arch forward above the thalamus and below the corpus callosum to form the posterior columns of the fornix.
- The two columns then come together in the midline to form the body of the fornix
- The commissure of the fornix consists of transverse fibers that cross the midline from one column to another just before the formation of the body of the fornix.

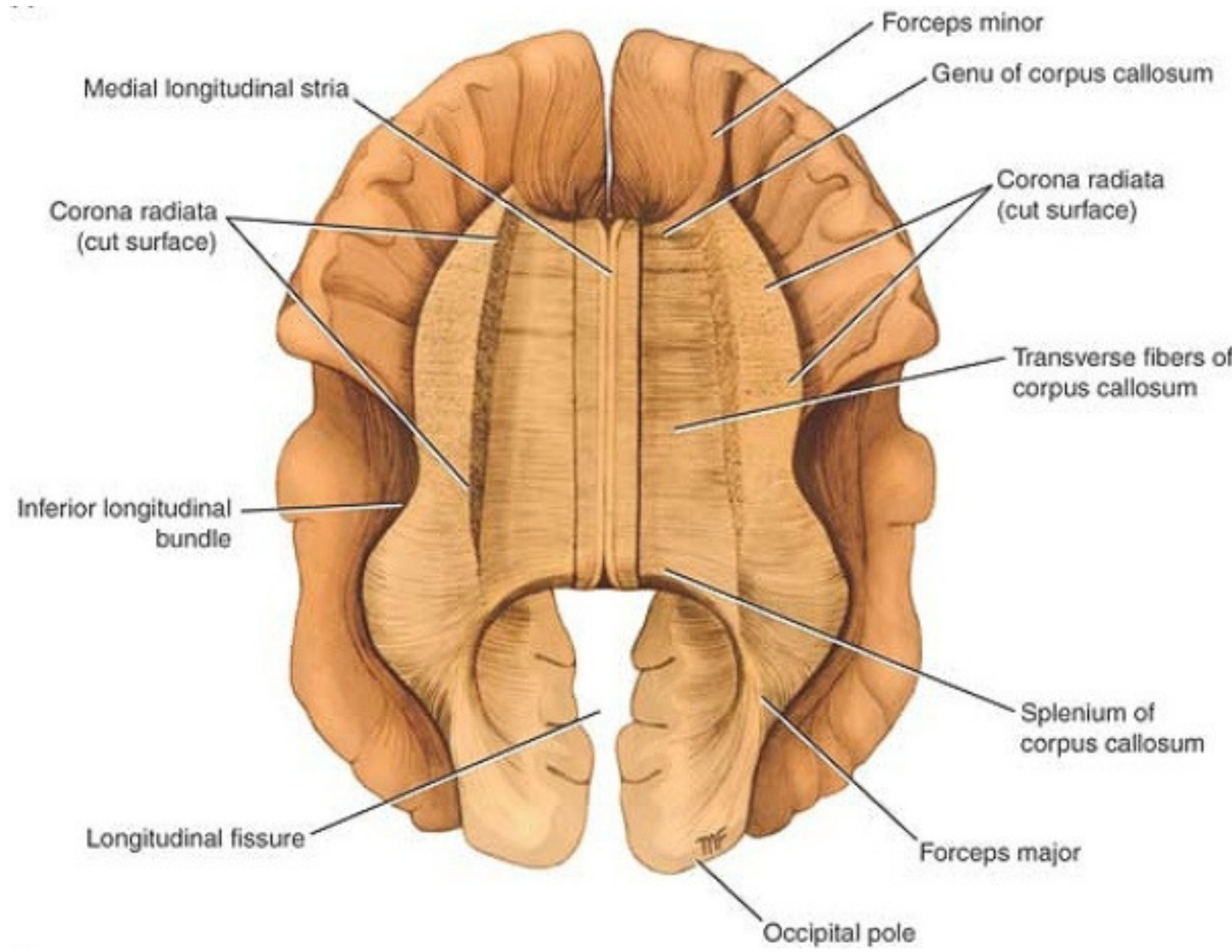
Projection Fibers

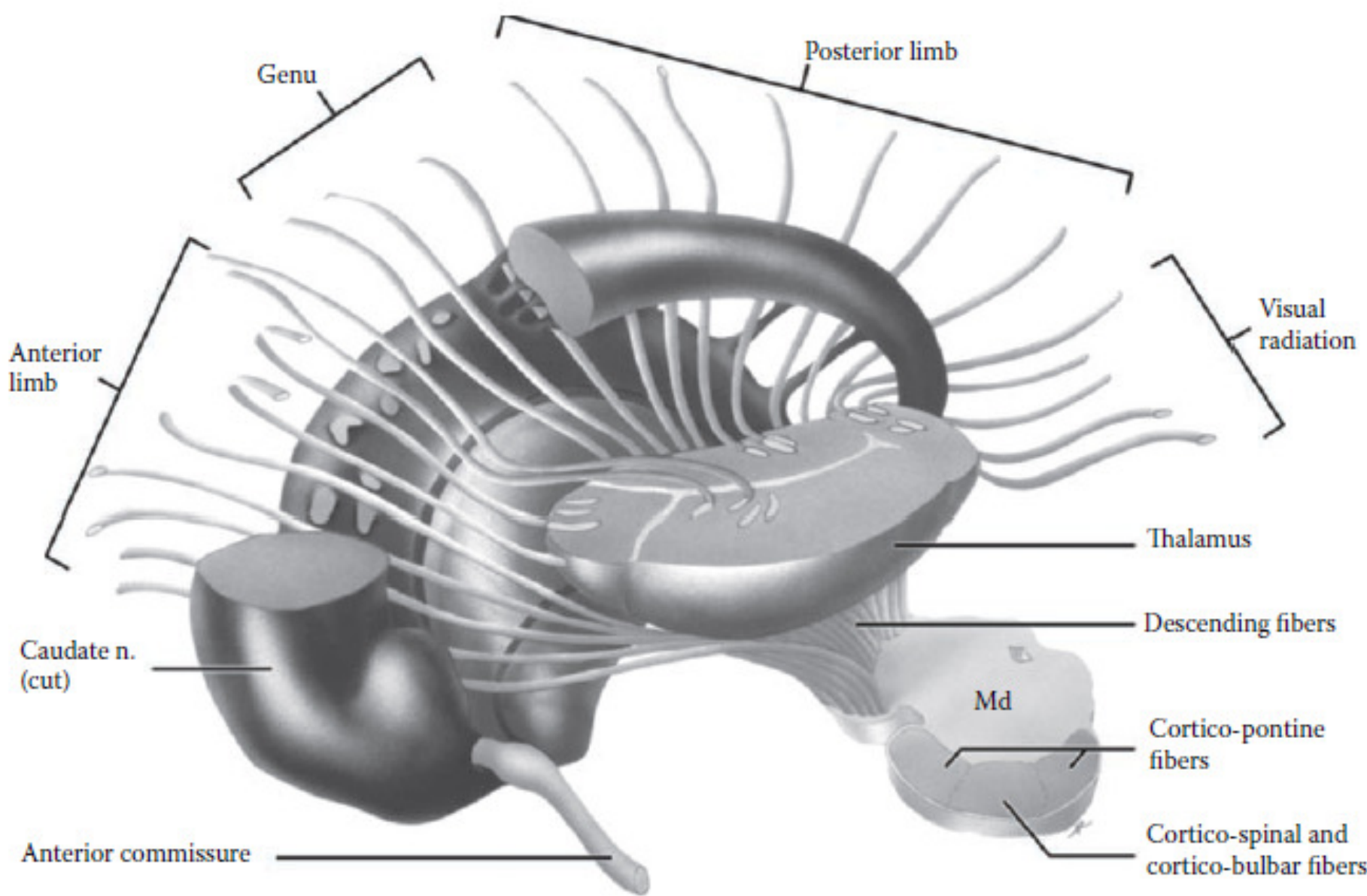
- Passing to and from the brainstem to the entire cerebral cortex
- **Internal capsule:**
 - **Anterior limb**
 - **Posterior limb**
 - **Genu**
- Medially: caudate nucleus and the thalamus
- Laterally: the lentiform nucleus



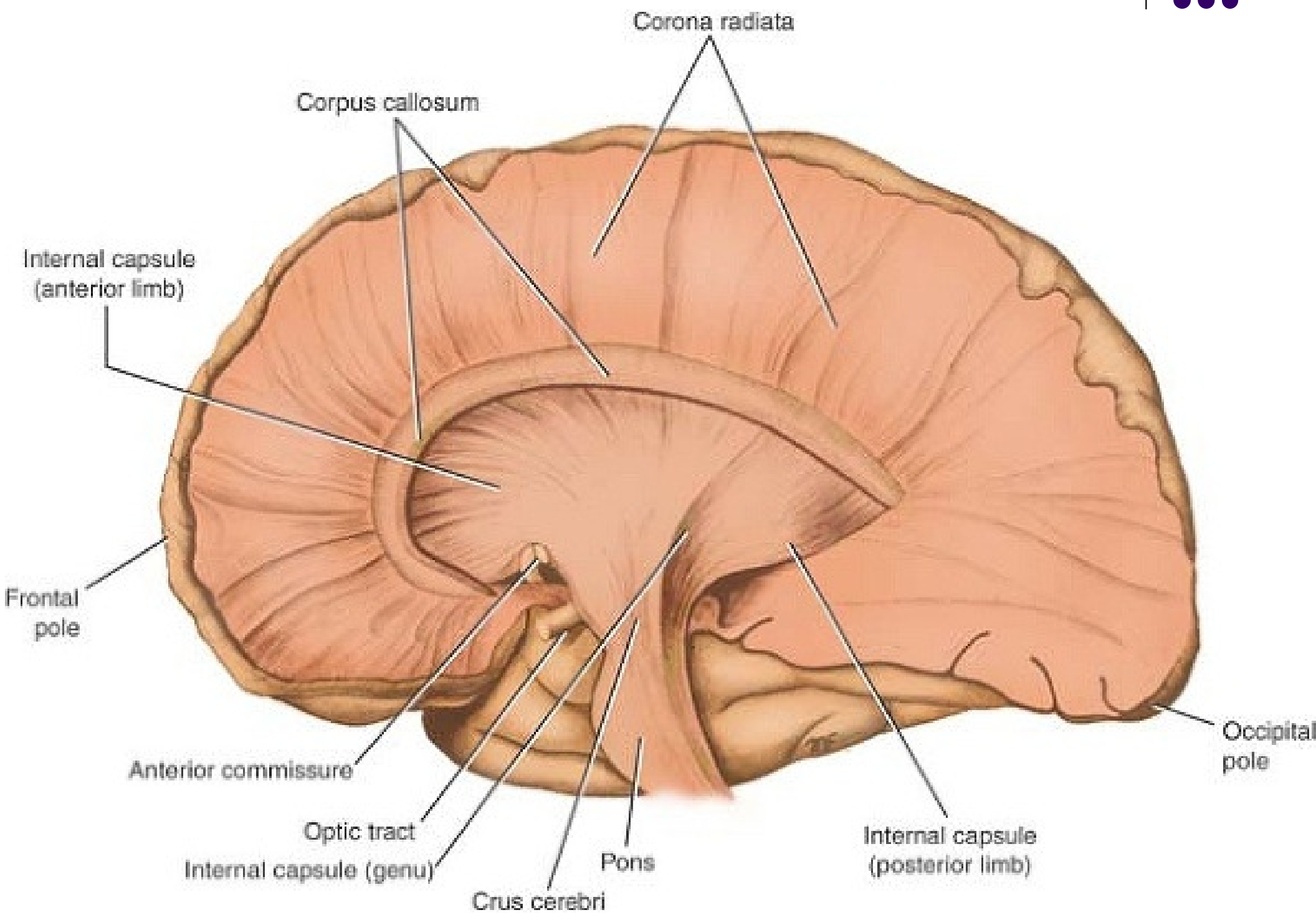
Projection Fibers

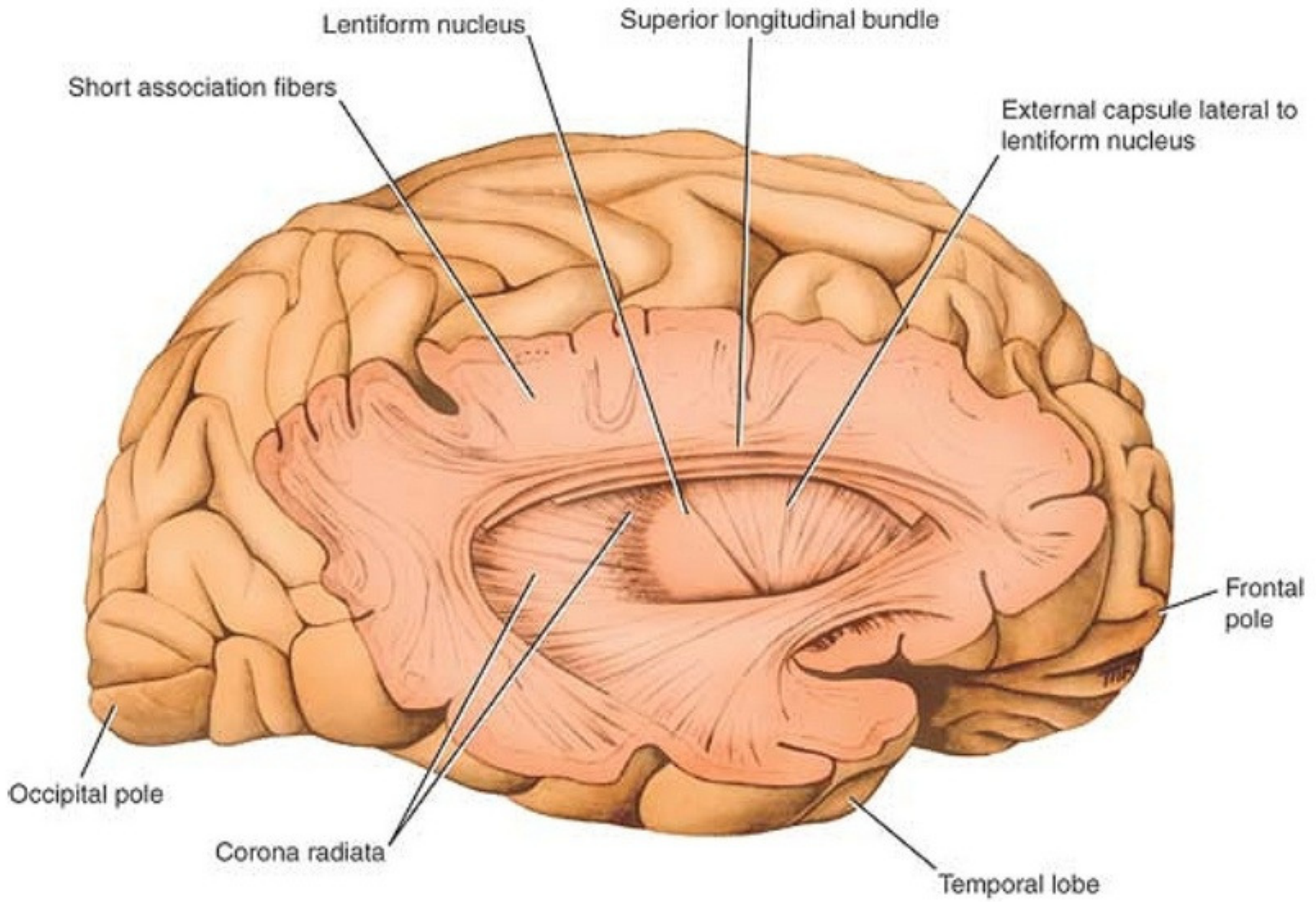
- **Corona radiata:**
fibers
emerging
superiorly
from
between
the nuclear
masses
- **Optic
radiation:**
Most
posterior





Md = Midbrain





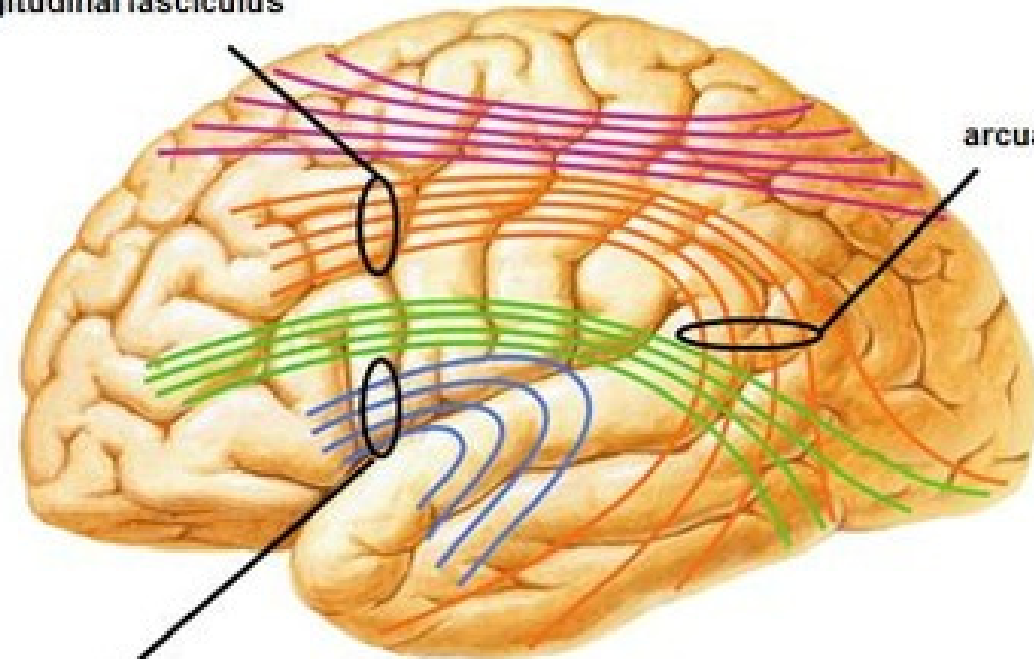
Association Fibers

- **The uncinate fasciculus:** connects the first motor speech area and the gyri on the inferior surface of the frontal lobe with the temporal lobe.
- **Arcuate fasciculus:** sweeps around the insula and connects the speech motor area with the speech comprehension area.

White matter of the cerebral hemispheres

long association fibers

superior longitudinal fasciculus

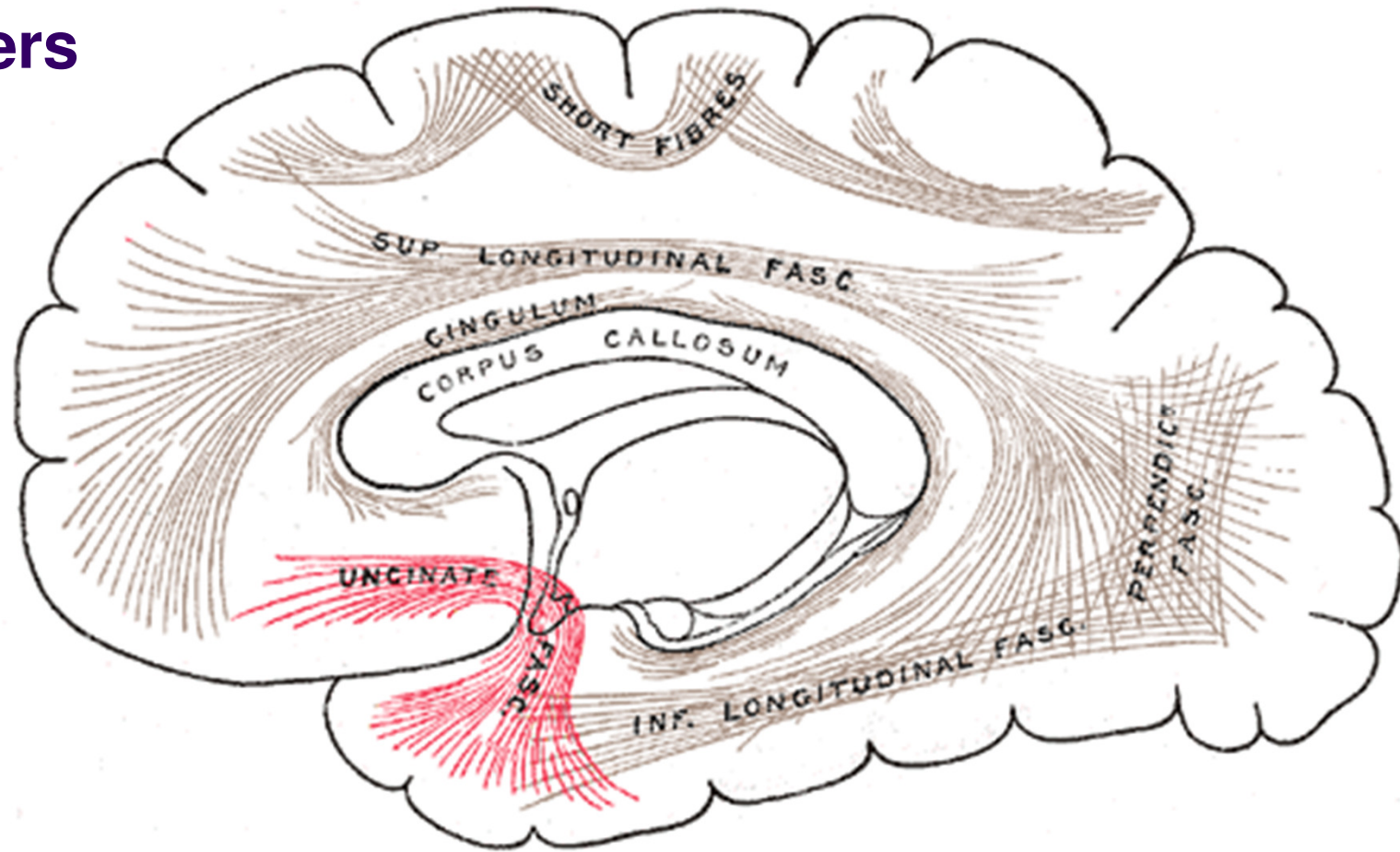


arcuate fasciculus

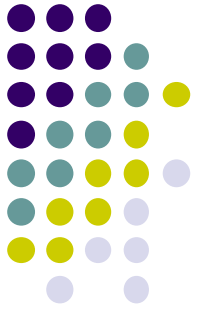
uncinate fasciculus

Association Fibers

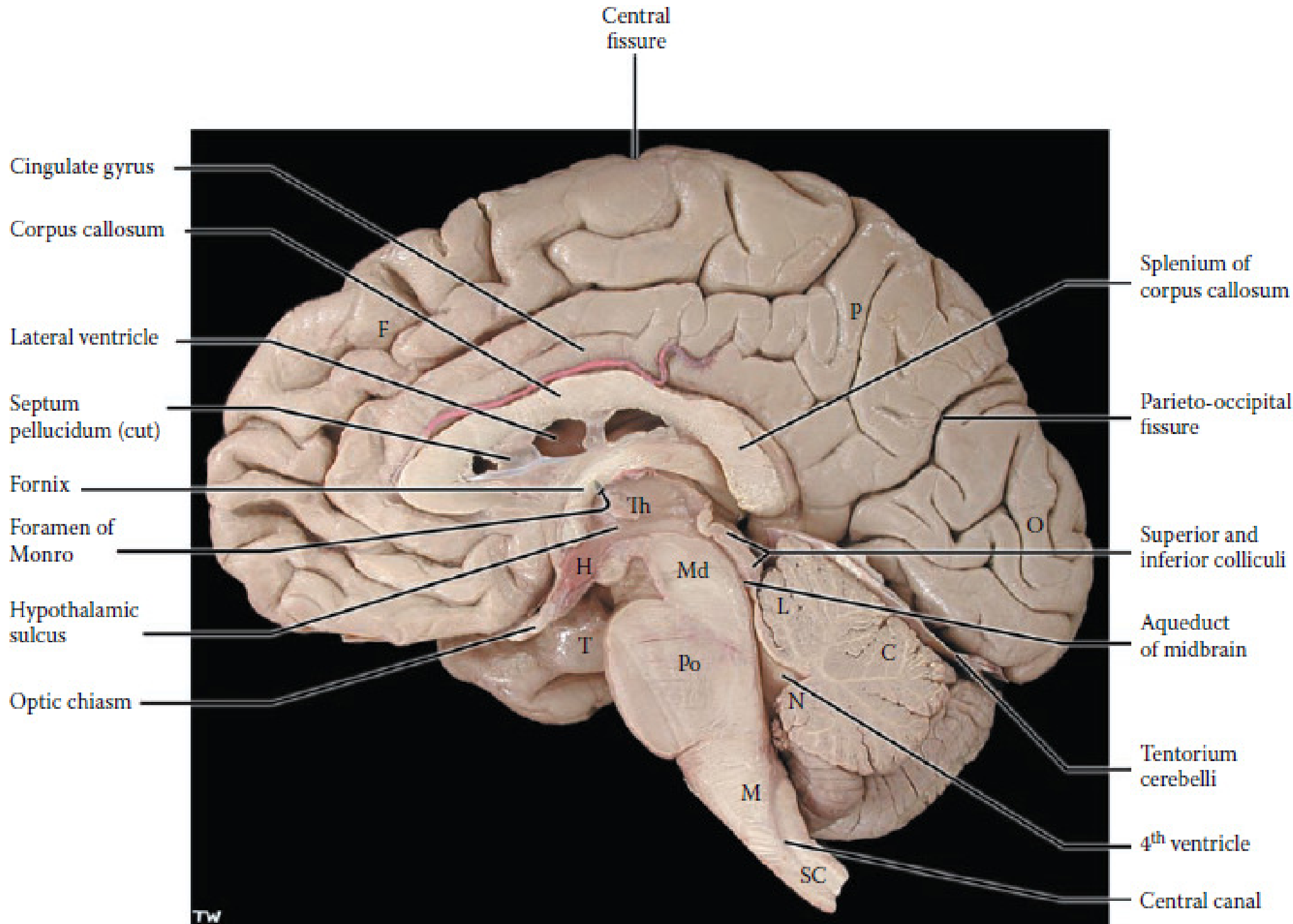
- **The superior longitudinal fasciculus:** connects the anterior part of the frontal lobe to the occipital and temporal lobes.
- **The inferior longitudinal fasciculus:** from the occipital lobe, passing lateral to the optic radiation, and is distributed to the temporal lobe.

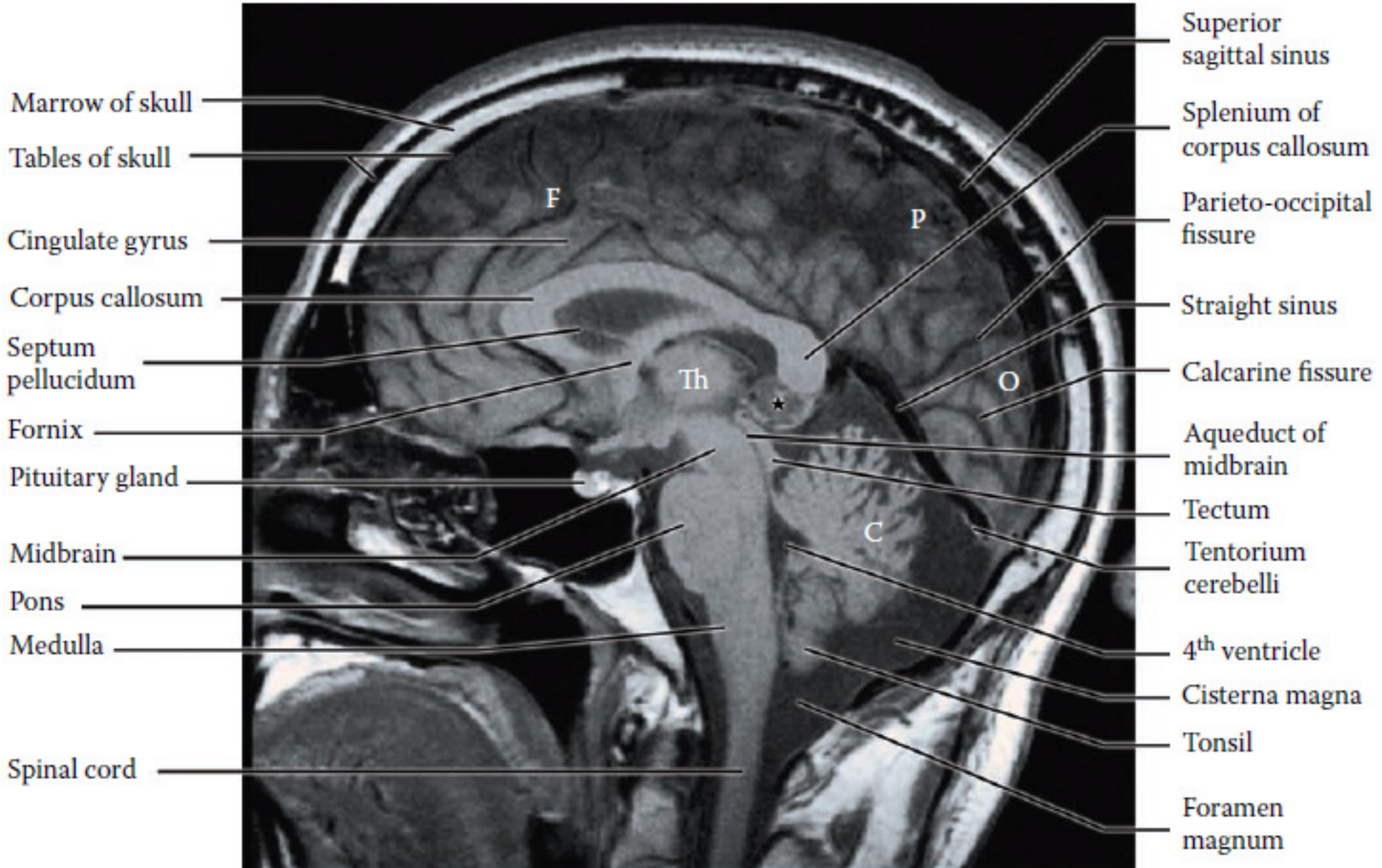


- **Short association fibers:** lie immediately beneath the cortex and connect adjacent gyri
- **The cingulum:** connects the frontal and parietal lobes with parahippocampal and adjacent temporal cortical regions



Sectional anatomy of brain





Marrow of skull

Tables of skull

Cingulate gyrus

Corpus callosum

Septum pellucidum

Fornix

Pituitary gland

Midbrain

Pons

Medulla

Spinal cord

Superior sagittal sinus

Splenium of corpus callosum

Parieto-occipital fissure

Straight sinus

Calcarine fissure

Aqueduct of midbrain

Tectum

Tentorium cerebelli

4th ventricle

Cisterna magna

Tonsil

Foramen magnum

F

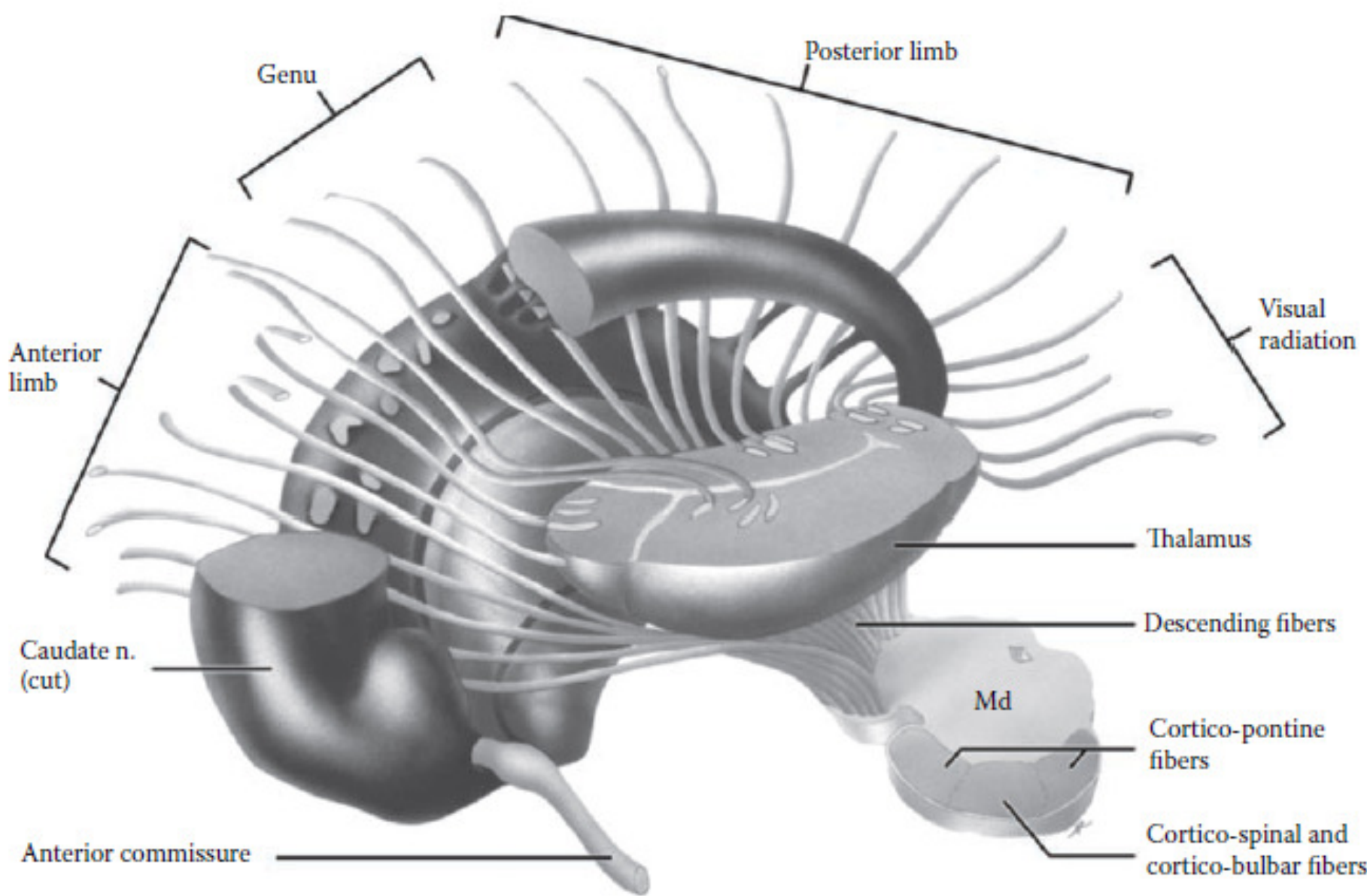
P

Th

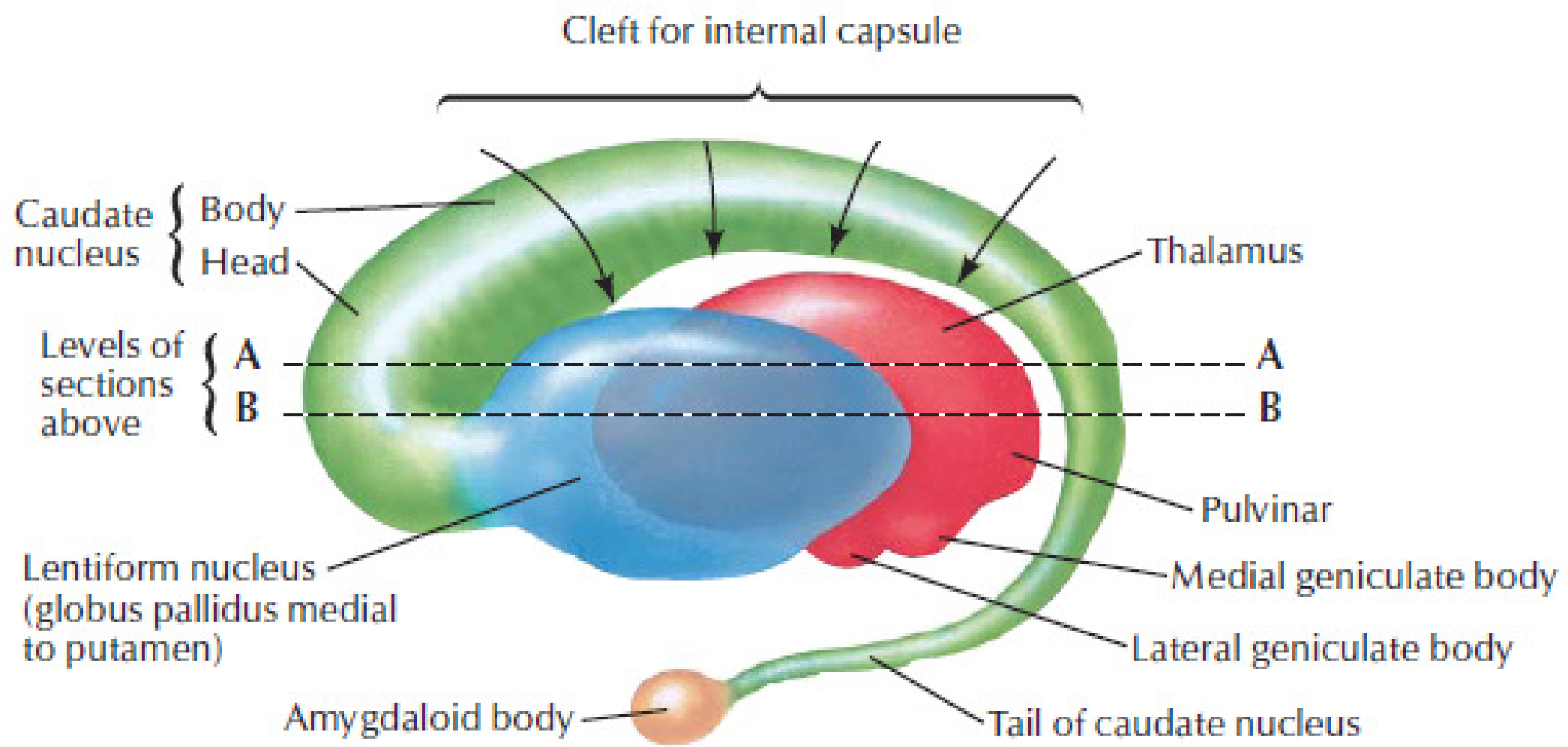
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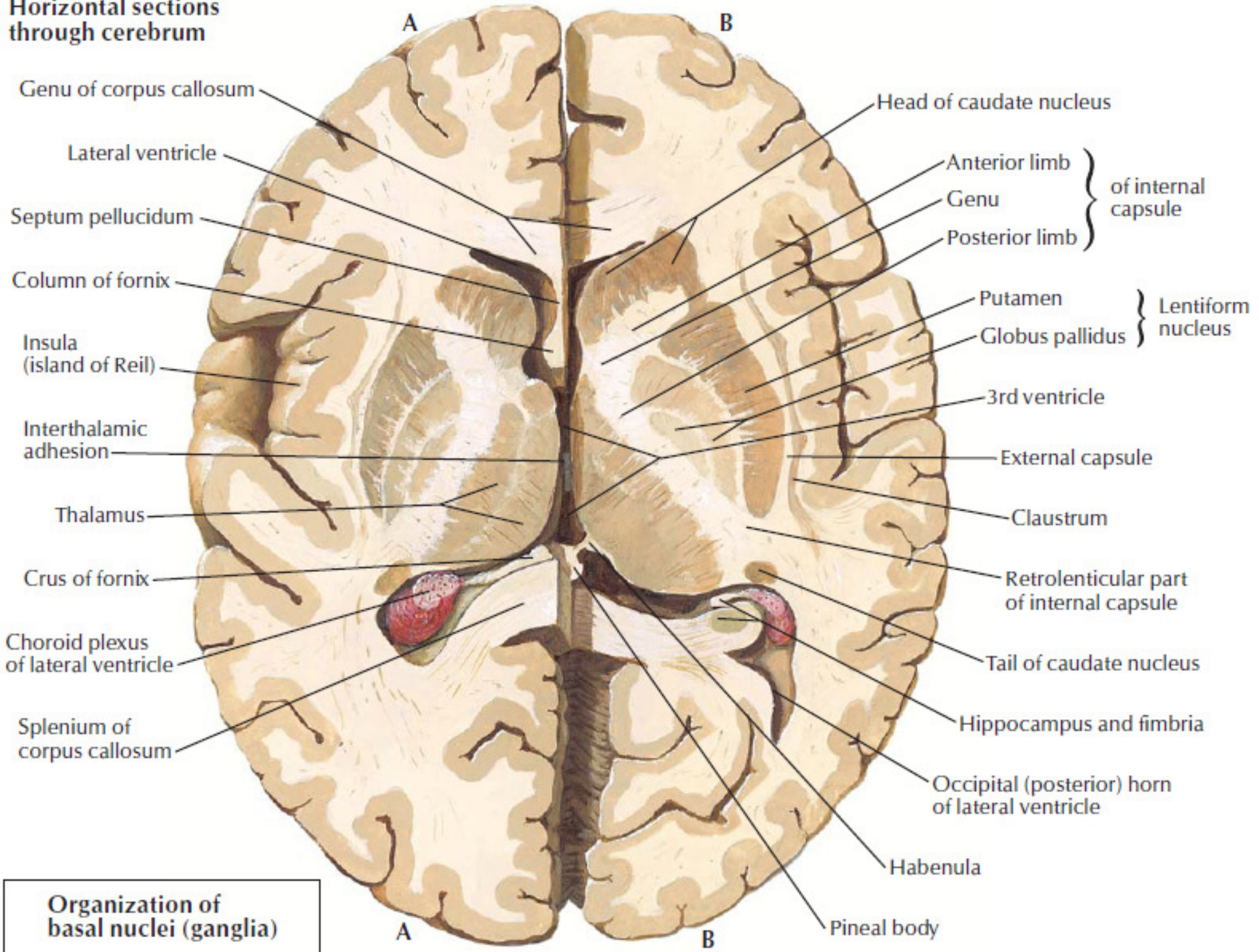
*



Md = Midbrain



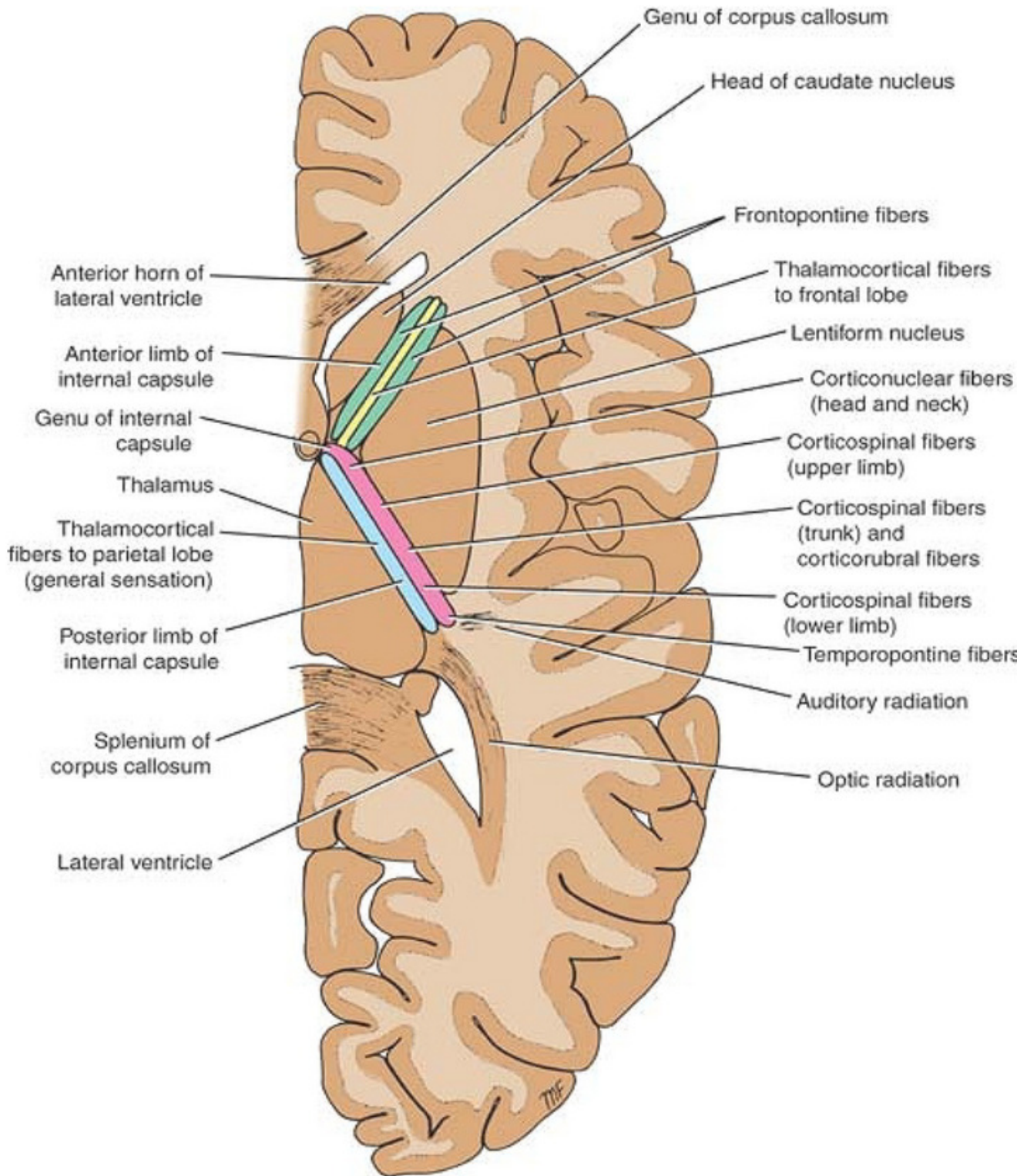
Horizontal sections through cerebrum

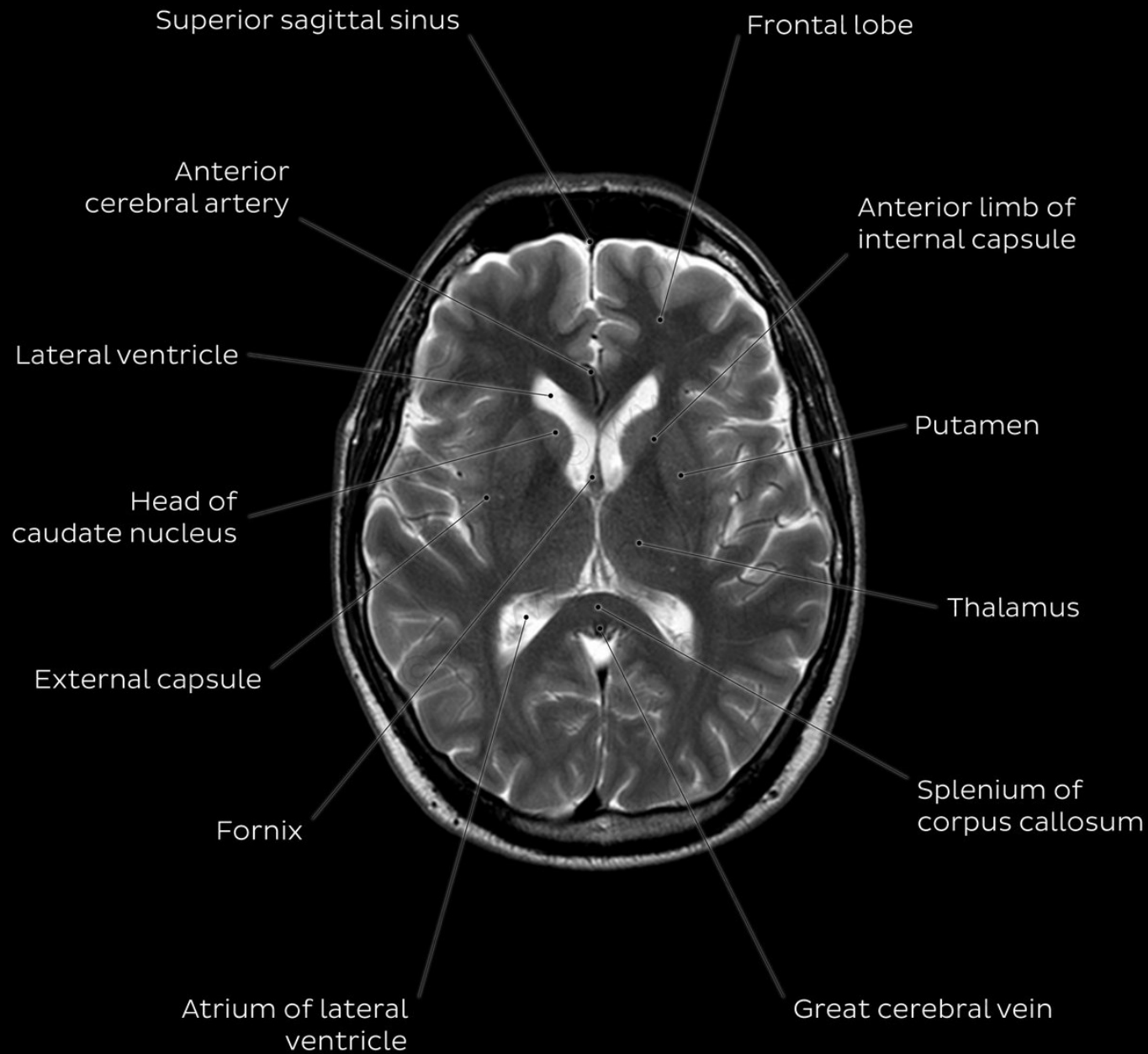
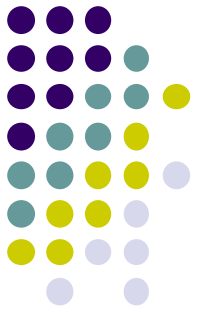


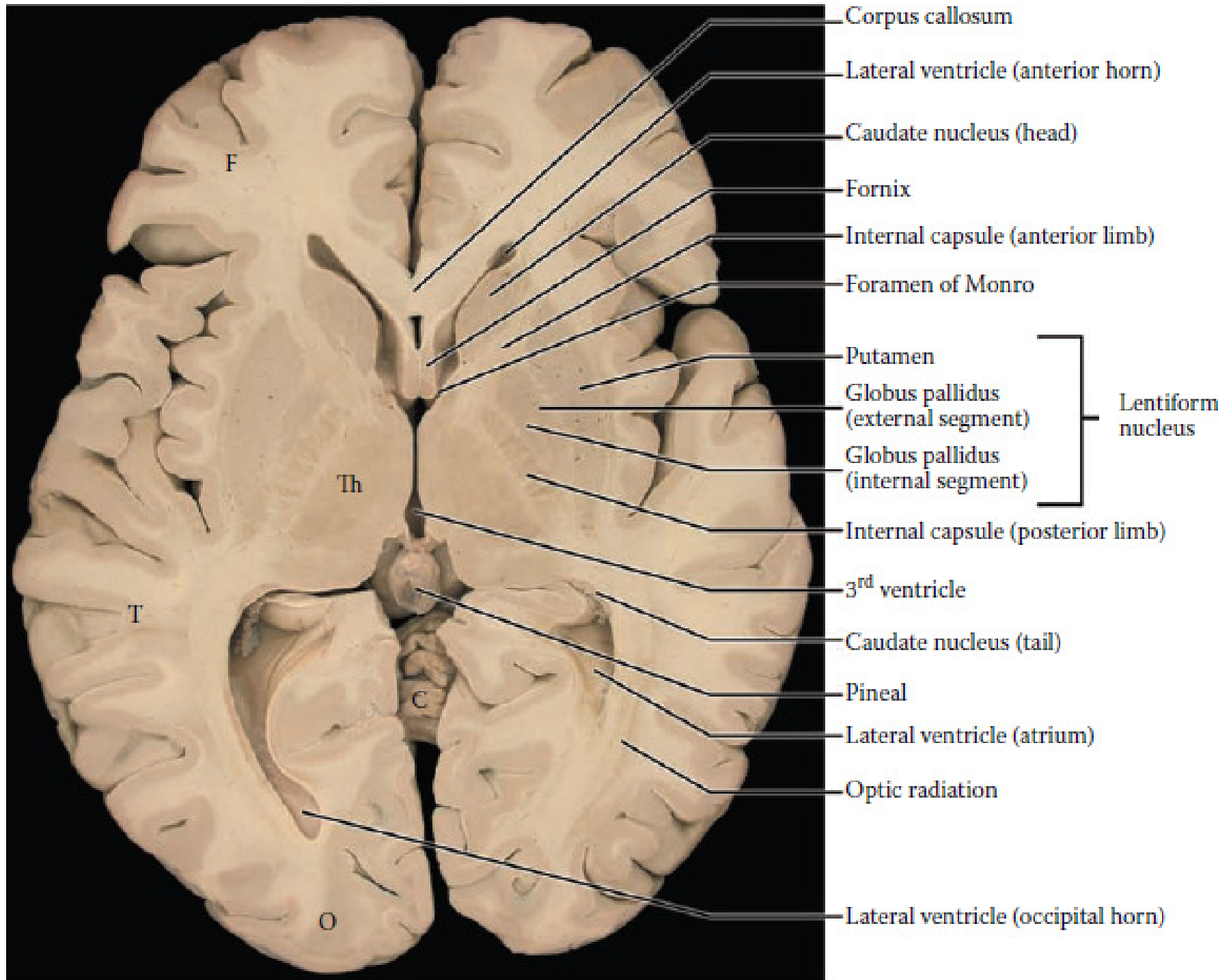
Organization of basal nuclei (ganglia)

Projection Fibers

- Passing to and from the brainstem to the entire cerebral cortex
- **Internal capsule:**
 - **Anterior limb**
 - **Posterior limb**
 - **Genu**
- Medially: caudate nucleus and the thalamus
- Laterally: the lentiform nucleus









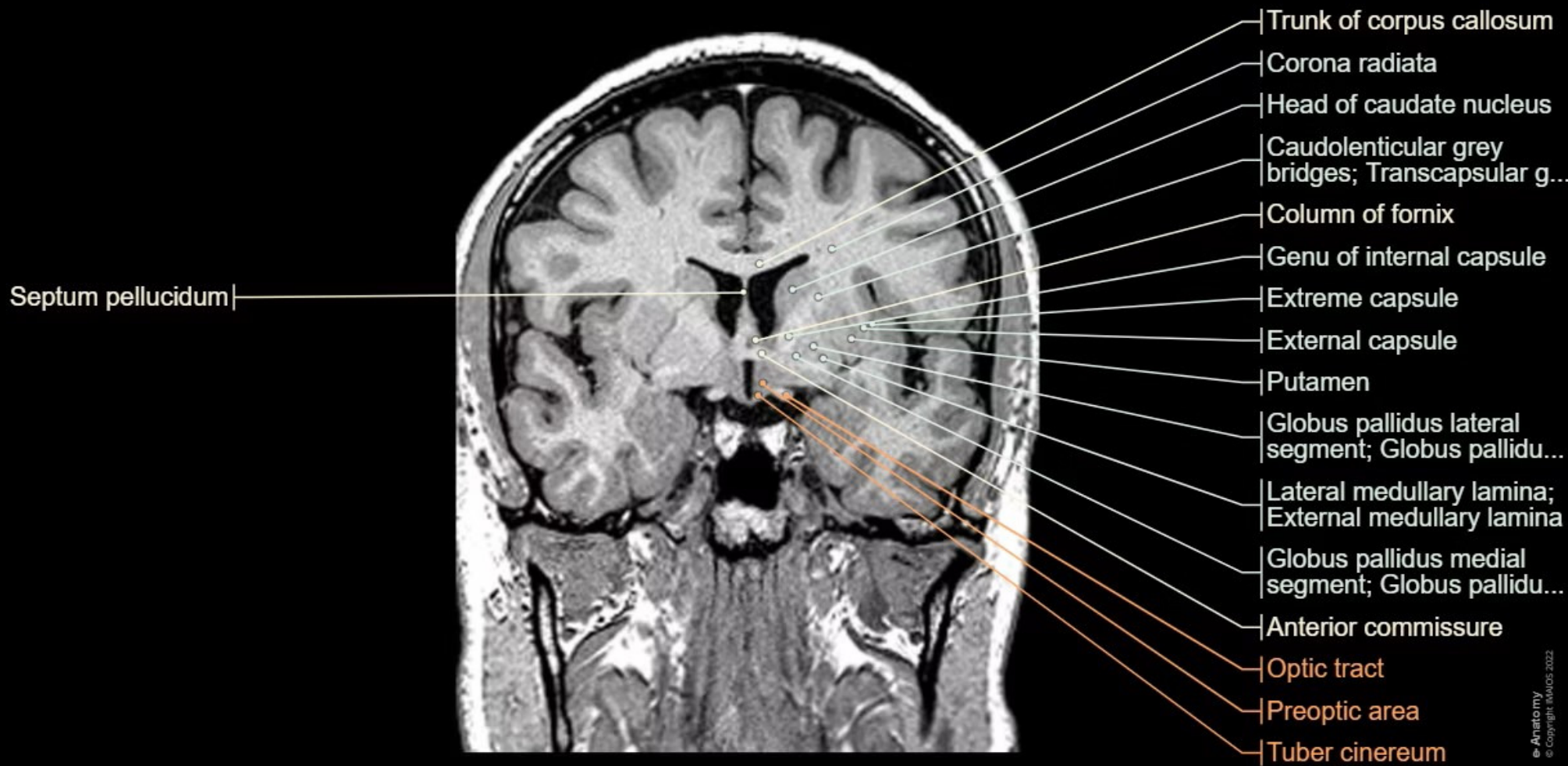
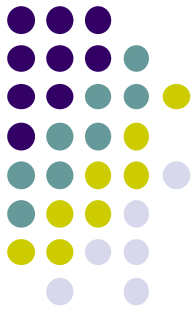
F = Frontal lobe
 T = Temporal lobe

Lat = Lateral fissure
 Ins = Insula

Th = Thalamus

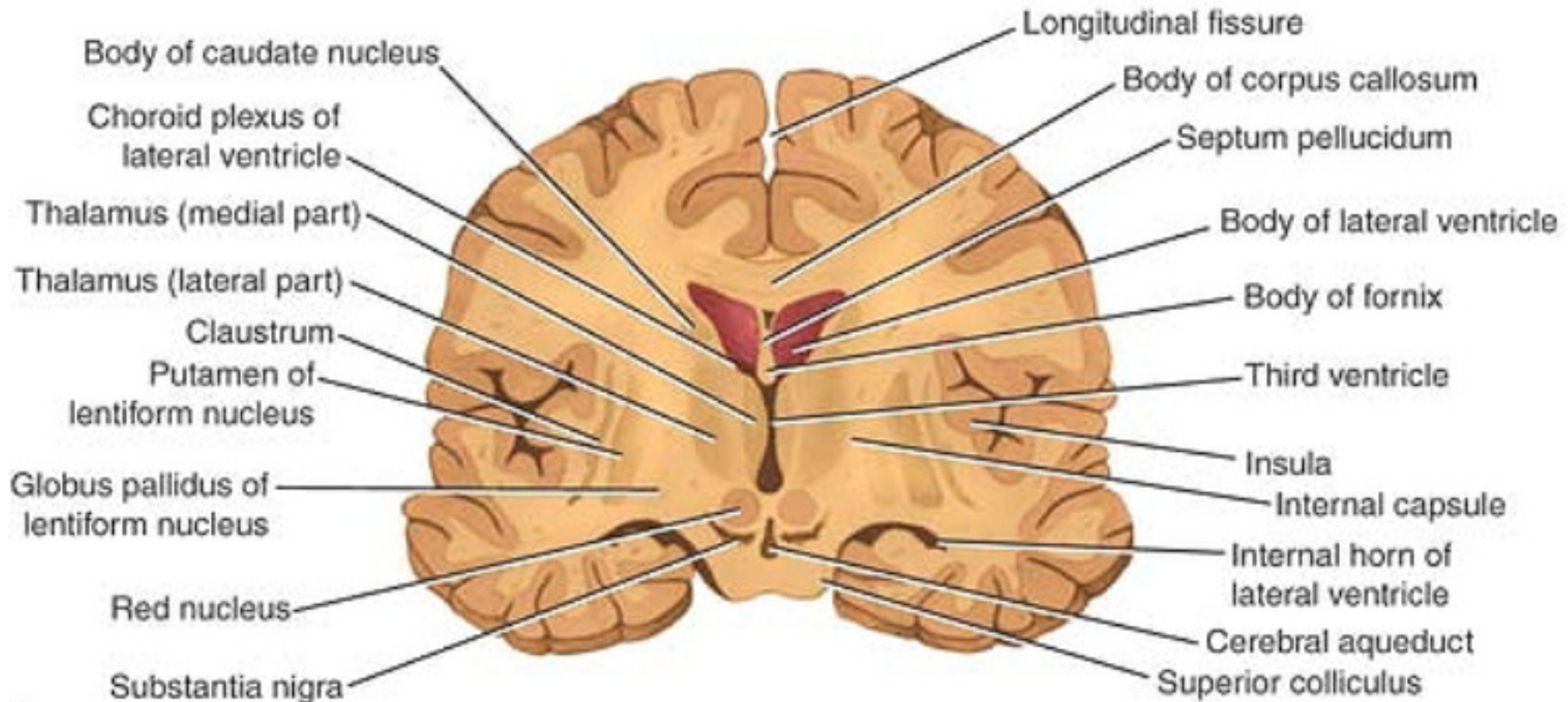
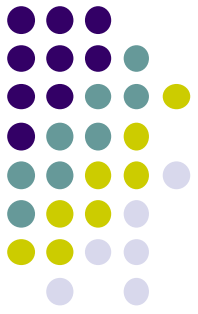
A = Amygdala

Po = Pons



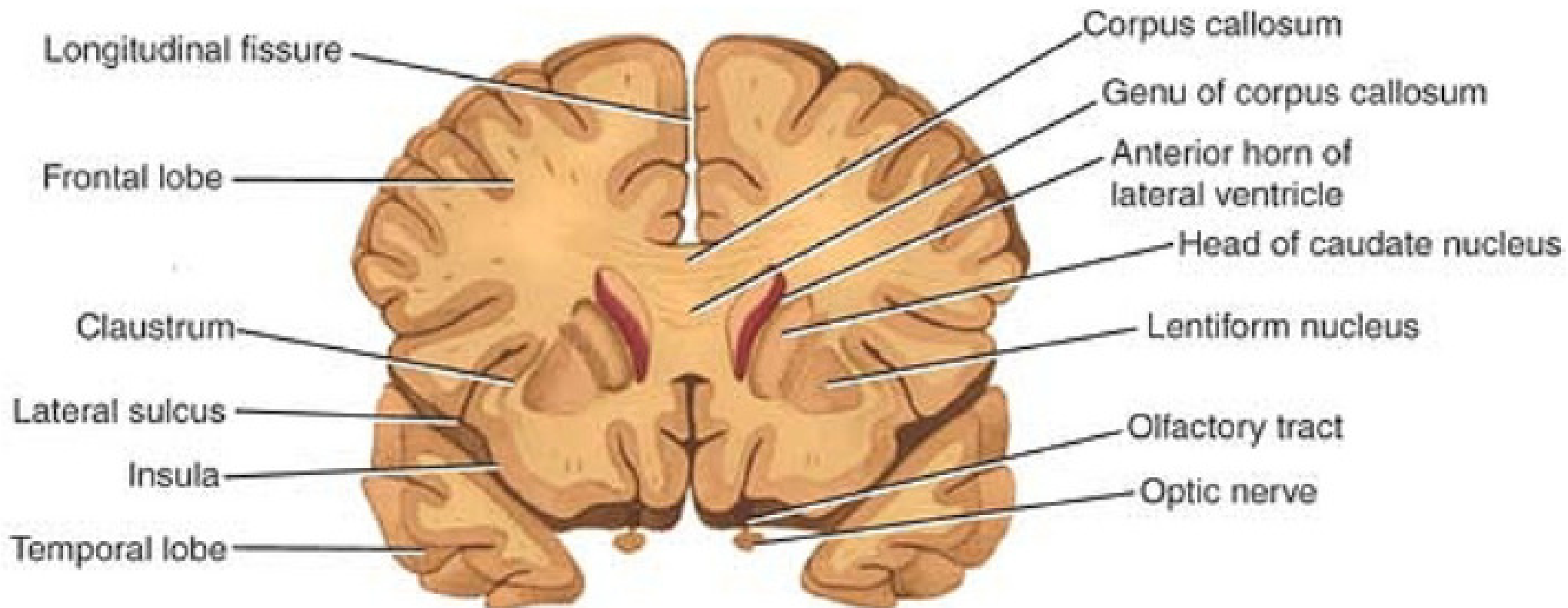
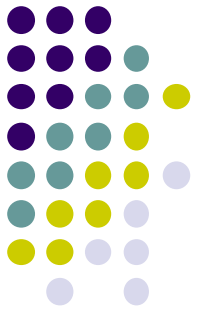
The body of the lateral ventricle

- Extends from the interventricular foramen to the posterior end of the thalamus
- **Roof:** undersurface of the corpus callosum
- **Floor:** body of the caudate nucleus and the lateral margin of the thalamus
- **Medial wall** septum pellucidum



Anterior horn of the lateral ventricle

- Anterior end: frontal lobe
- Posterior end: continuous with the body of the ventricle
- **Roof:** anterior part of the corpus callosum
- **Floor:** head of the caudate nucleus
- **Medial wall:** superior surface of the rostrum of the corpus callosum, septum pellucidum and the anterior column of the fornix



Posterior horn of the lateral ventricle

- Anterior end: continuous with the body of the ventricle
- Posterior end: occipital lobe
- **Roof and lateral wall** : tapetum of the corpus callosum
- **Medial wall:**
 - Superior: splenial fibers of the corpus callosum, forceps major (bulb of the posterior horn)
 - Inferior: **calcar avis**

