

Association and Projection White Fiber (WHITE MATTER)

By

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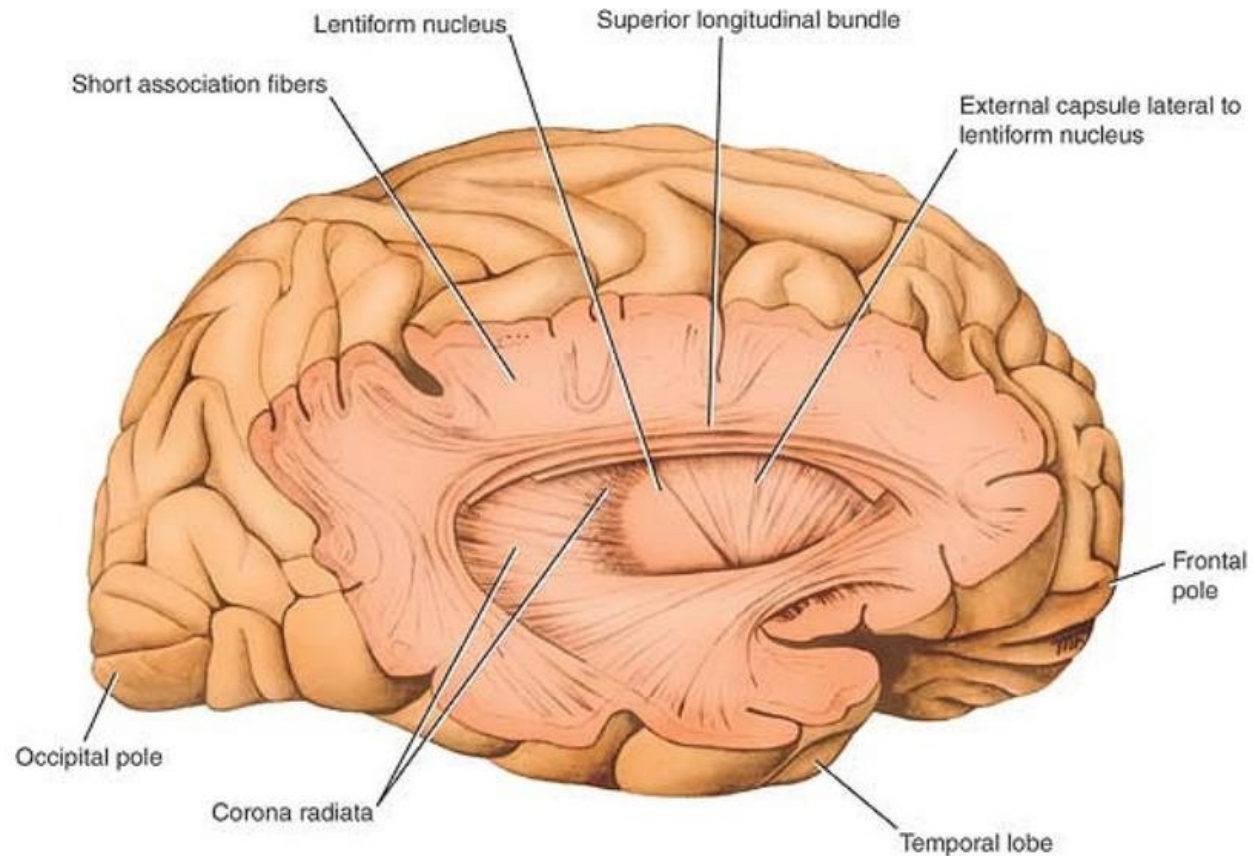
A/P Anatomy dept kgmc

Association Fibers

- These are nerve fibers
- That connect various cortical regions within the same hemisphere
- And divided into **short and long groups**

Short association.

- Fibers lie immediately beneath the cortex
- And connect adjacent gyri



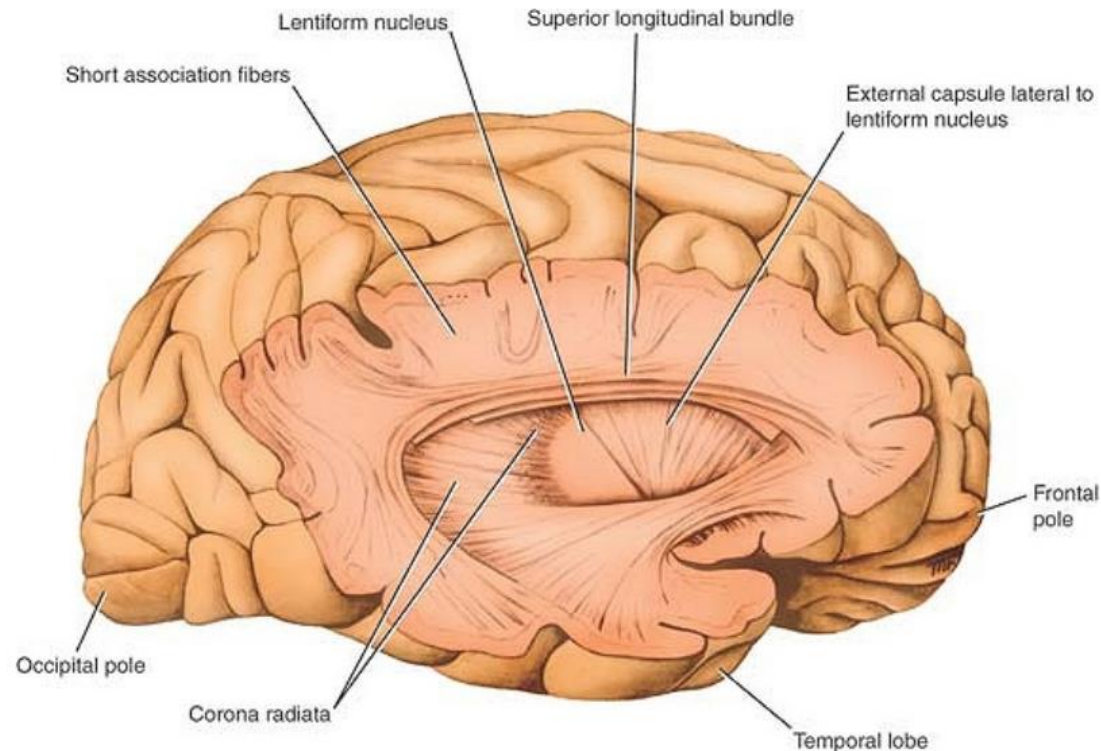
Association Fibers

long association fibers

- Are collected into their own named bundles
- That can be dissected in a formalin-hardened brain.

Uncinate fasciculus

- Connects the first motor speech area
- And the gyri on the inferior surface of the frontal lobe with the cortex of the pole of the temporal lobe.

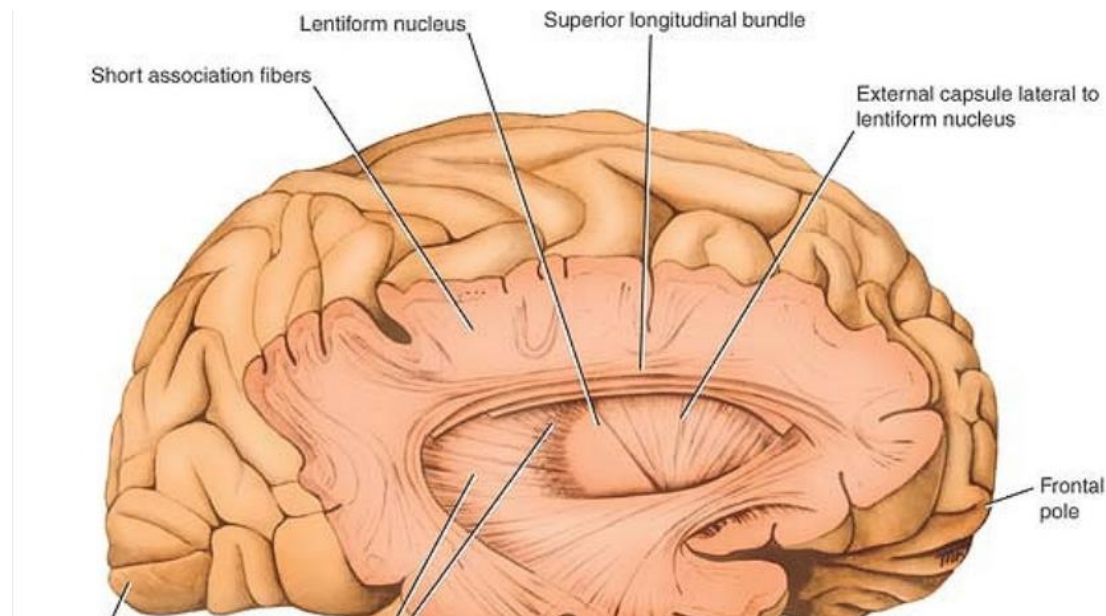


Cingulum fasciculus is a long, curved lying within the white matter of the **cingulate gyrus**.

- It connects the frontal and parietal lobes with parahippocampal and adjacent temporal cortical regions.

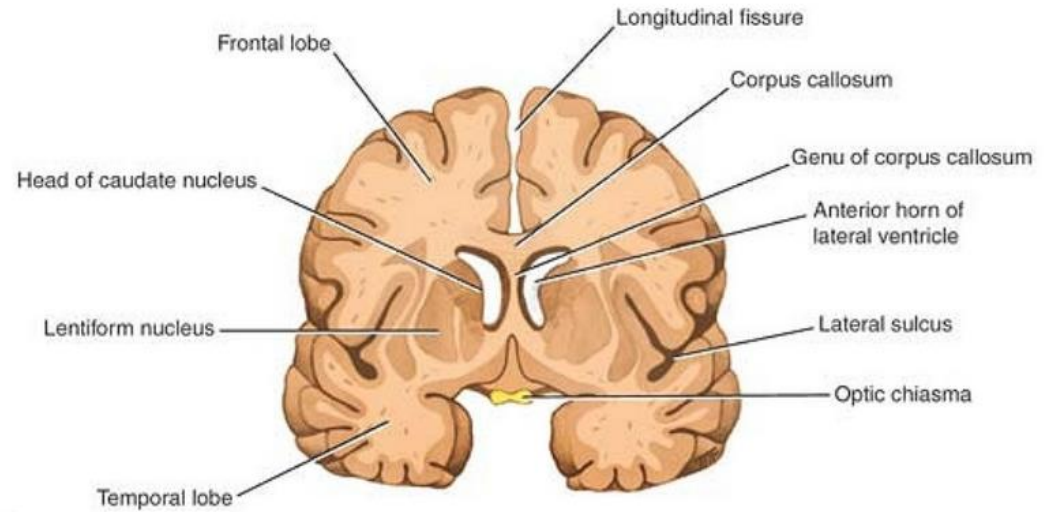
Superior longitudinal fasciculus

- Is the largest bundle of nerve fibers.
- It connects the anterior part of the frontal lobe to the occipital and temporal lobes.

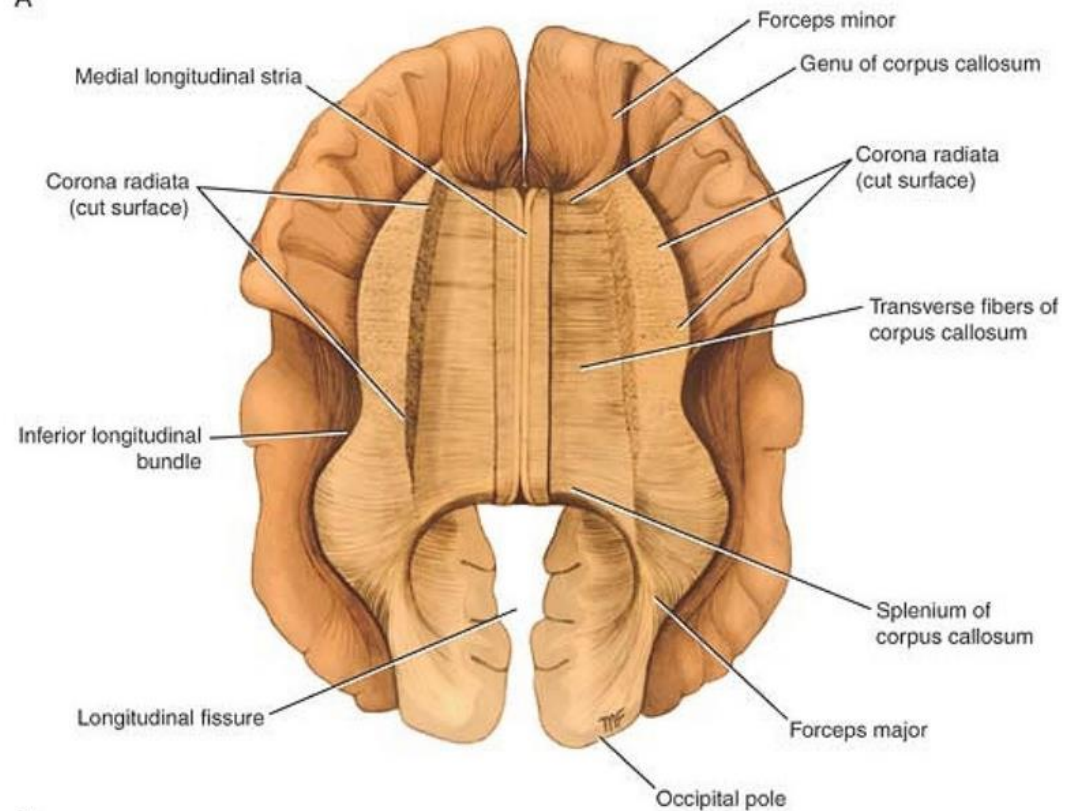


Inferior longitudinal fasciculus

- Runs anteriorly from the occipital lobe
- Passing lateral to the optic radiation
- And is distributed to the temporal lobe.



A



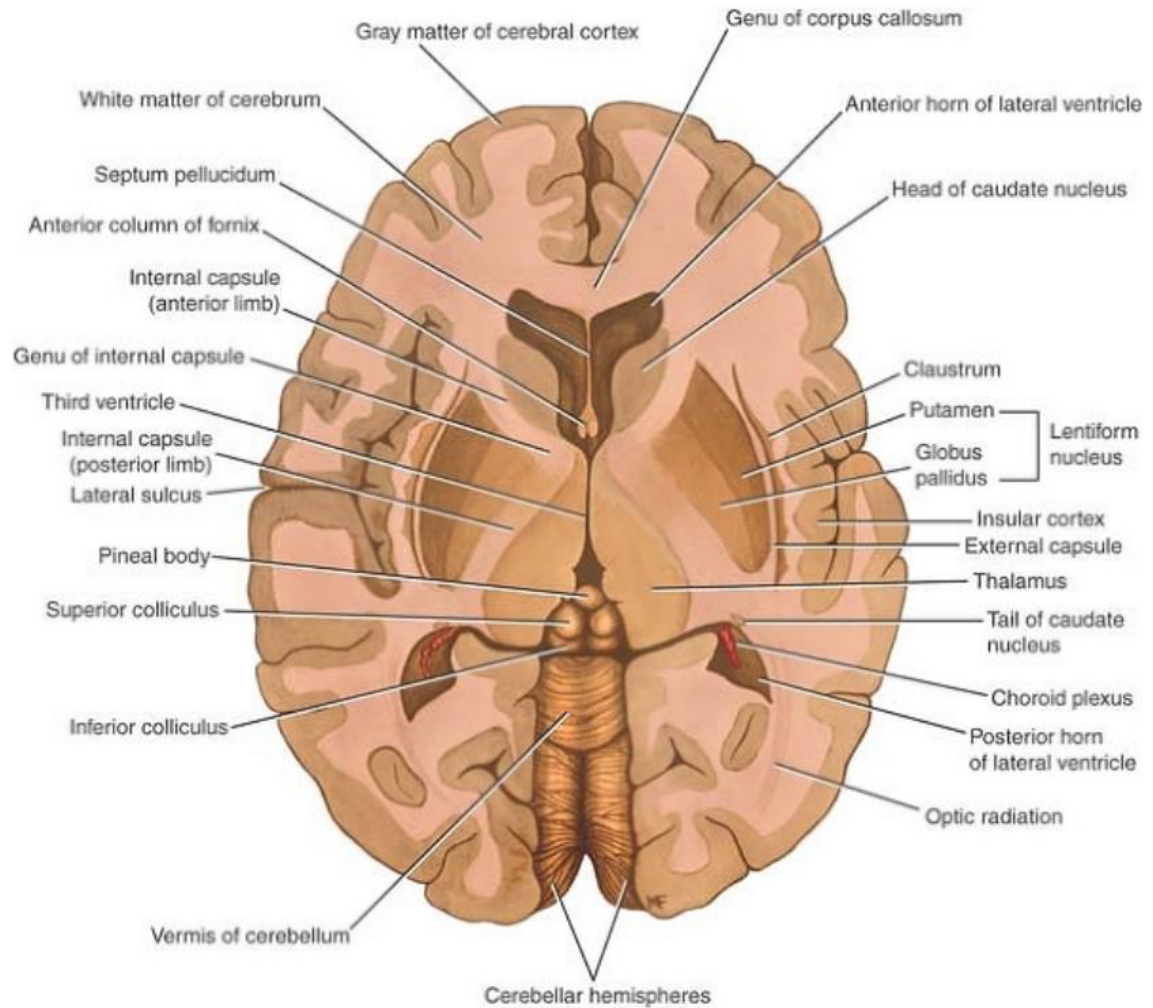
B

Fronto-occipital fasciculus

- It is situated deep within the cerebral hemisphere and is related to the lateral border of the caudate nucleus.
- Connects the frontal lobe to the occipital and temporal lobes.

Projection Fibers

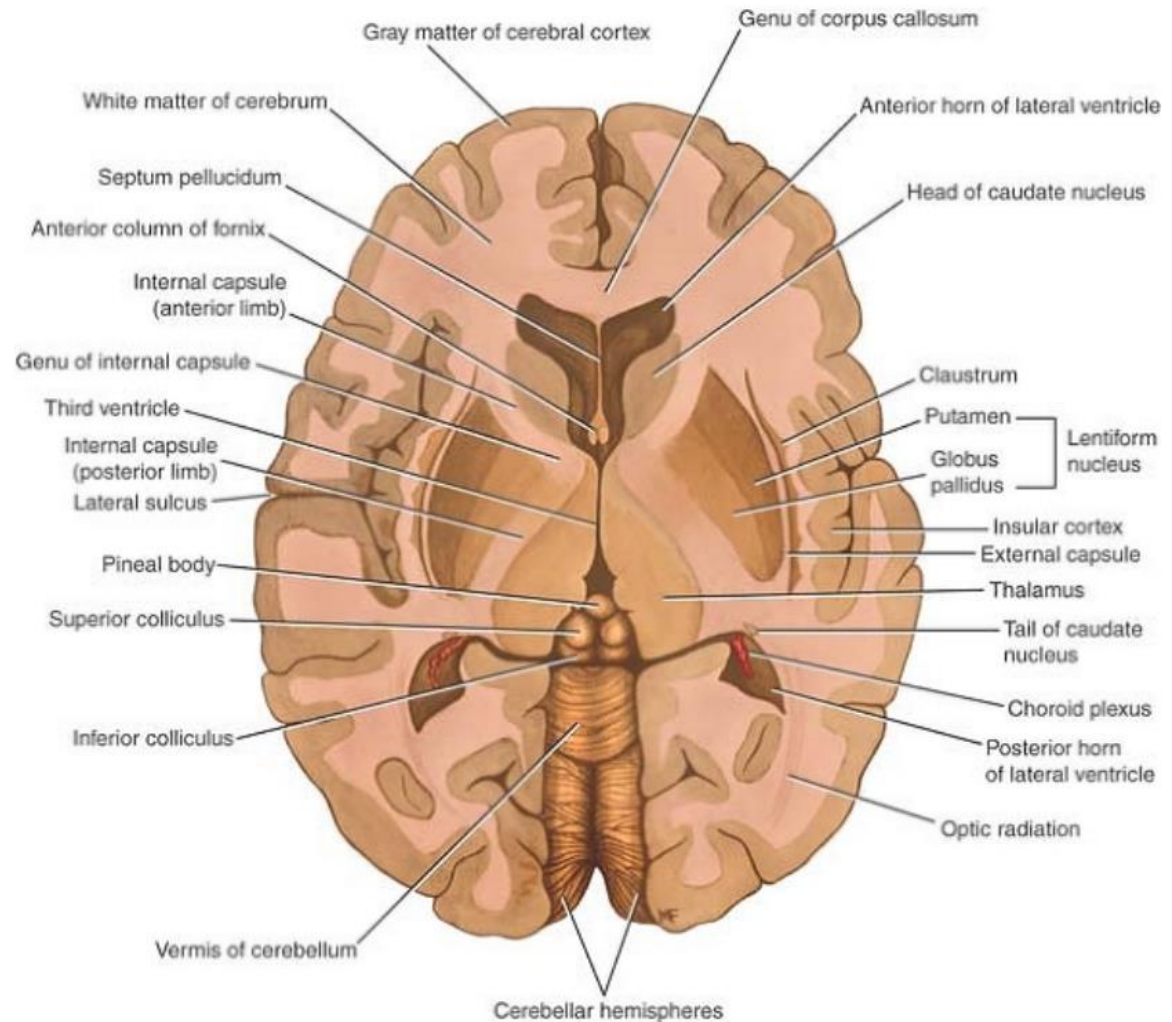
- Afferent and efferent nerve fibers passing to and from the brainstem to the entire cerebral cortex
- Must travel between large nuclear masses of gray matter within the cerebral hemisphere.



Projection Fibers

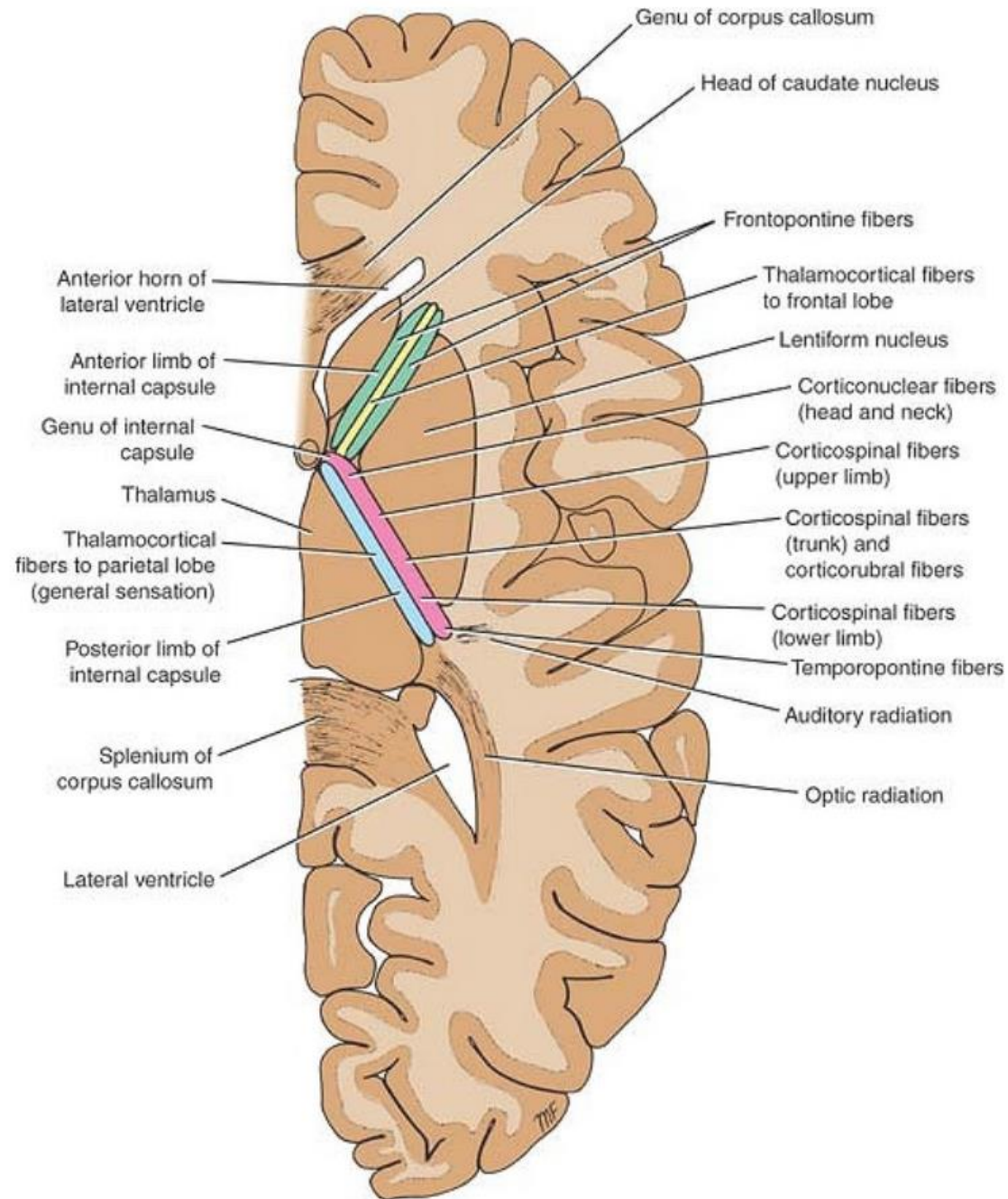
At the upper part of the brainstem

- These fibers form a compact band known as the **internal capsule**
- Which is flanked medially by the caudate nucleus and the thalamus and laterally by the lentiform nucleus .



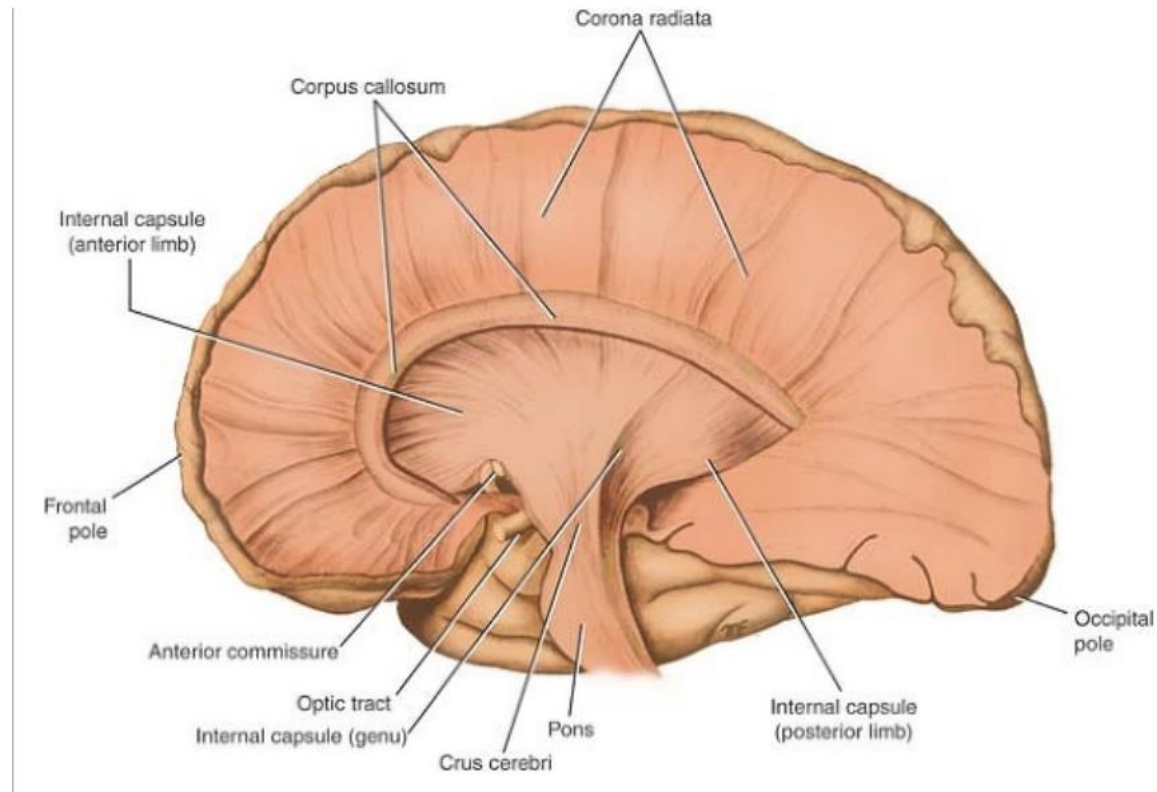
Projection Fibers

- Because of the wedge shape of the lentiform nucleus, as seen on horizontal section
- Internal capsule is bent to form an anterior limb and a posterior limb
- which are continuous with each other at the genu .



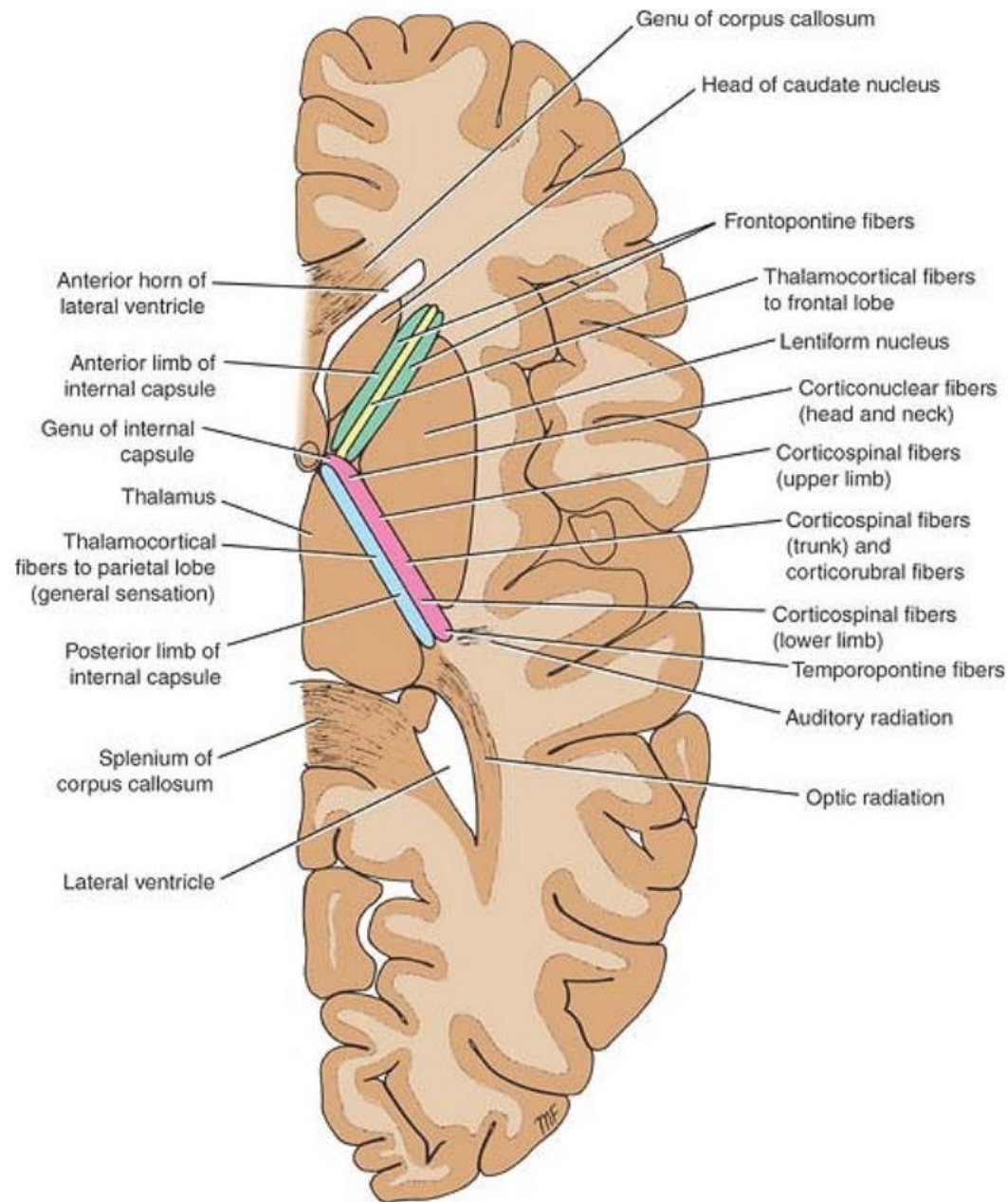
Projection Fibers

- Once the nerve fibers have emerged superiorly from between the nuclear masses
- They radiate in all directions to the cerebral cortex.
- These radiating projection fibers are known as the corona radiata .



Projection Fibers

- Most of the projection fibers lie medial to the association fibers
- But they intersect the commissural fibers of the corpus callosum and the anterior commissure.
- The nerve fibers lying within the most posterior part of the **posterior limb of the internal capsule radiate** toward the calcarine sulcus and are known as **the optic radiation**.



CASE PRESENTATION

- A 23-year-old man was referred to a neurologist because of intermittent attacks of headaches, dizziness, and weakness and numbness of the left leg.
- On close questioning, the patient admitted that the headache was made worse by changing the position of his head.
- A computed tomography (CT) scan revealed a small white opaque ball at the anterior end of the third ventricle.
- A diagnosis of a colloid cyst of the third ventricle was made.
- The aggravation of the headache caused by changing the position of the head could be explained by the fact that the cyst was mobile and suspended from the choroid plexus.

- When the head was moved into certain positions, the ball-like cyst blocked the foramen of Monro on the right side
- Further raising the intracerebral pressure and increasing the hydrocephalus.
- The weakness and numbness of the left leg were due to pressure on the right thalamus
- And the tracts in the right internal capsule, produced by the slowly expanding tumor.
- The patient made a complete recovery after surgical excision of the tumor.



Thank you!

