WHITE MATTER of CEREBRUM

1) axons 2) glia 3) blood vessels

- embriogenezėje traktai įauga ir mielinizuojasi tam tikra seka (vėliausiai susiformuoja tr. pyramidalis) (NA)-341 (lentelė)

- white matter aksonai sudaro:
  1) association pathways
  2) commissures
  3) projection pathways
  4) thalamic peduncles
  5) capsules (internal, external, extreme)

- aksonai, kurių perikarya esti žievėje, sudaro: (NA)-341

(1) ASSOCIATION fibers – synapse on IPSILATERAL cortical neurons

(2) COMMISSURAL fibers – synapse on CONTRALATERAL cortical neurons

(3) PROJECTION fibers – synapse on INFRACORTICAL neurons

- any given axon may branch to send collateral fibers to association, commissural, projection pathways

PROJECTION fibers may end:

a) ipsilaterally
b) contralaterally (decussating fibers)

Fibers that cross midline:

a) COMMISSURAL fibers – – connect mirror-image points
b) DECUSSATING fibers – – connect non-mirror-image points

ASSOCIATION fibers (NA 342)

- pagal ilgį:
  a) short fibers
  b) intermediate lenght fibers
  c) long fibers

- pagal kryptį:
  a) longitudinal – jungia lobes
  b) transverse – tarp medial ir lateral surfaces
  c) vertical

SHORT FIBERS

- kai kurios labai trumpos ir remain intracortical (do not enter white matter)
- arcuate fibers – connect adjacent gyri – travel around the depth of sulcus (form U-shaped lamina)
- kai kurios demielinizuojančios ligos paliečia long fibers, bet ne arcuate fibers

LONG FIBERS

- kuo ilgesnės skaidulos – tuo jos lamimojasi arčiau centro (peripheral-to-central lamination) – vs. in spinal cord (ilgiausios skaidulos esti labiausiai periferijoje, nes pilkoji medžiaga esti centre!)

- long fibers susideda į FASCICULI:

1) fasciculus uncinatus – jungia frontal lobe su temporal lobe (curving ventrally under sylvian fissure)

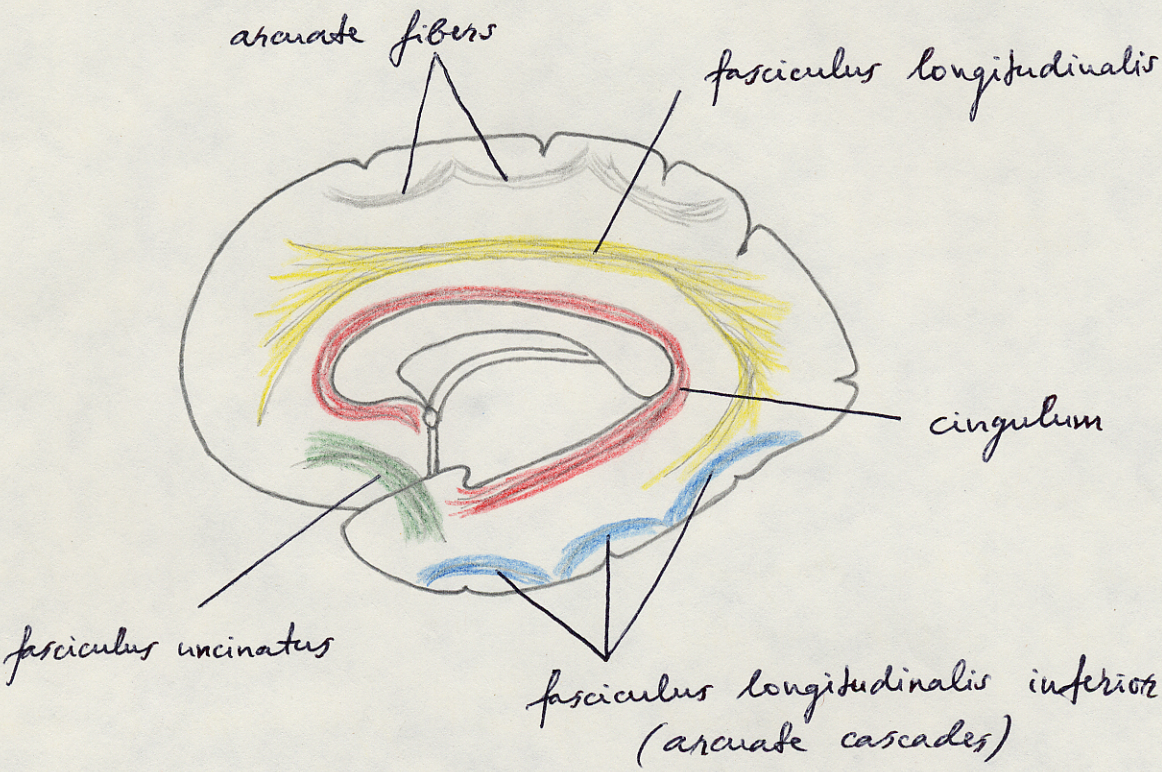
abiejų sinonimai FASCICULUS ARCUATUS

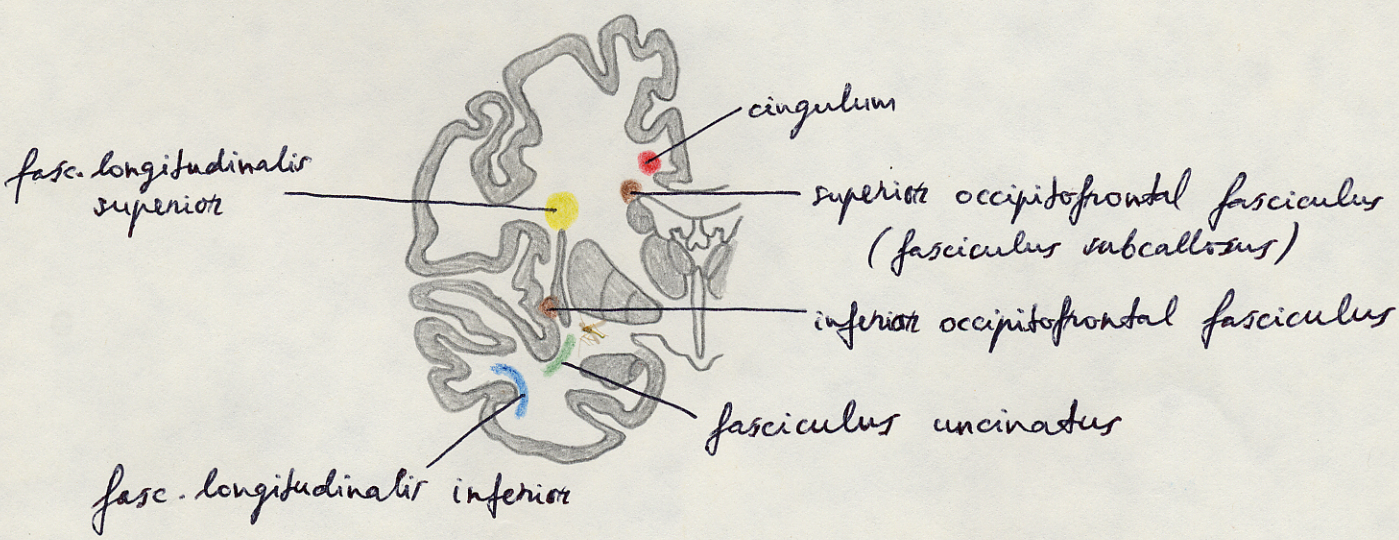
2) fasciculus longitudinalis superior: frontal ↔ occipital, temporal

3) fasciculus longitudinalis inferior: temporal → occipital
(tai arcuate fibers kaskada)

4) 5) fasciculi occipito-frontales superior et inferior: frontal ↔ occipital

Association pathways





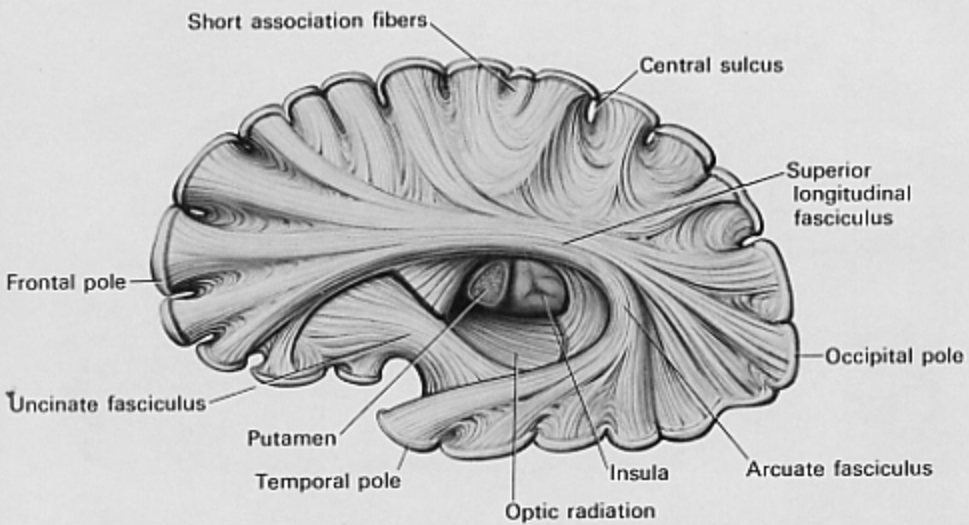


Fig. 2-10. Dissection of the lateral surface of the left hemisphere to display long and short association fibers.

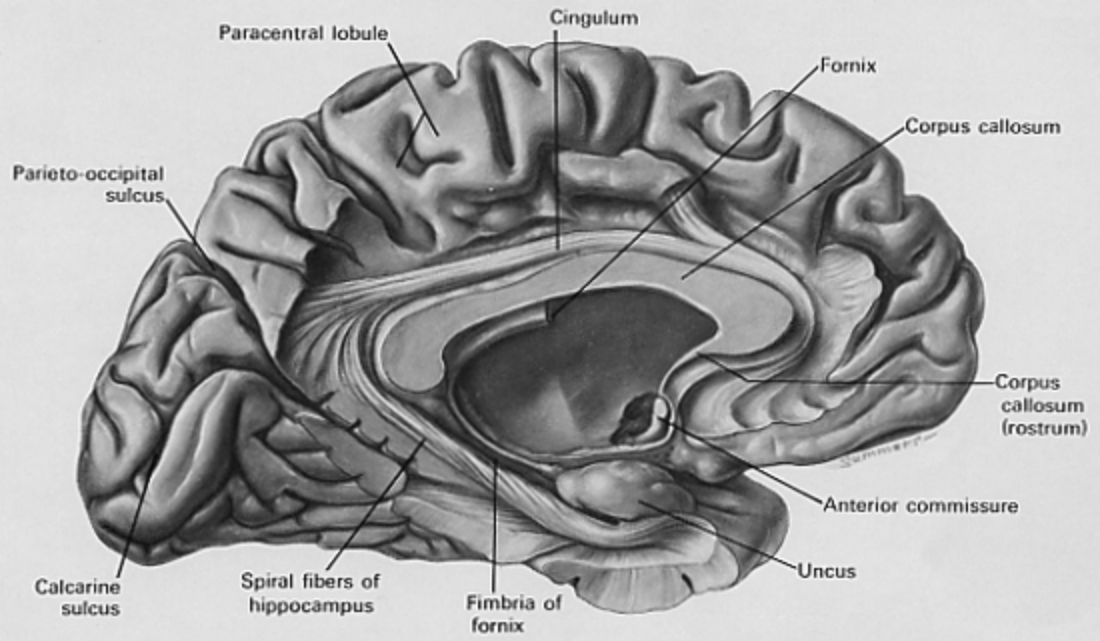


Fig. 2-11. Dissection of the medial surface of the left cerebral hemisphere exposing the cingulum. The diencephalon has been removed (from Mettler's *Neuroanatomy*, 1948; courtesy of The C. V. Mosby Company).

6) cingulum – eina išilgai gyrus cinguli ir gyrus parahippocampalis – association pathway of limbic lobe (fasciculus uncinatus completes limbic ring); be to gauna skaidulas iš limbic nuclei of thalamus; dalis skaidulų per corpus callosum (dorsal and ventral lamina) pereina į kitą pusę, projektuojasi į corpus striatum (NA) 344

Stereotactic CINGULOTOMY:

a) reduces reactions to pain (beviltiškiems ligoniams)

b) reduces intensity of obsessive-compulsive neuroses

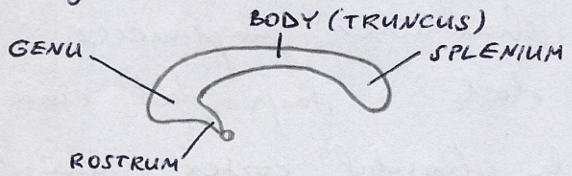
CAPSULA EXTERNA, CAPSULA EXTREMA – praeina įv. krypčių skaidulos; no known clinical syndrome results from lesions of external and extreme capsules and claustrum

COMMISSURES

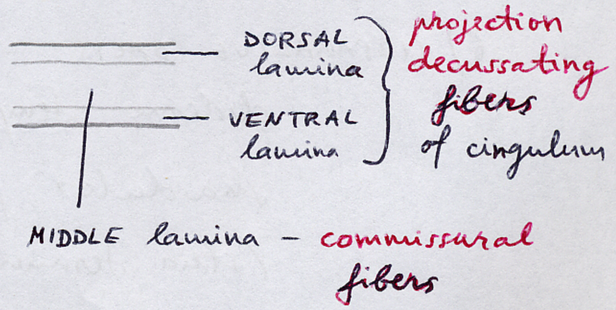
CORTICAL COMMISSURES

1) corpus callosum

in sagittal section:



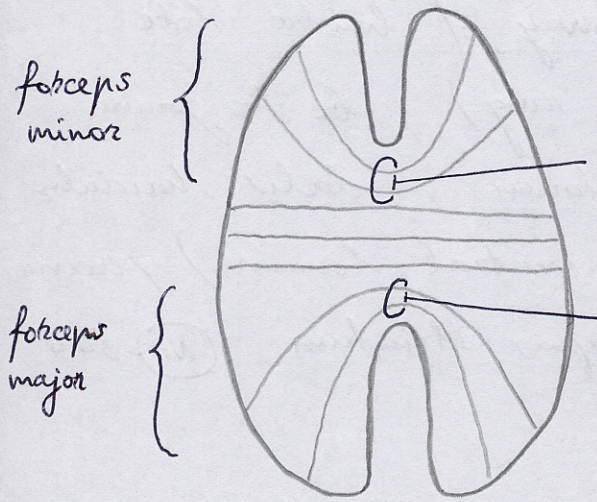
in frontal section:



 CEREBRUM – white matter

in horizontal section (middle lamina):

baltoji medžiaga horizontaliame pjūvyje – – centrum semiovale



skaidulos iš corpus callosum radijuojančios į žievę – – radiatio corporis callosi

corpus callosum skaidulos sudaro plokštelę šon. skilvelio temporal ir occipital horns šoninėje sienelėje – tapetum

regions that lack transcallosal connections:

1) dalis frontal cortex
2) didesnė dalis temporal cortex } jungiasi per ant. commissure!
3) primary sensory cortex (areas 1, 2, 17, 41)
4) galūnių motor cortex

• pasitaiko corpus callosum agenezija

2) commissura fornicis (s. commissura hippocampi, psalterium) jungia abiejų pusių hippocampus

3) anterior commissure sudaryta iš dviejų dalių:

a) PRIEKINĖ DALIS – ant. olfactory nucleus skaidulos, einančios į contralateral olfactory bulb

b) UŽPAKALINĖ DALIS – komisūrinės skaidulos jungiančios didesnę temporal cortex dalį; taip pat eina skaidulos, jungiančios dalį frontal cortex, amygdala (stria terminalis) ir kt.

Apie komisūrotomijų efektus žr. – A 157 ~~3318–3320~~ psl.

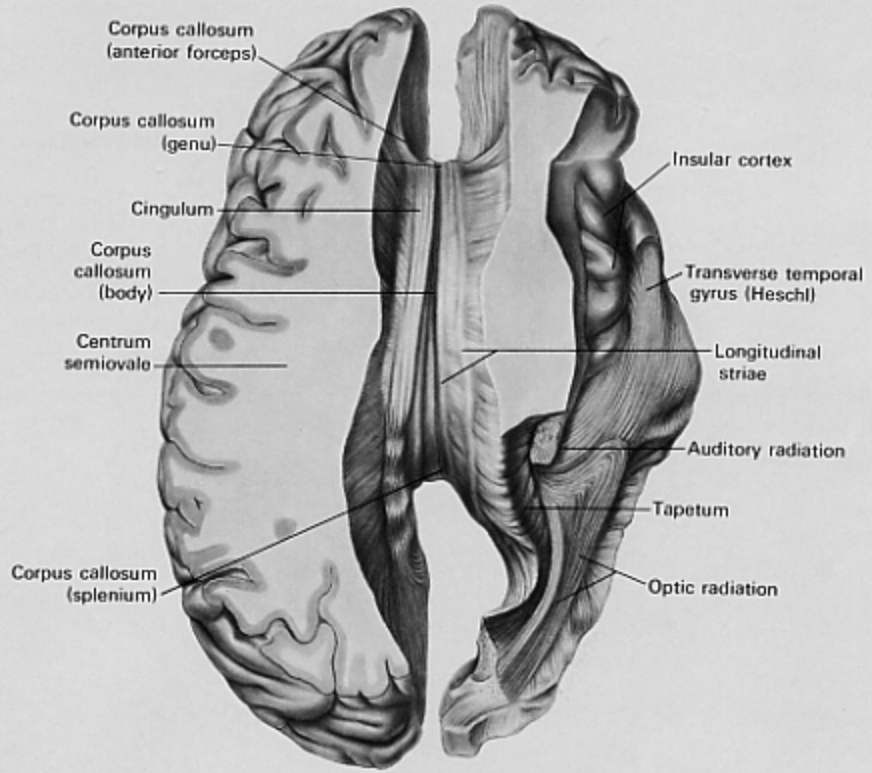


Fig. 2-7. Dissection of the superior surface of the hemispheres exposing the corpus callosum, cingulum, longitudinal striae and the optic and auditory radiations (from Mettler's *Neuroanatomy*, 1948; courtesy of The C. V. Mosby Company).

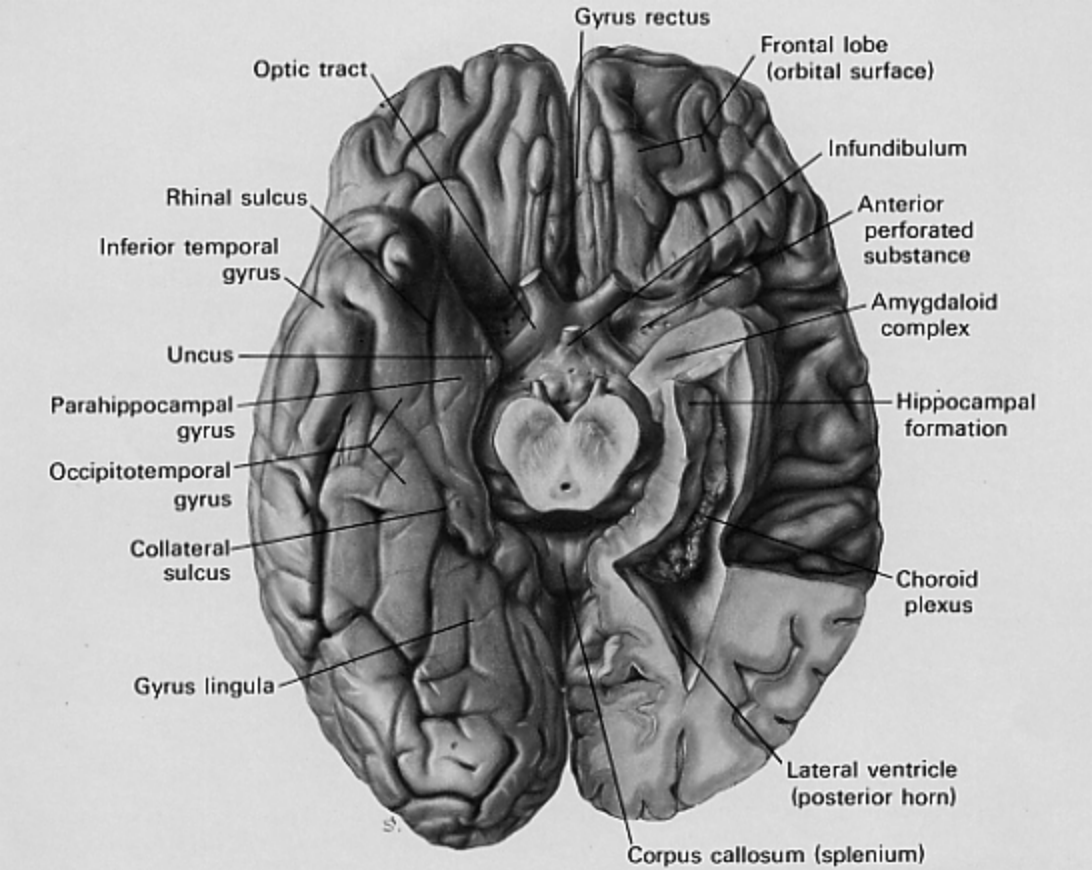


Fig. 2-6. View of the inferior surface of the brain following transection of the midbrain. The inferior and posterior horns of the left lateral ventricle have been opened and portions of the temporal lobe have been removed (from Mettler's *Neuroanatomy*, 1948; courtesy of The C. V. Mosby Company).

NONCORTICAL COMMISSURES

DIENCEPHALON

1) habenular commissure – jungia habenular nuclei

2) posterior commissure (technikai priskiriama midbrain) –
– jungia pretectal areas – rostraline mesencephalic tectum dalis (aferentės – from optic tract; eferentės – to Edinger-Westphal nucleus of CN III)

SPINAL CORD – commissura alba ant. et post.