# Blood Supply of Brain.

It is by two sets of artery.

→ pair of internal carotid artery.

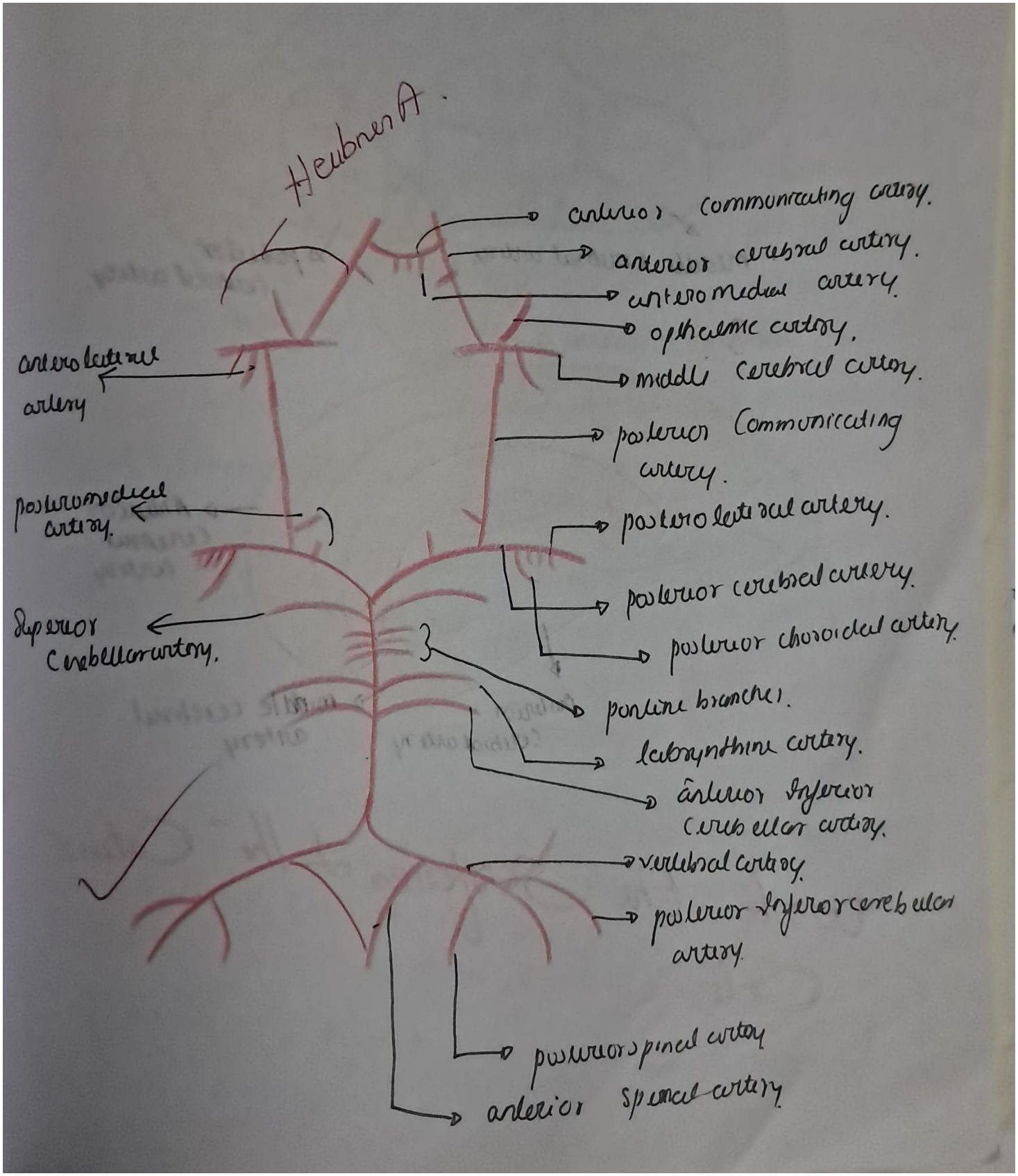
→ pair of vertebral artery.

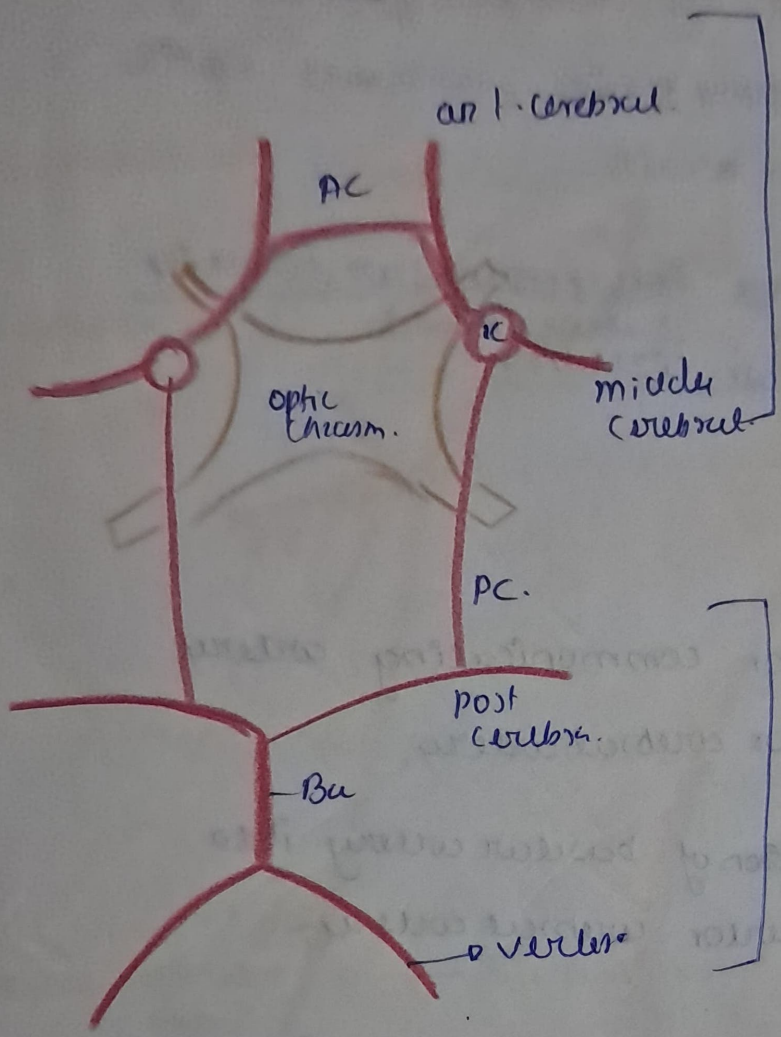
mode of supply.

- anterior circulation of brain → *by internal carotid artery. : fossamen lacerum
  (80%)
  * supplies supratentorial ie, cerebrum & diencephalon.

- posterior circulation → by vertebral arteries. → fossamen magnum.
  (20%)
  * supplies Infratent ie, cerebellum & brain stem.

→ Anterior & posterior circulations are connected to each other @ base of brain around optic chiasma by posterior common arteries.


Heubner A.
anterior communicating artery.
anterior cerebral artery.
anteromedial artery.
ophthalmic artery.
middle cerebral artery.
anterolateral artery
posterior Communicating artery.
posteromedial artery.
posterolateral artery.
posterior cerebral artery.
posterior choroidal artery.
Superior Cerebellar artery.
pontine branches.
labyrinthine artery.
anterior Inferior Cerebellar artery.
vertebral artery.
posterior Inferior cerebellar artery.
posterior spinal artery
anterior spinal artery




anterior circulation 80%
by Carotid system.

posterior circulation 20%.
vertebro-basilar system.

# Circle of willis / circulus arteriosus

→ six sided polygon of arteries formed by the major arteries supply brain, around optic chiasma, at base of brain.

→ It is formed around Interpeduncular fossa
lies in Interpeduncular cistern (subarachnoid)..

## Formation

→ anteriorly: anterior communicating artery.
anterior cerebral artery.

→ posteriorly ÷ division of basilar artery into
2 posterior cerebral artery.

→ laterally: two posterior communicating artery.

## Functional Significance.

Normally, right half of brain is supplied by → right vertebral & right ICA.

left side → left vertebral & left ICA.

- If one of the major arteries forming circle of willis is blocked, circle of willis provides various alternative root for collateral circulation like in arterial bypass surg.

## Branches.

- Cortical branches ⟶ Cerebrum. } anastomose freely
- Central branches ⟶ Internal capsule, thalamus, } no anastomose
  Corpus striatum.
- Choroidal branches ⟶ Choroid plexus of ventricles.

## Cortical branches

arise from ⟶ anterior, posterior, middle } cerebral arteries.

Supply - Cerebrum ⟶ Superolateral surface. ⟶ mainly (2/3)rd. middle cerebral artery.

Except ⟶ Strip of cerebral cortex 2.5 cm wide.
along superomedial border.
from frontal pole to parietal pole
⟶ anterior cerebral artery.

- Narrow strip along lower border of temporal & occipital lobe ⟶ posterior cerebral artery.

temporal pole ⟶ MCA.

medial surface → anterior cerebral artery.

Except → Occipital & temporal lobe.
by PCA.

but temporal pole → middle CA.

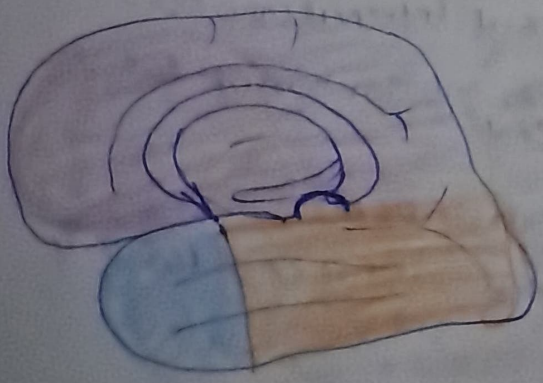
inferior surface → PCA.

Except → ~~lateral part of~~ temporal pole + lateral part of ~~orbital surface~~
~~temporal lobe~~ → MCA.

medial part of orbital part of
temporal lobe → ACA.

superolateral.

medial surface.



## Cerebral branches

- Anteromedial → 1 group → arise from anterior cerebral arteries.
  group

- anterolateral → 2 group → arise from middle cerebral arteries
  - divides → medial striate → CN I C.
  - lateral striate → enter I C.
    - one of the lateral striat.
    - is larger → charcots artery.
      of cerebral hemorrage.

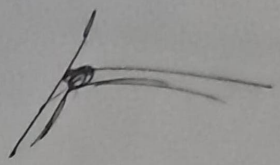
- posteromedial (1gr) → } arise from posterior cerebral arteries.
- posterolateral → } arise from posterior cerebral arteries.
  2 gr

## Choroidal branches

- Anterior choroidal → branch of internal carotid.
  supplies inferior horn of lat V.
  CP of
- posterior choroidal → branch of PCA.
  supplies rest of CP of lat V. & 3rd V.
- PICA → CP of 4th ventricle.

## Applied Aspect

- lateral striate artery from middle cerebral artery
  - → frequent ruptured
  - → charriot's artery of cerebral hemorrage
  - → hemiplegia.



Bloc

- Berry aneurism
  - localised dilation on one of artery of circle of Willis due to congenital muscular weakness.

common site: Jnct btw anterior cerebral & anterior communicating b.

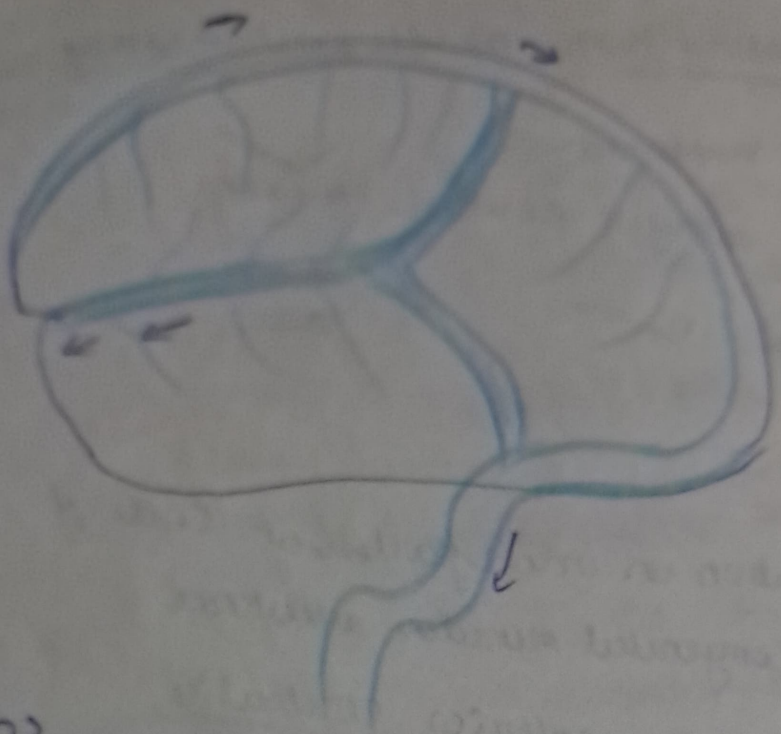
## Venous drainage.

- they drain into dural venous sinuses & finally into IJV.

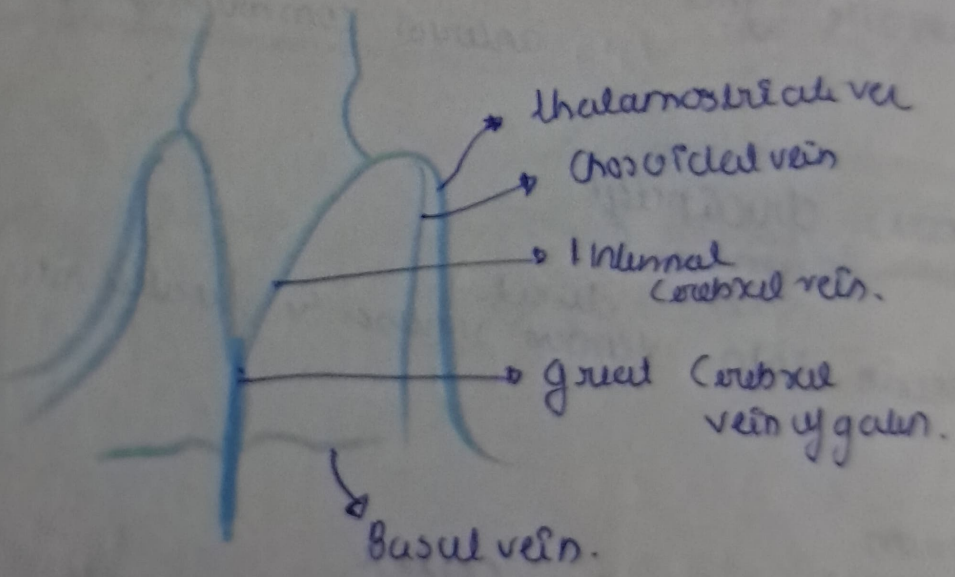
- Cerebrum
  - superficial veins → drain, cortex → subcortical white matter
  - deep veins → internal substance.

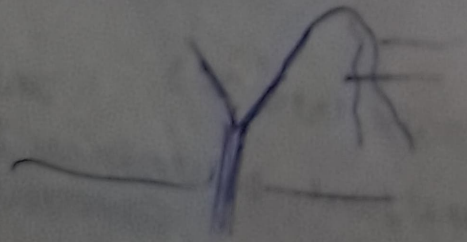
- Superficial → superior → drain into SSS
  - middle → superficial → terminate in. ant Cavernous sinus
  - post → SSS & transverse
  - deep → drain inferior Surface.

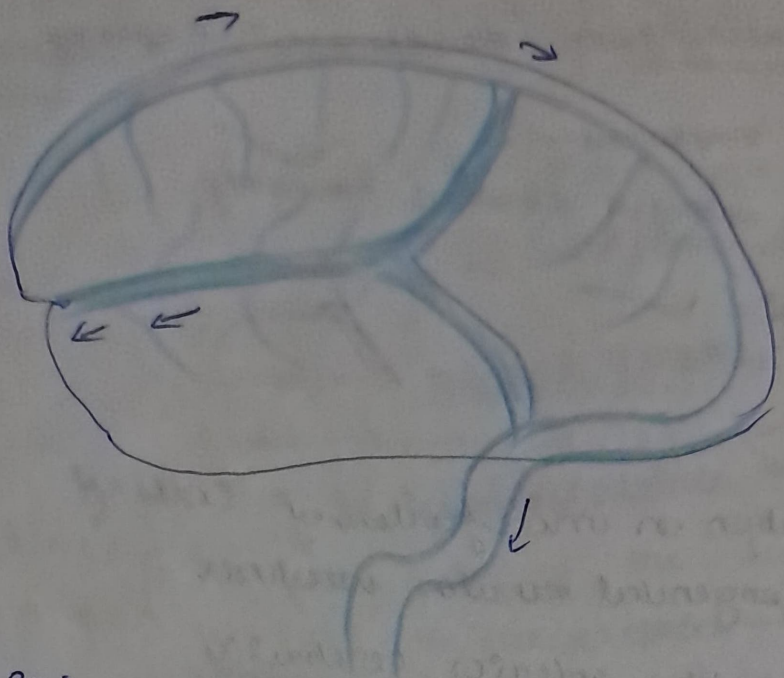
Thalamostriate



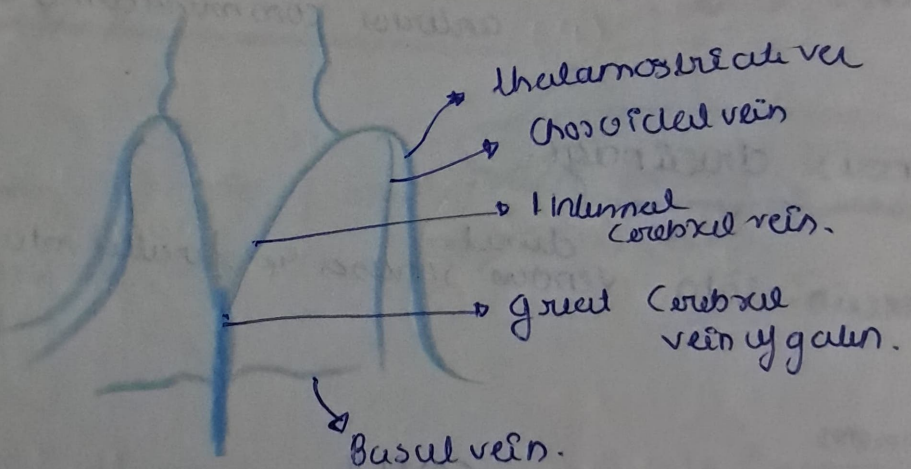
**deep veins**


thalamostriate vein
choroidal vein
Internal cerebral vein.
great cerebral vein of galen.
Basal vein.





Deep veins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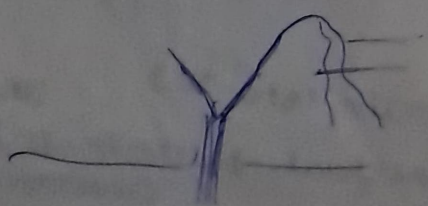

## Applied Anatomy

- Intracranial dural venous thrombosis
- Subdural hemorrage.

## Blood brain barrier

- capillary endothelial cells with tight junctions
- basement membrane.
- foot process of astrocytes.

## out of bbb

- pineal gland.
- posterior lobe of pituitary.