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# Cerebral blood circulation

## CEREBRAL ARTERIAL SUPPLY

- It is composed of two arterial systems:
  - Carotid System
    - It is composed of
      - Internal carotid artery
        - It's branches
          - Anterior cerebral artery
            - Supplies
              - orbital
              - medial surfaces of the frontal and parietal lobes
              - narrow part on the superolateral surface.
          - Middle cerebral artery
            - Supplies
              - entire Superolateral surface
                - Somatosensory Cortex
                - Motor Cortex
                - Language areas
                - Broca's Area
                - Wernicke's Area
                - Auditory areas
                - Primary auditory area
                - Auditory association (Heschl's Gyrus)
  - Vertebro Basilar System
    - The two Vertebral arteries ( from Subclavian artery )
      - unite to form
        - Basilar artery
          - at the upper border of the pons it divides into two:
            - Posterior Cerebral arteries.
              - Supplies
                - Anterior and inferior parts of temporal lobe.
                - Uncus
                - Inferior temporal gyrus.
                - Inferior and Medial parts of Occipital lobe (visual areas)
- Circulus Arteriosus (of Willis)
  - It joins the Carotid & Vertebrobasilar systems
  - located
    - on the base of the brain
  - It encircles
    - Optic Chiasma
    - Hypothalamus
    - Pituitary gland
    - Midbrain
  - Composed of
    - 2 Anterior cerebral arteries
    - 2 Internal carotid arteries
    - 2 Posterior cerebral arteries
    - 2 Posterior communicating arteries
    - 1 Anterior communicating artery
  - Branches
    - Anterior Perforating arteries
    - Posterior Perforating arteries
- Arterial Disorders
  - Stroke
    - Ischemic
    - Hemorrhagic
  - Angioma
  - Aneurysm
  - EFFECT OF OCCLUSION of Cerebral arteries
    - ACA
      - Motor & sensory disturbances
      - Difficulty in the Prefrontal lobe functions
    - MCA
      - Contralateral weakness
      - Contralateral sensory loss
      - Aphasia (language disturbances )
    - PCA
      - Visual disturbances
        - Contralateral
          - homonymous hemianopia
        - Bilateral lesion
          - Cortical Blindness
      - Memory impairment

## Cerebral Venous Drainage

- Cortical Veins
  - Superficial
    - A.Superior cerebral veins
      - Drain lateral surface of brain above the lateral sulcus
        - Terminates
          - Mainly
            - into the Superior Sagittal sinus
          - Partly
            - Superficial middle cerebral vein.
      - found in the Subarchnoid space Drain the cortical surfaces
    - B.Inferior cerebral veins
      - Run below the lateral sulcus, Drain the lateral surface of the temporal lobe
        - Terminates
          - into superficial middle cerebral vein
          - Transverse sinus.
    - C.Superficial middle cerebral vein
      - Runs along the lateral sulcus
        - Terminates
          - into the Cavernous sinus
        - It is connected posteriorly through
          - Superior & Inferior anastomotic veins
            - To
              - Superior Sagittal & Transverse sinuses.
  - Deep veins
    - Drain the deeper structures
      - They merge to form two
        - Internal Cerebral Veins.
          - The two veins unite in the midline to form the
            - Great Cerebral vein.
              - This short vessel joins
                - the Inferior Sagittal sinus
                - to form
                - the Straight S
  - Dural Venous Sinuses
    - Paired
      - Transverse
      - Sigmoid
      - Cavernous
      - Petrosal
        - Superior
        - Inferior
    - Single
      - Superior sagittal.
      - Inferior sagittal.
      - Straight
      - Occipital
    - Blood flows from transverse & sigmoid sinuses into IJV
  - Venous Disorders
    - Infarcation
    - Sinus thrombosis