



- Vascular diversity:

- **Anterior circulation (carotid system): formed by branches from internal carotid artery (ICA).**
 - ✓ Common carotid arteries (from both sides) → internal carotid arteries which will enter the cranium through carotid canal → passing through cavernous sinus → providing the main branches:
 - ❖ Anterior cerebral arteries (ACA):
 - Connected to each other through anterior communicating artery.
 - Supplying the medial aspects of frontal and parietal lobes and corpus callosum.
 - *When there is a lesion: it results in contralateral hemiplegia and loss of sensation in lower limbs.*
 - ❖ Middle cerebral arteries (MCA):
 - Passing through the lateral fissure of the brain (Sylvian fissure).
 - Supplying the lateral aspects of frontal lobe, parietal lobe and most of temporal lobe.
 - *When there is a lesion: it results in major motor and sensory deficits (excluding lower limbs). Notice if left hemisphere is affected there will be speech/language deficits.*
- **Posterior circulation (vertebrobasilar system): formed by branches from vertebral and basilar arteries.**
 - ✓ Vertebral arteries arise from subclavian arteries (at both sides) → ascending through foramina transversaria of cervical vertebrae → entering the cranium through foramen magnum → uniting to form basilar artery which is running in basilar groove (anterior surface of pons) → terminating as posterior cerebral arteries at the level of midbrain.
 - ❖ Anterior spinal artery: it is formed by 2 branches → each is coming from 1 vertebral artery. it is running in ventral median fissure of the spinal cord and supplying its anterior 2/3.
 - ❖ Posterior spinal arteries: they are branching from vertebral arteries or from posterior inferior cerebellar arteries (PICAs). they are supplying the posterior 1/3 of the spinal cord (dorsal column).
 - ❖ Posterior inferior cerebellar artery (PICA): branching from vertebral arteries.
 - ❖ Anterior inferior cerebellar artery (AICA): branching from basilar artery.
 - ❖ Labyrinthine artery: it is a branch from the basilar artery entering the internal auditory canal to supply inner ear.
 - ❖ Superior cerebellar artery: branching from basilar artery at the level of midbrain.
 - ❖ Posterior cerebral arteries (PCA): terminal branches of vertebrobasilar system and communicating with carotid system through posterior communicating artery.
 - Supplying occipital lobe and portions of the temporal lobe.
 - *When there is a lesion: there will be visual field deficits. diencephalon and midbrain might also be affected.*
- **Central (ganglionic) branches:**
 - ✓ Medial lenticulostriatal artery (M-LSA):
 - ❖ *Branching from A1-segment of anterior cerebral artery.*
 - ❖ Supplying: anterior limb of internal capsule and anterior inferior parts of basal ganglia.
 - ✓ Lateral lenticulostriatal artery (L-LSA):
 - ❖ *Branching from horizontal M1-segment of middle cerebral artery.*
 - ❖ Supplying: parts of head and body of caudate nucleus, most of globus pallidus and putamen and posterior limb of internal capsule.



- **Watershed infarcts:**

- Occurring at the border zones between terminal branches of major arteries (due to hypoperfusion).
- **There are 2 patterns of border zone infarcts:**
 - ✓ Cortical border zone infarction: at junction of ACA/MCA or PCA/MCA
 - ✓ Internal border zone infarction: at junction of lenticulostriatal artery (LSA)/MCA

