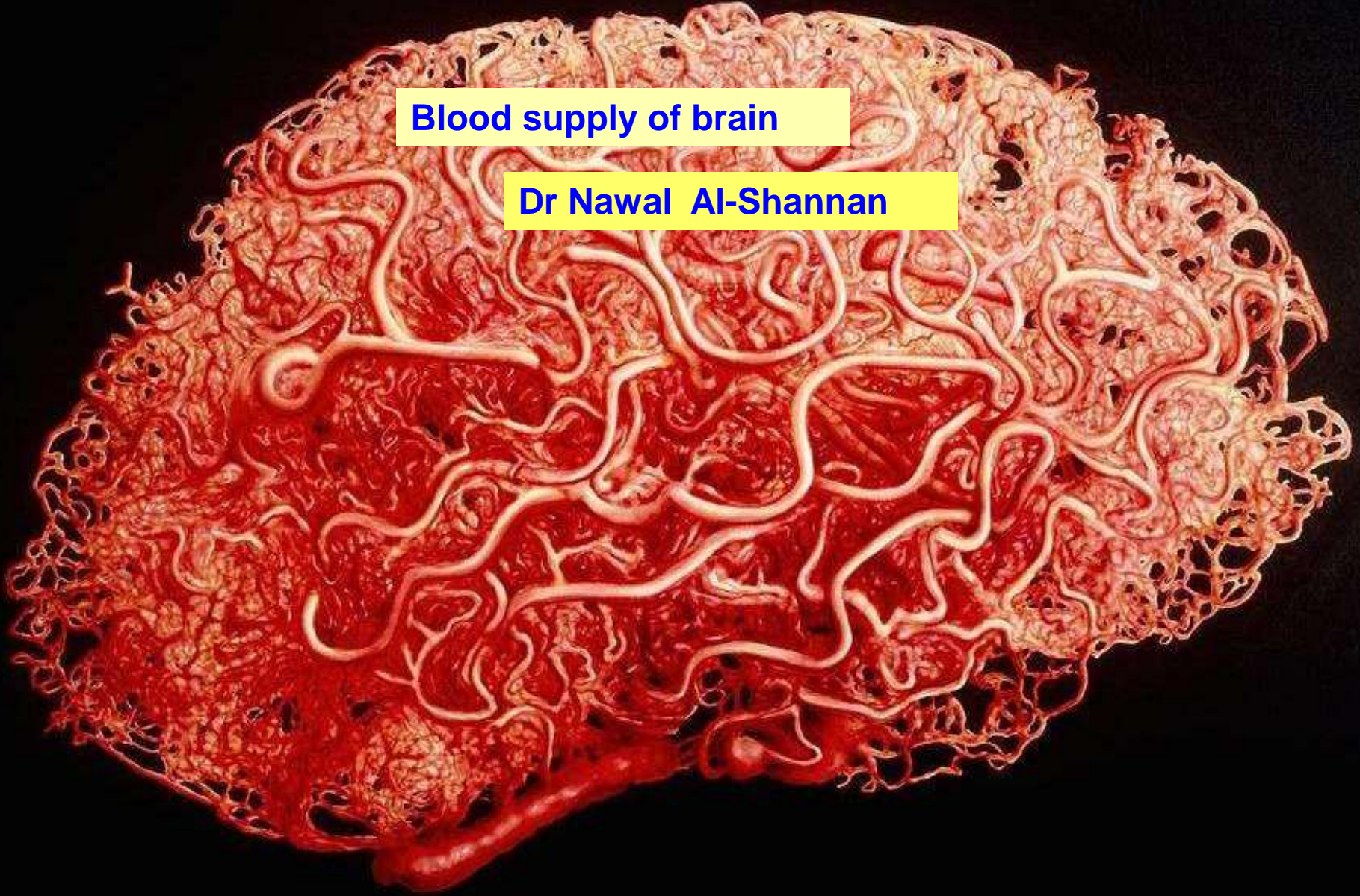
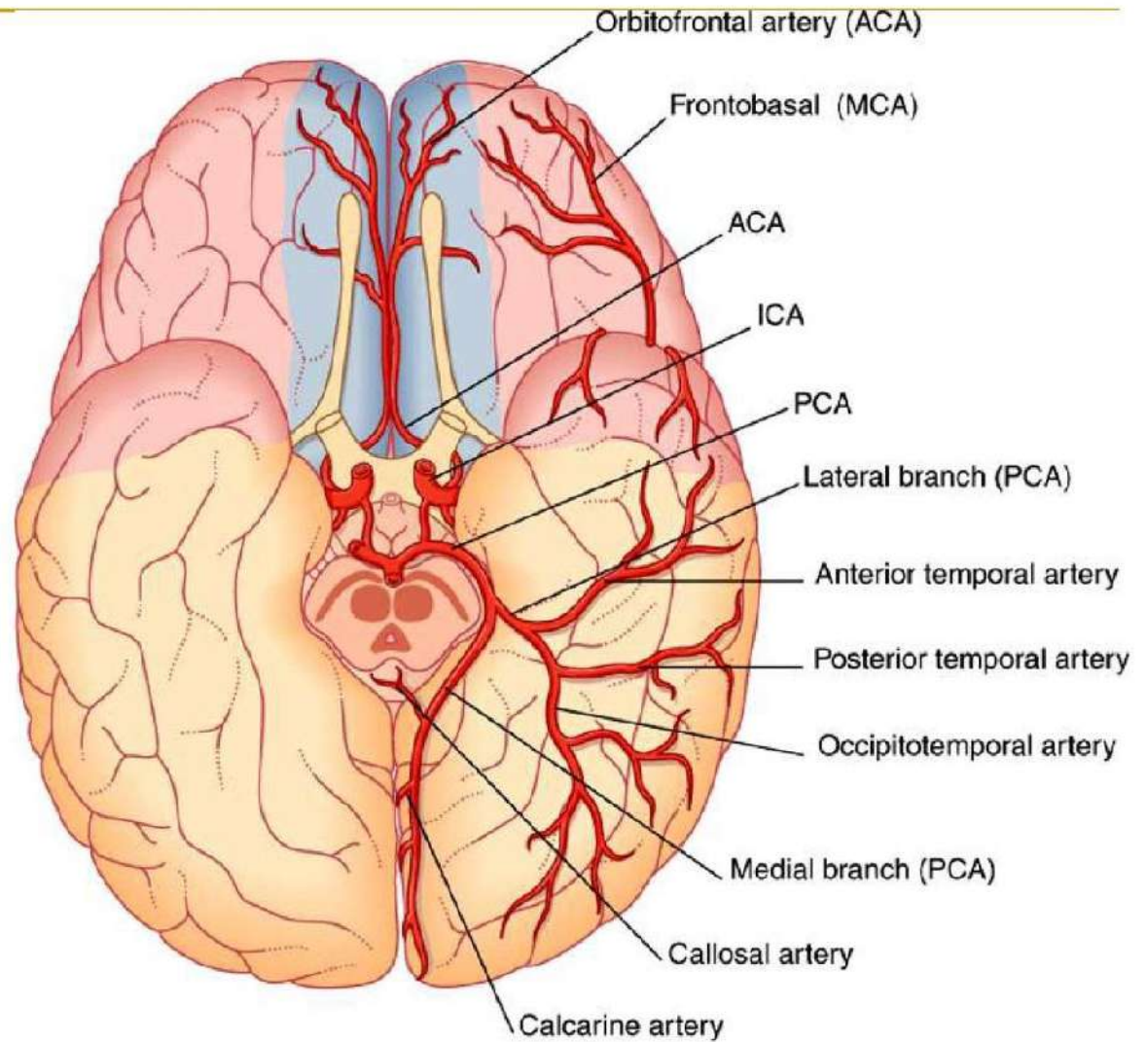


**Blood supply of brain**

**Dr Nawal Al-Shannan**





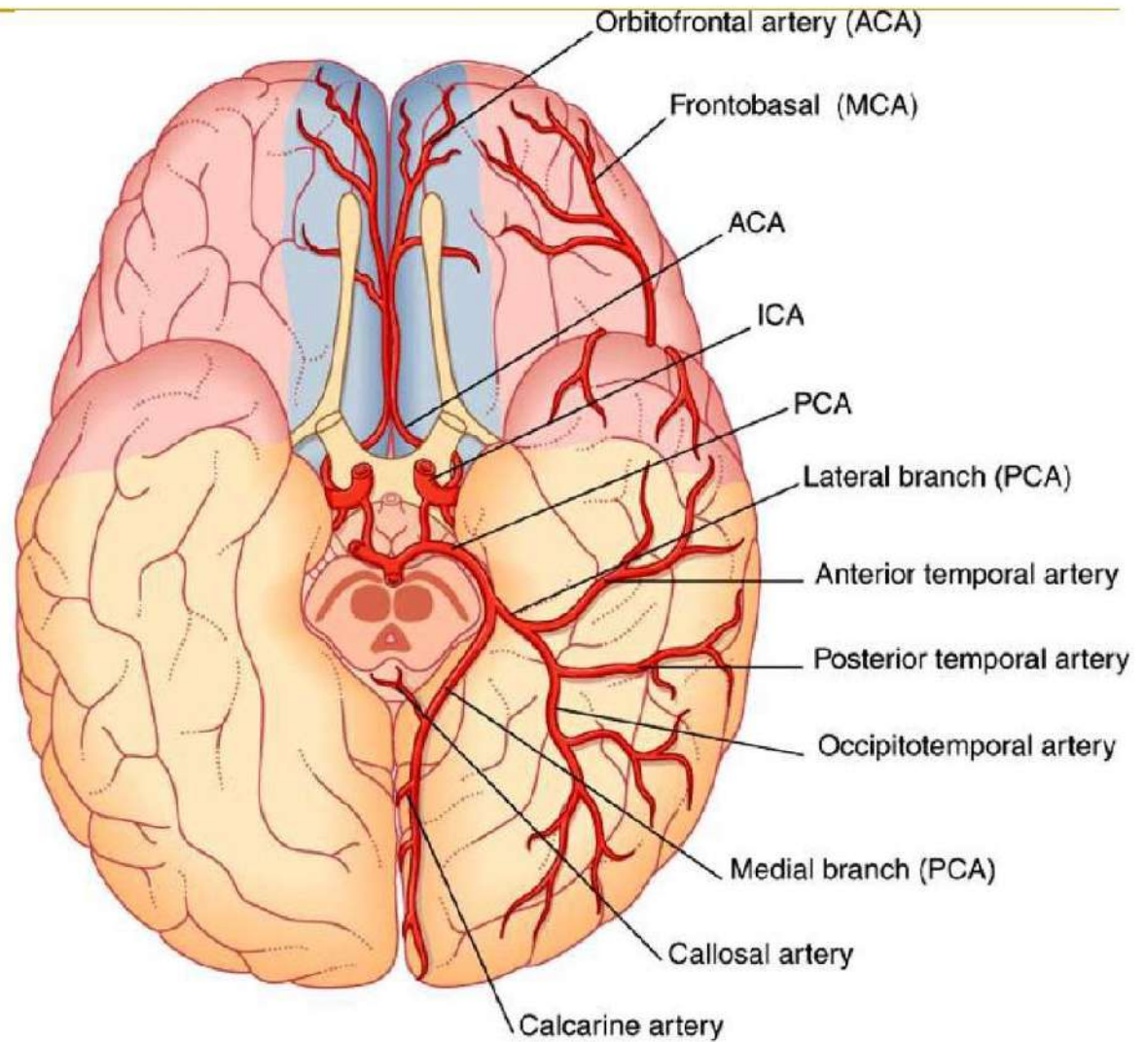
## Middle cerebral artery

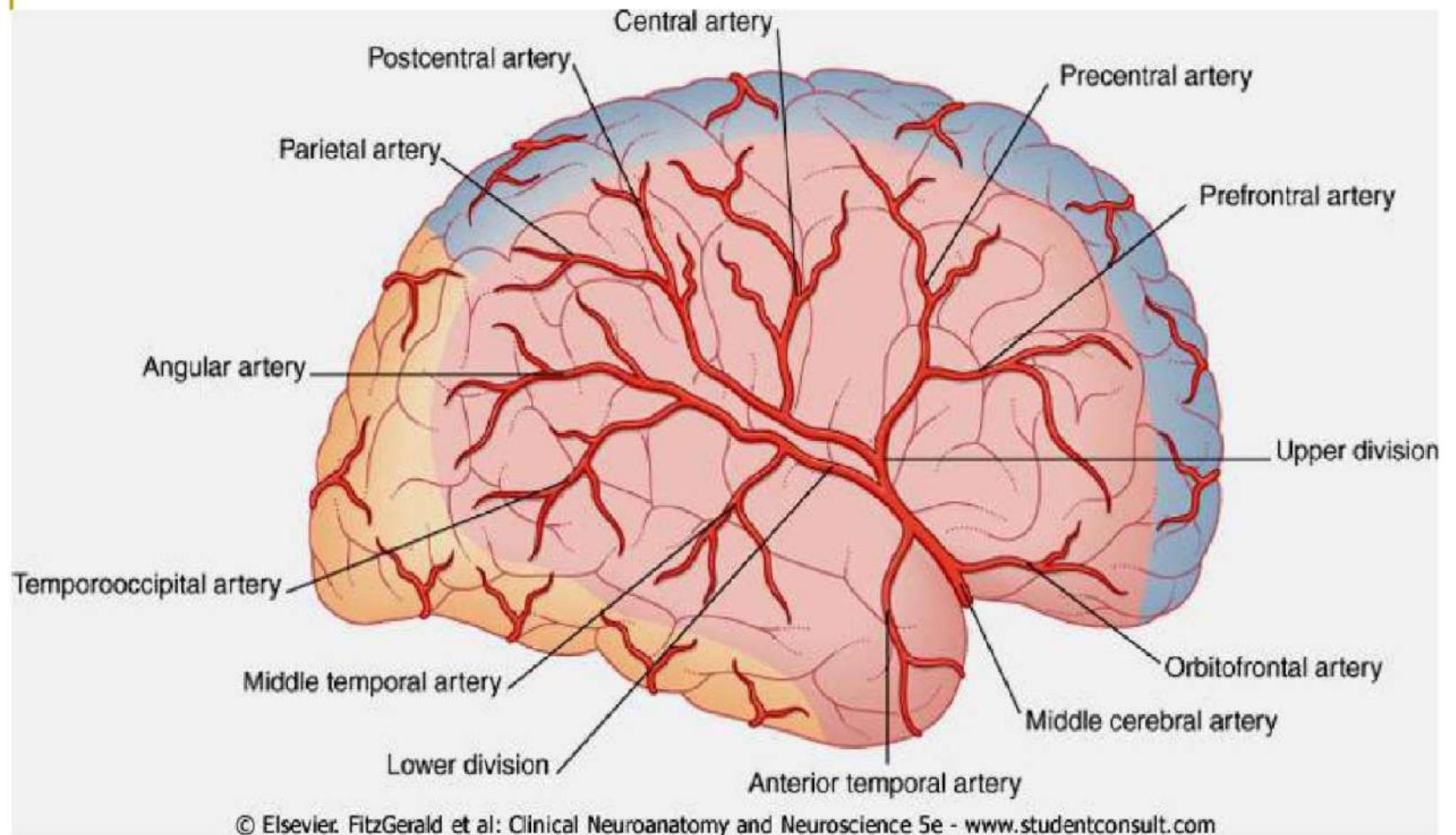
- large branch, more in direct continuation..  
Emboli?

---

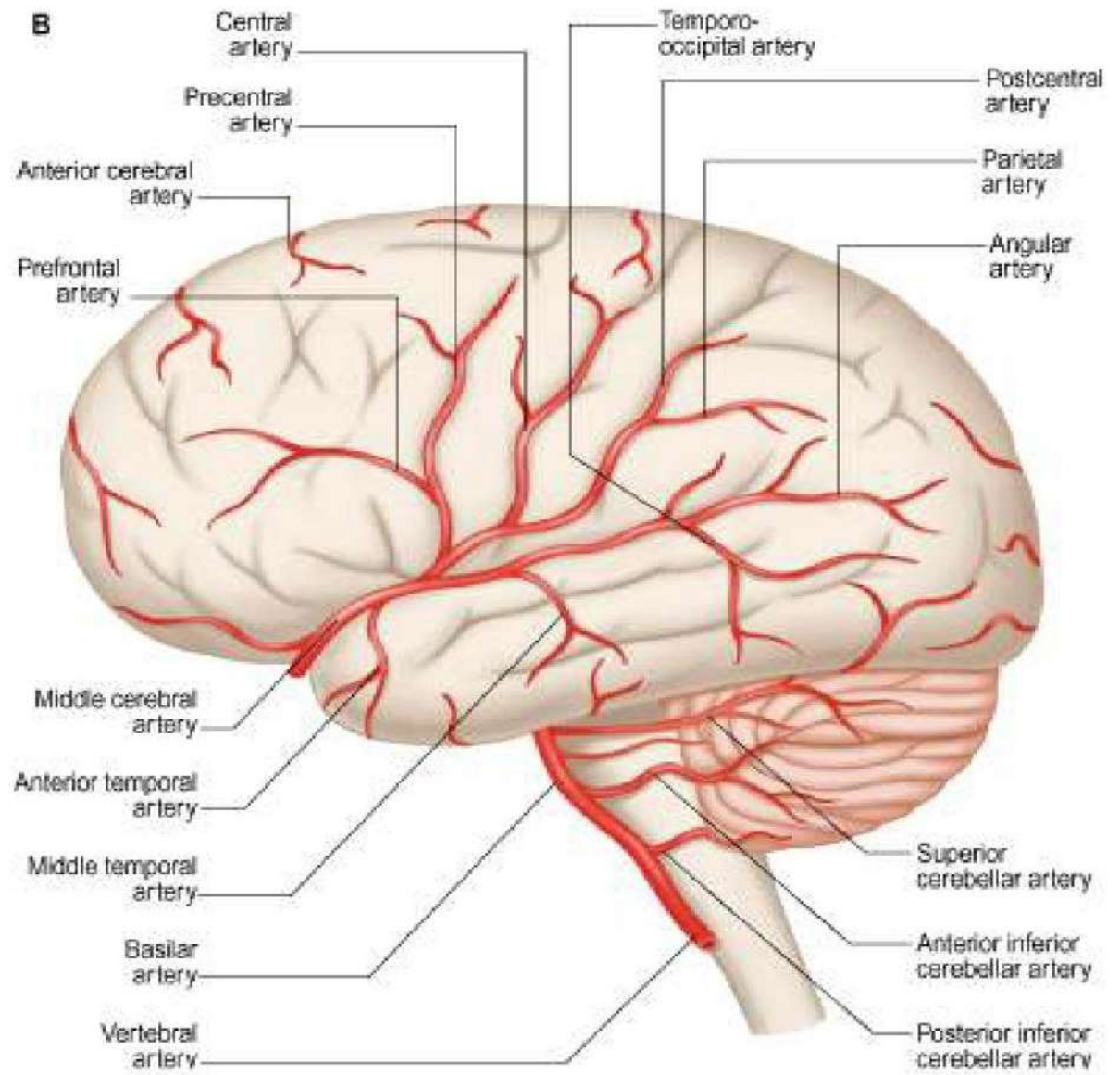
### Branches:

1. **Cortical** for insula, lateral surface, lateral half of orbit
  2. **Central** - striate arterioles
- \*\* they penetrate anterior perforated substances to reach corpus striatum and internal capsule
- one large artery is called **artery of cerebral hemorrhage** frequently replete causing hemorrhage inside cerebral hemisphere





**B**



## Clinical importance:

Supply 3 important areas

---

1. Motor and sensory areas of whole body except lower limb
2. Auditory area in temporal lobe
3. Genu and posterior limb of internal capsule

(\* 3 important area concerned with language)

- **Posterior cerebral artery**
  - belong to vertebro- basilar system.
- 

- 2 posterior cerebral arteries are 2 terminal branches of basilar artery which divide at upper end of pons

Branches :

### **1.Cortical**

- a. Main part of **tentorium** – inferior surface-
- b. Posterior part of **medial** surface
- c. **Occipital** lobe and lower part of temporal lobe on lateral surface



## 2. Central branches

Cerebral peduncles , mammillary bodies

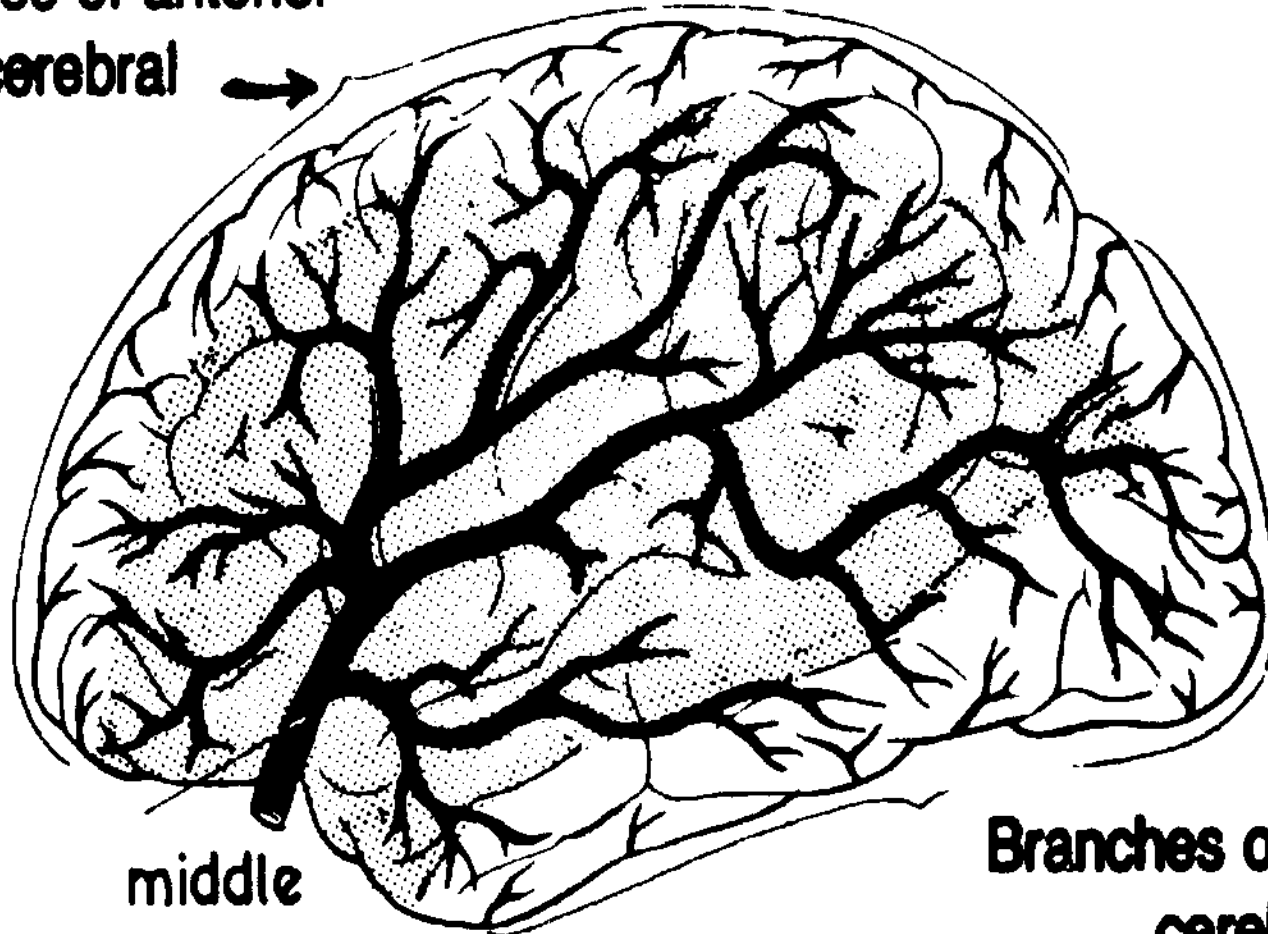
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### **Vertebro- basilar system:**

2 vertebral arteries and basilar artery

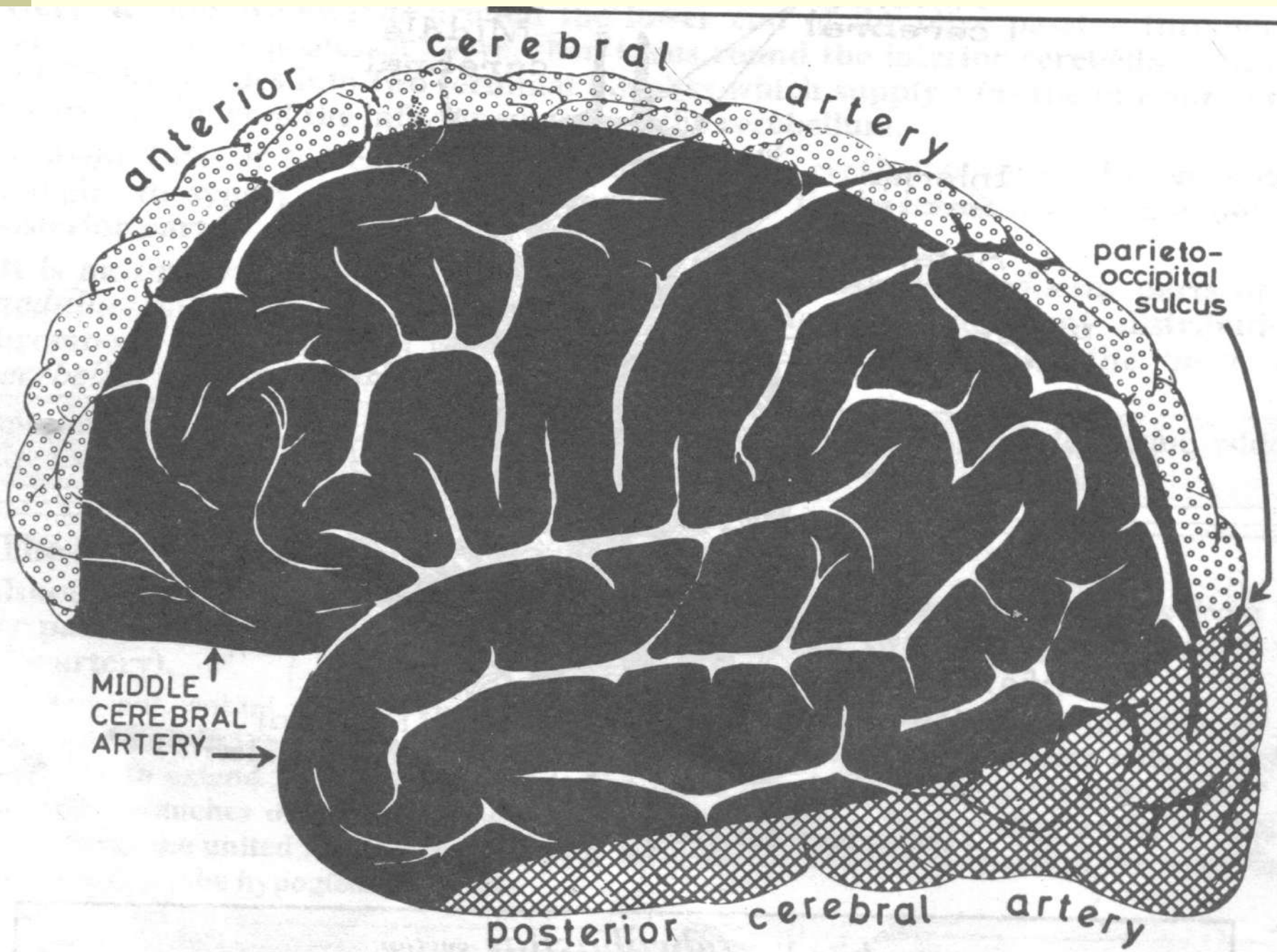
- arise from 1st part of **subclavian artery**
- enter skull through foramen magnum
- 2 vertebral arteries unite at lower border of pons to form basilar artery
- ends at upper part of pons by dividing into 2 terminal branches Rt and Lt posterior cerebral artery

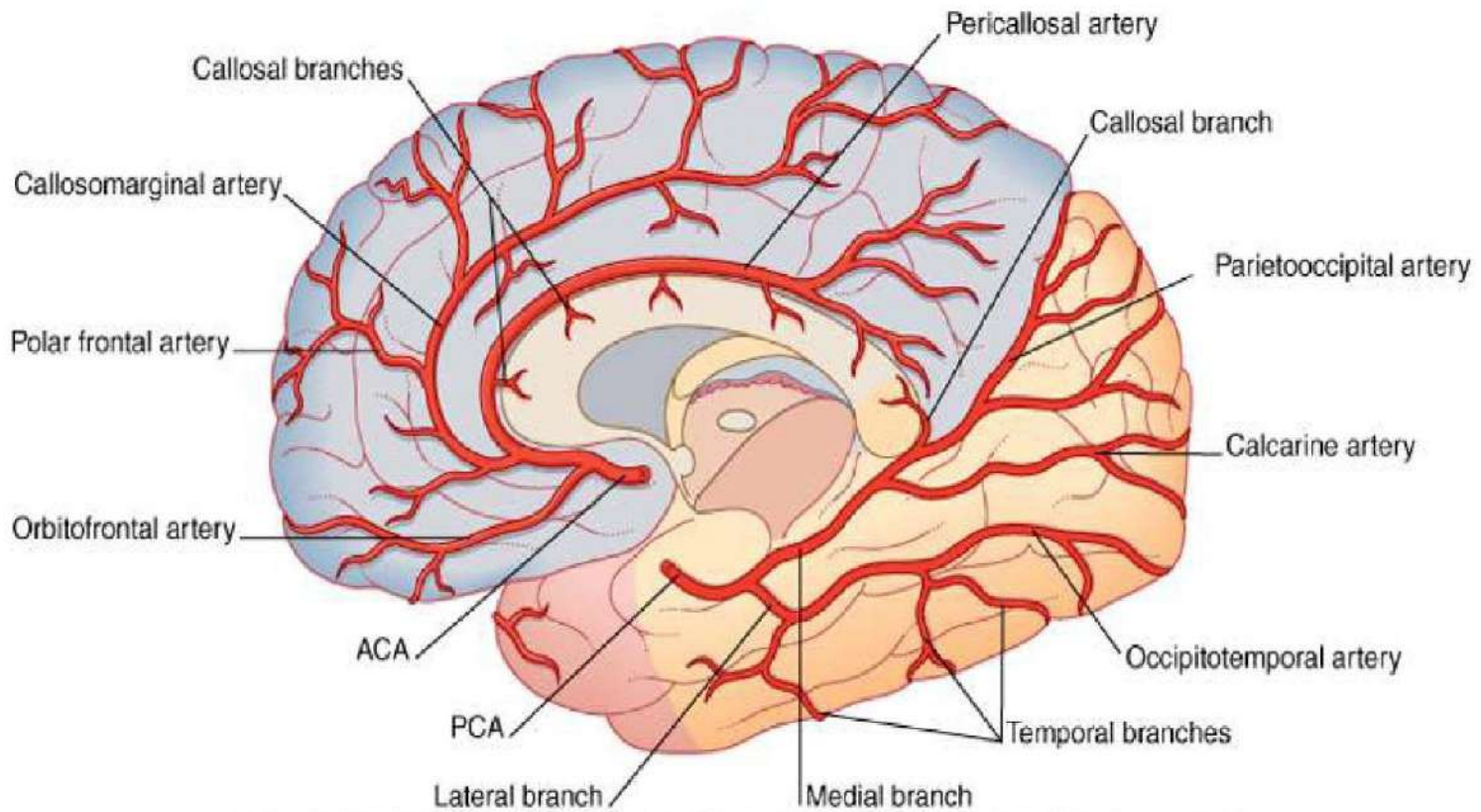
**Branches of anterior cerebral**



**middle cerebral**

**Branches of posterior cerebral**





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## Branches:

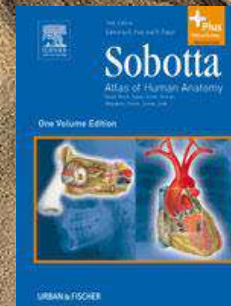
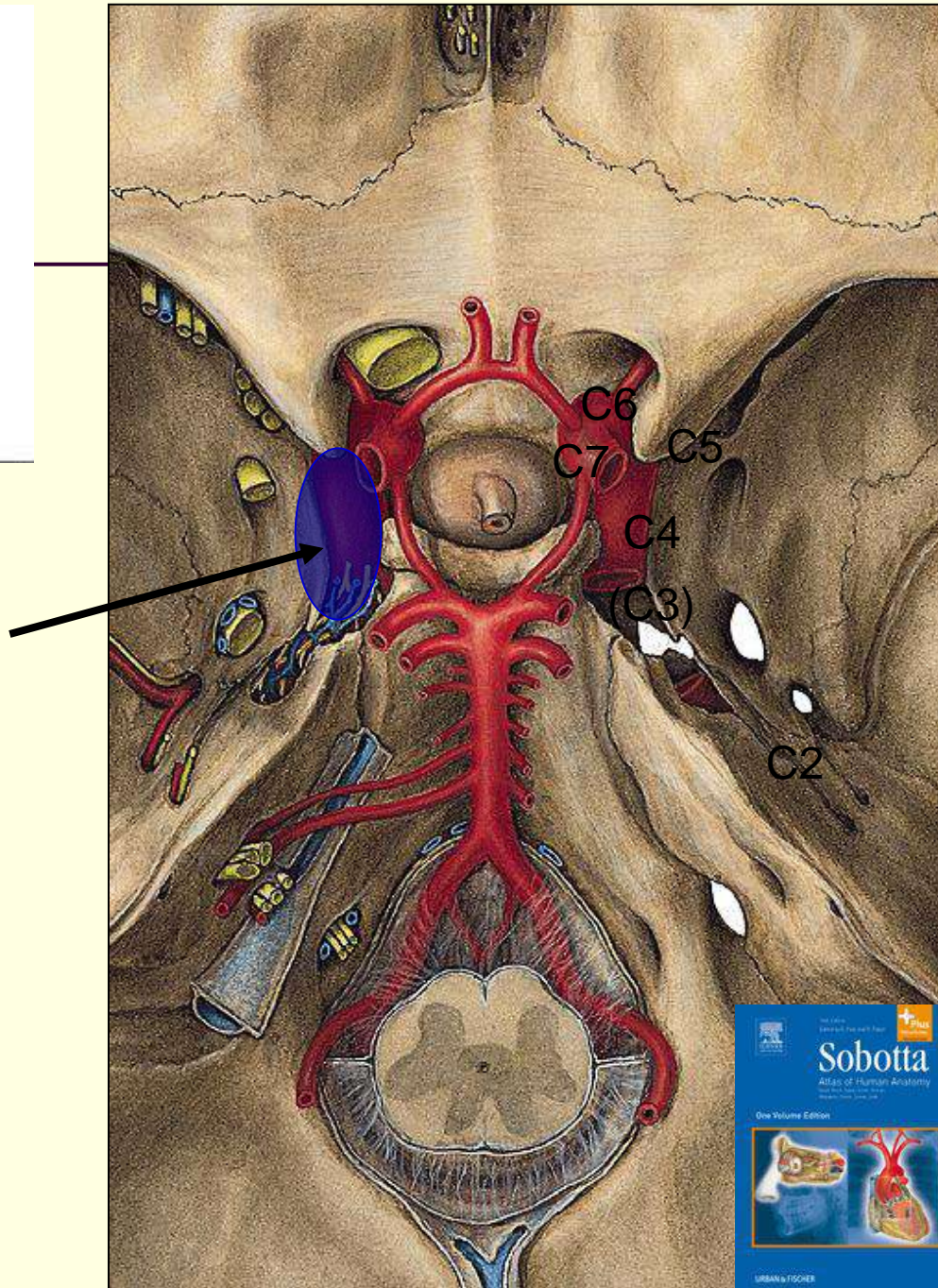
1. **Posterior inferior cerebellar artery** – imp
2. **Posterior spinal artery** below
3. **Anterior spinal artery** above
4. **Branches of basilar artery**

**\*\* Most branches arise from the sides and pass laterally**

1. **1. Anterior inferior cerebellar artery**
2. **Internal auditory arteries**
3. **Pontine branches**
4. **Superior cerebellar artery**

- C1 - cervical
- C2 - petrous
- C3 - lacerum
- C4 - cavernous
- C5 - clinoid
- C6 - ophthalmic
- C7 - communicating

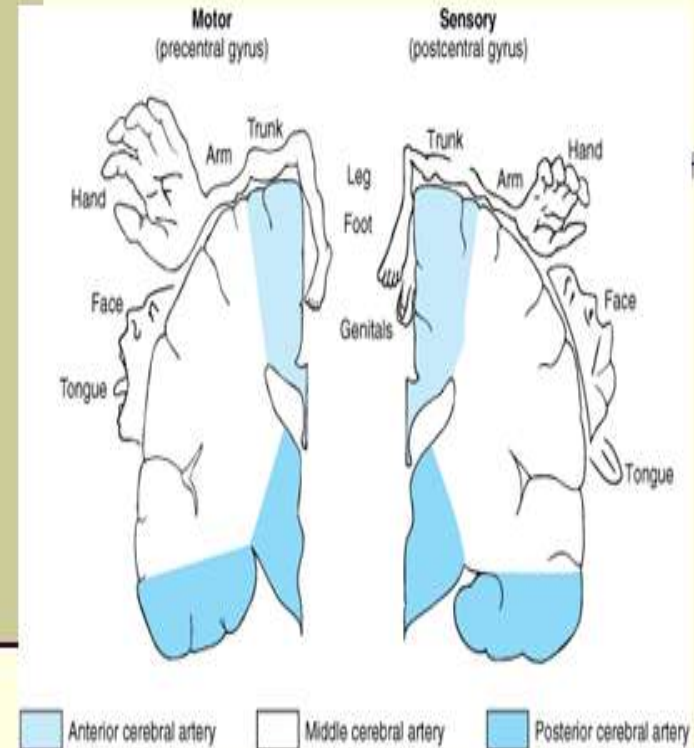
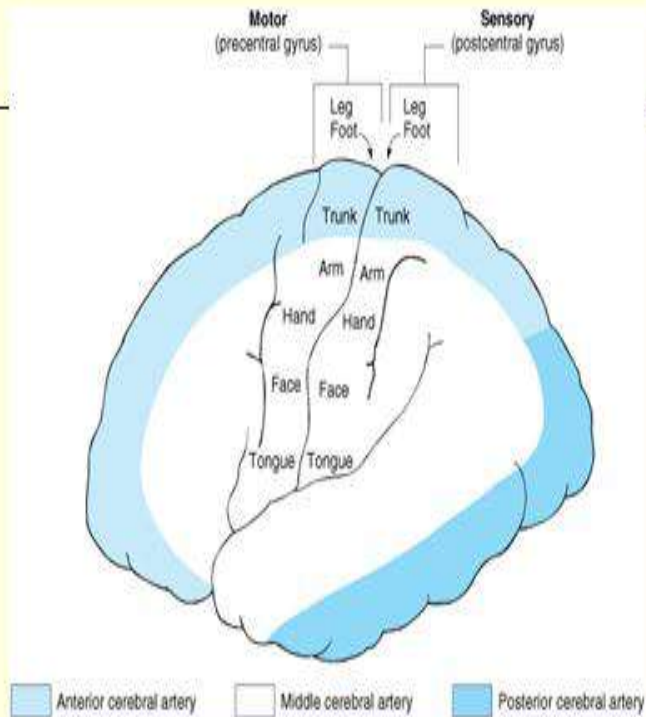
cavernous  
sinus



## Comparison between cerebral arteries

	<b>Anterior Cerebral</b>	<b>Middle Cerebral</b>	<b>Posterior Cerebral</b>
<b>Begins</b>	From int. carotid a.	From int. carotid a.	From basilar artery
<b>Sulcus related</b>	Callosal	Stem of lateral S.	Calcarine
<b>Branches</b>	1- Cortical 2- Central 3- Callosal	1- Cortical 2- Central	1- Cortical 2- Central 3- Callosal 4- Choroidal

# Parts of brain / blood supply





# Veins of Brain

\*Delicate venous drainage from the cerebral hemispheres emerges from the brain to form small venous structures in the pia mater

\*These larger venous channels then form **cerebral veins**, which bridge the subarachnoid space and enter into endothelial-lined sinuses within the **dura mater**

\*Possess **no** valves

\*Have extremely **thin walls**

- Pierce the arachnoid membrane and the inner or meningeal layer of the dura mater, and open into the **cranial venous sinuses**
- Divided into two sets:
  - **Cerebral**
  - **Cerebellar**

# Veins of Brain

---

Divided into

- **External group** (Superior, middle and inferior cerebral veins)
- **Internal group**
- **Superior cerebral veins:** Drain into the superior sagittal sinus
- **Middle cerebral vein:** Drains in the cavernous sinus
- **Connected:**
- (a) with the **superior sagittal sinus** by the great anastomotic vein of Trolard, which opens into one of the superior cerebral veins
- (b) with the **transverse sinus** by the posterior anastomotic vein of Labbé, which courses over the temporal lobe.
- **Inferior cerebral vein:** Drain in the superior sagittal sinus, cavernous, sphenoparietal, and superior petrosal sinuses

# Veins of Brain

---

- **Internal Cerebral Veins**
- Drain the **deep parts** of the hemisphere
- **Two** in number
- Formed near the interventricular foramen by union of Terminal vein and choroid veins
- they unite to form the **great cerebral vein**; just before their union each receives the corresponding basal vein
- Then curves backward and upward around the splenium of the corpus callosum and ends in the anterior extremity of the **straight sinus**

# VENOUS DRAINAGE

## brain and coverings

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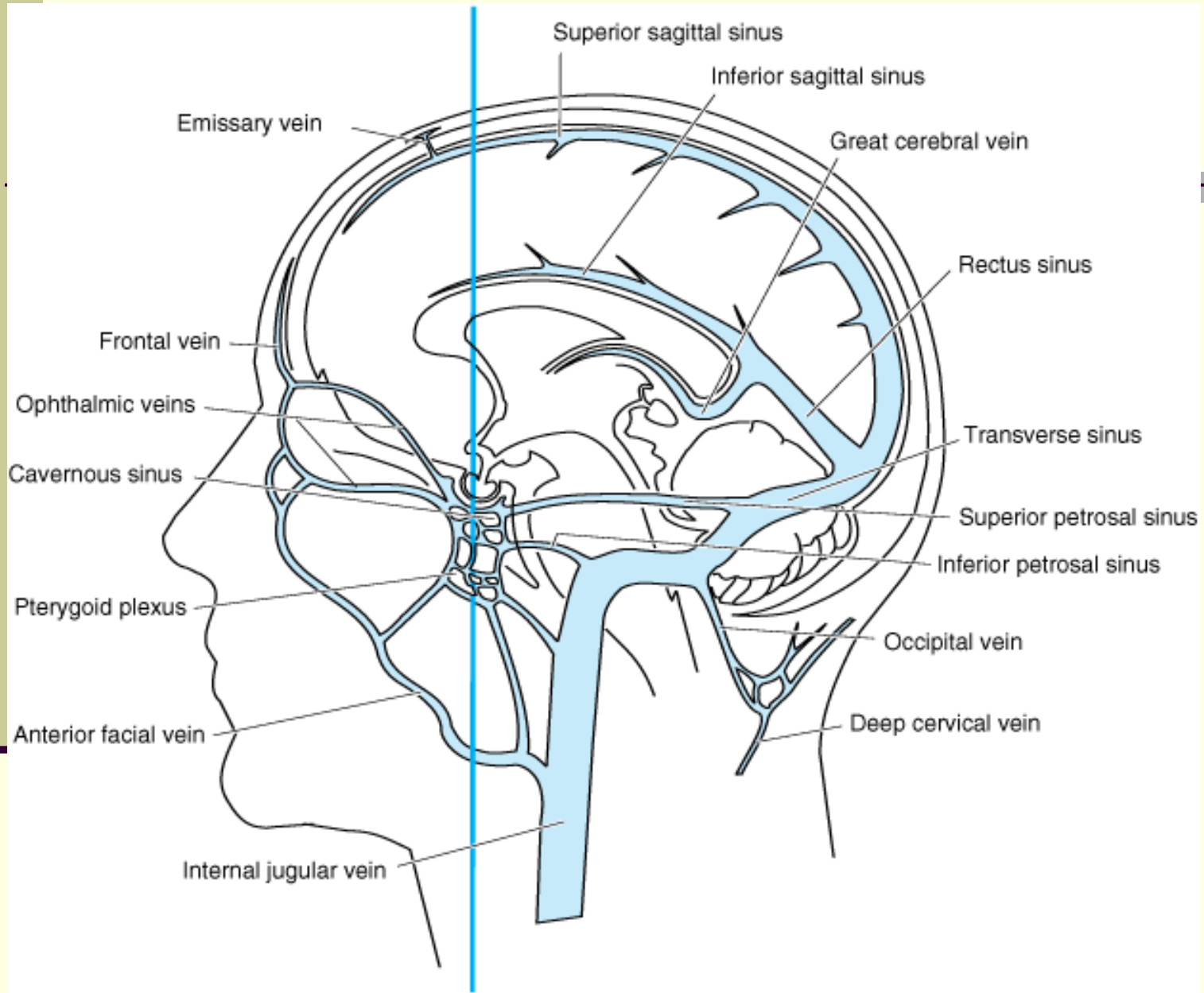
includes: ■

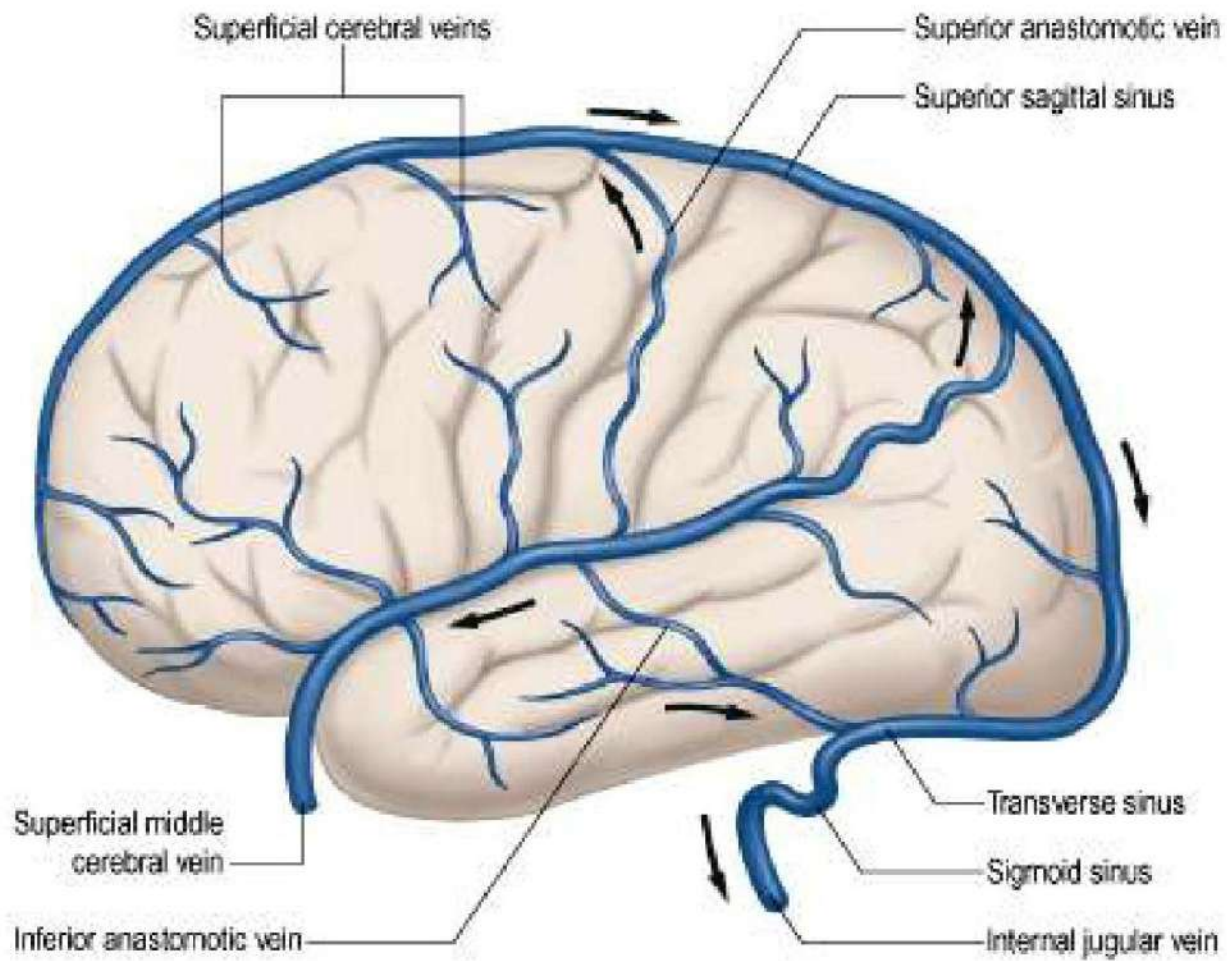
the **veins of the brain** itself, ■

the dural **venous sinuses**, ■

the dura's **meningeal veins**, ■

and the **diploic veins** between the tables of the skull. ■





Another classification:

Ophthalmic artery

Anterior choroidal artery

Majority of these branches will never be seen and is not necessary to note them!

Posterior communicating artery

Superior hypophyseal artery

Cerebral part

Cavernous part

Neural branch

Basal tentorial branch

Marginal tentorial branch

Inferior hypophyseal artery

Trigeminal ganglion branch

Meningeal branch

Cavernous sinus branch

Petrous part

Carotico-tympanic arteries

Artery of pterygoid canal

Cervical part

b

THIEME  
Atlas of Anatomy

Head and Neuroanatomy



Thieme

# Vertebral angiography: lateral

PCA

Sup. Cerebellar a

Bas.a.

Roof IV ventr.

Tonsil

PICA

Vert.a.

Precentral branch of sup.cerebellar.a

Vermian br. of sup. Cerebellar.a.

Tonsillar loop PICA

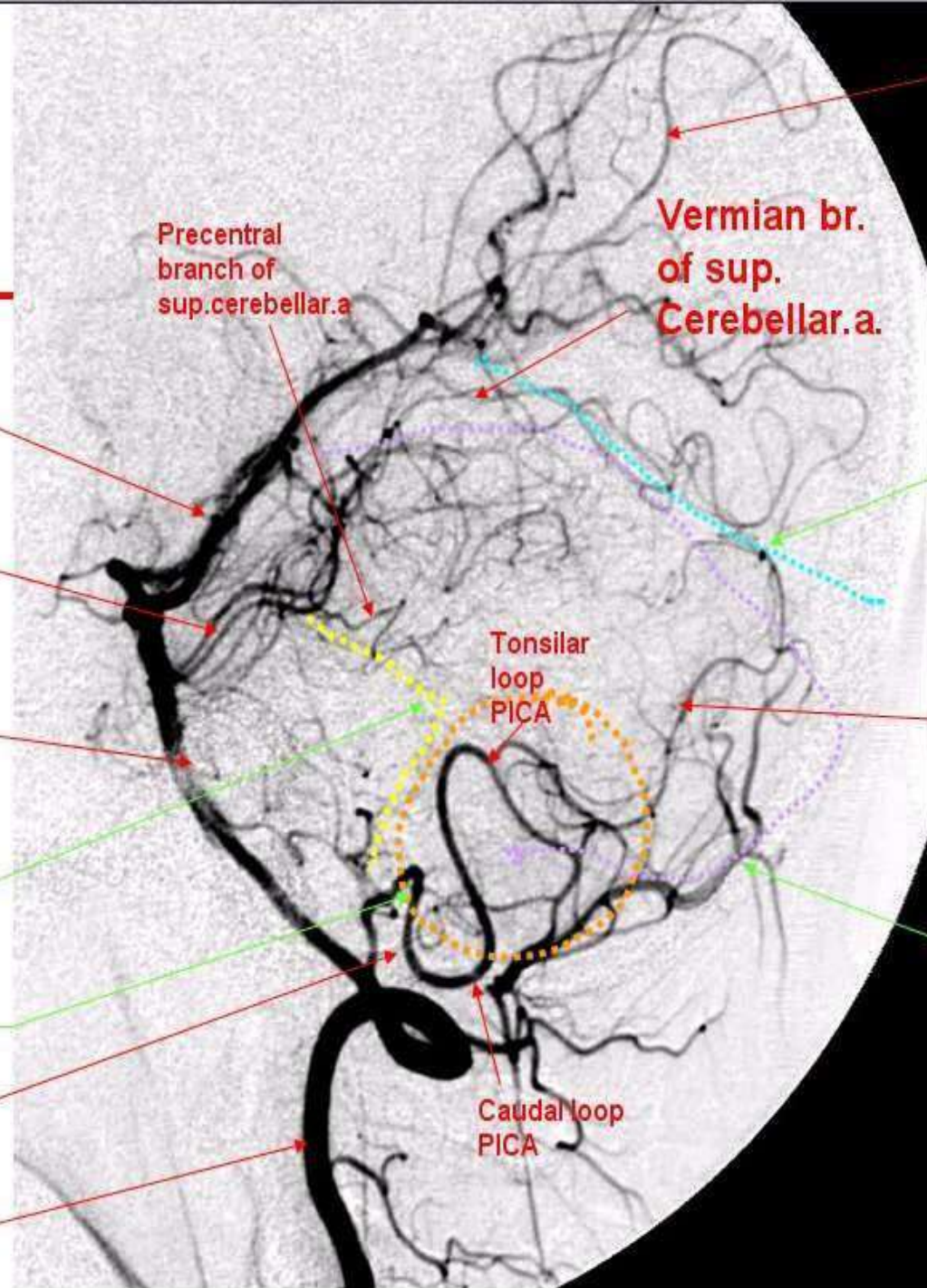
Caudal loop PICA

Calcarine a.

Tentorium cerebelli

Hemisph. Br.PICA

Projection vermis





# Blood supply of diencephalon

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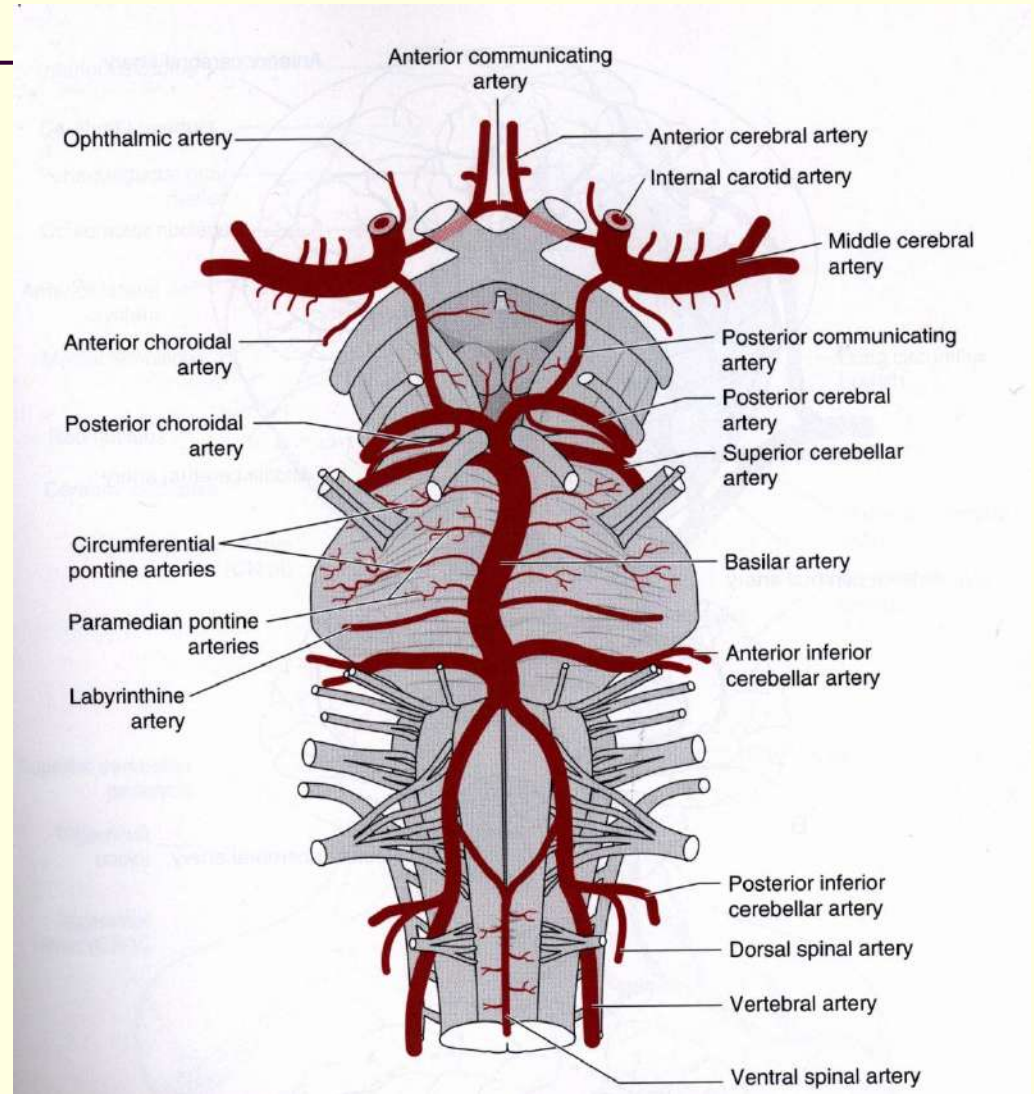
Rich blood supply ■

Thalamogeniculate branches of posterior cerebral artery ■

# Blood Supply to the Brain Stem

The brain stem (medulla, pons midbrain) receives the bulk of its blood supply from the *vertebrobasilar system*. Except for the *labyrinthine* branch, all other branches supply the brain stem and cerebellum

The *posterior cerebral* has only a small contribution, its main target being the posterior cerebral hemispheres



# Blood Supply to the Pons

---

The Pons is supplied by the;

1. The **Basilar artery**, contributions of this main artery can be further
2. Some reinforcing contributions by the **anterior inferior cerebellar** and **superior cerebellar arteries**

# Blood supply of midbrain

## Basilar artery and its branches

