Blood Supply of The Brain and Spinal Cord

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* النوتس متجمعة كمان في الأخر(تسلم إيد اللي بعتت الملاحظات واللي شالوا الهايلايت من المحاضرة ألف ومليون مرة)

Intended Learning Outcomes (ILOs)

1. Identify the blood supply of the different parts of the brain.
2. Recognize the different sources of blood supply of brain .
3. List the branches of the arteries of the brain and spinal cord.
4. Enumerate venous drainage of brain and spinal cord.
5. Explain the different lesions results from disturbances of blood supply to brain and spinal cord.

Agenda

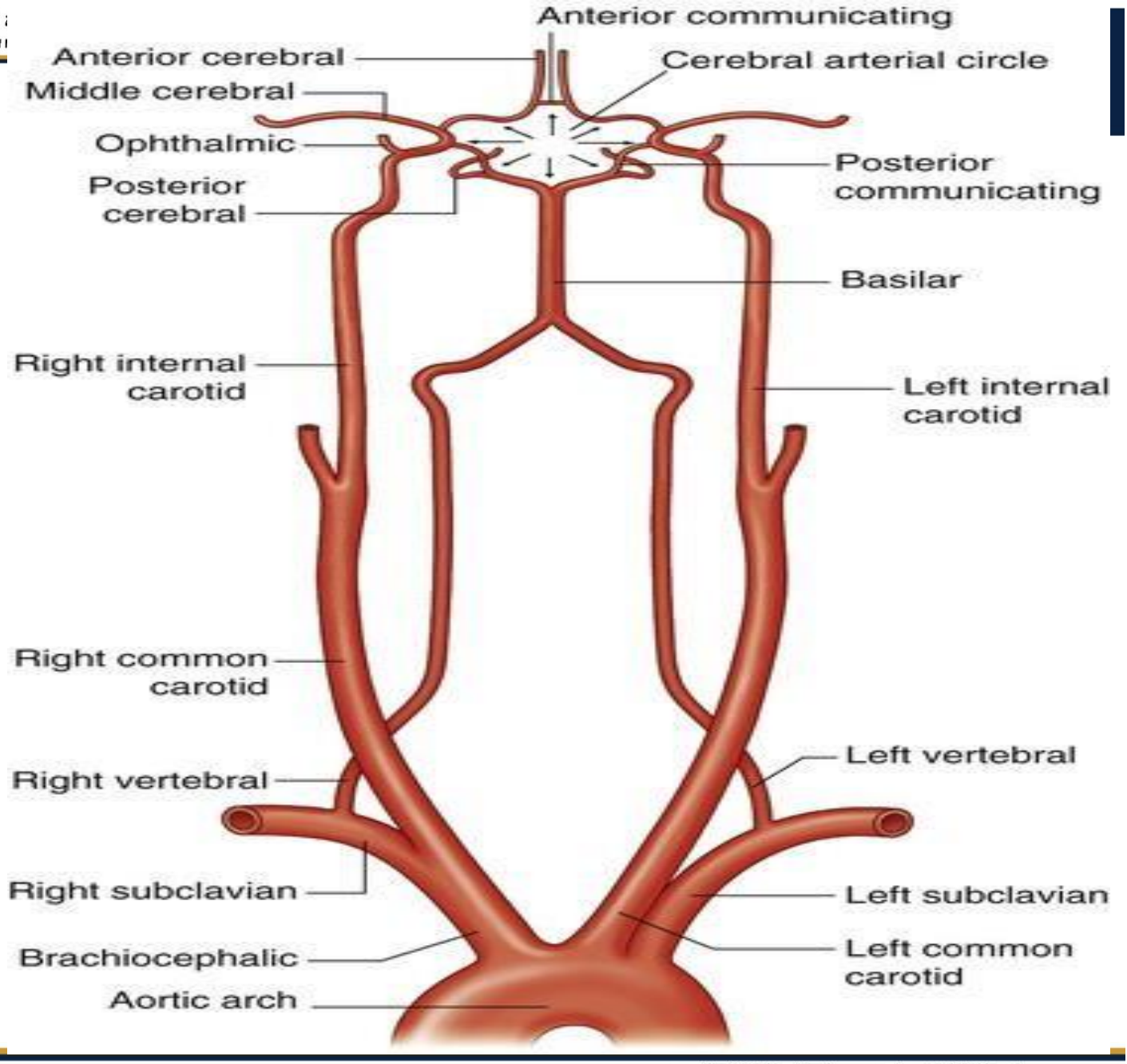
1. The vasculature of the brain
2. The vasculature of the spinal cord

* الدكتور شرح الملف كله والمتعلم عليه بالهايلايت دول أهم النقاط ومواضع الأسئلة

Blood supply of the brain
Arterial supply

The brain is supplied by two systems:

1. **Vertebrobasilar system**: the two vertebral arteries and the basilar artery.
2. **Internal carotid system**: the two internal carotid arteries.



Blood supply of the brain
Arterial supply

Internal Carotid Artery:

Origin: one of the two terminal branches of the common carotid artery at the **upper border** of the **thyroid cartilage** (disc between **C3 and C4**).

MCQ

upper border مهم نعرف انها

Course: the course of the internal carotid artery is divided into 4 parts:

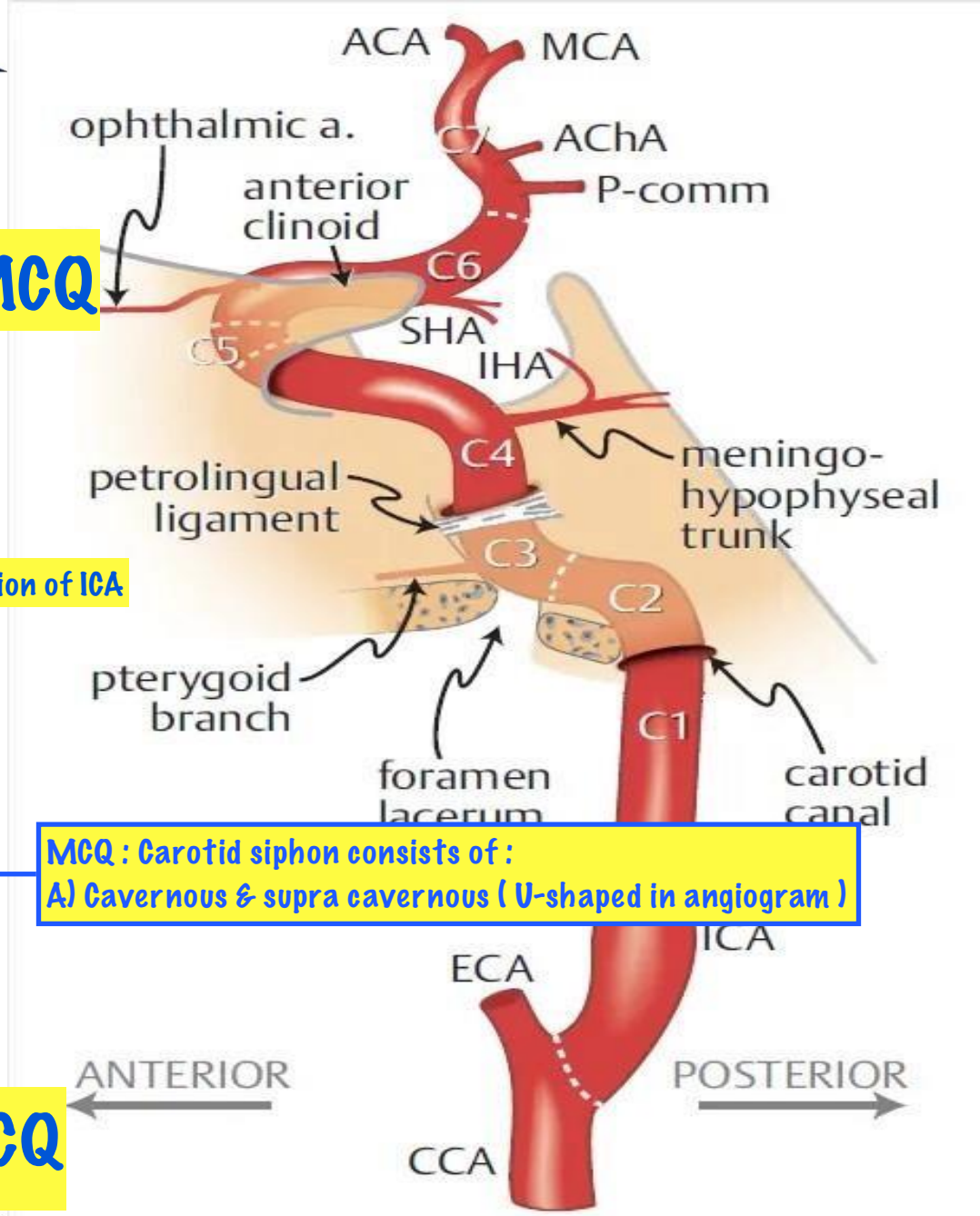
1. **Cervical part**: inside the carotid sheath with the internal jugular vein & the vagus nerve. * Cervical & petrous part are important for protection of ICA
2. **Petrous part:** in the carotid canal in the petrous part of the temporal bone.
3. **Cavernous part:** passes forward inside the cavernous sinus, then pierces its roof to form the supracavernous part.
4. **Supracavernous part:** passes backward above the cavernous sinus.

The **cavernous** and **supracavernous** parts form the **carotid siphon** (**U-shaped in the angiogram**)

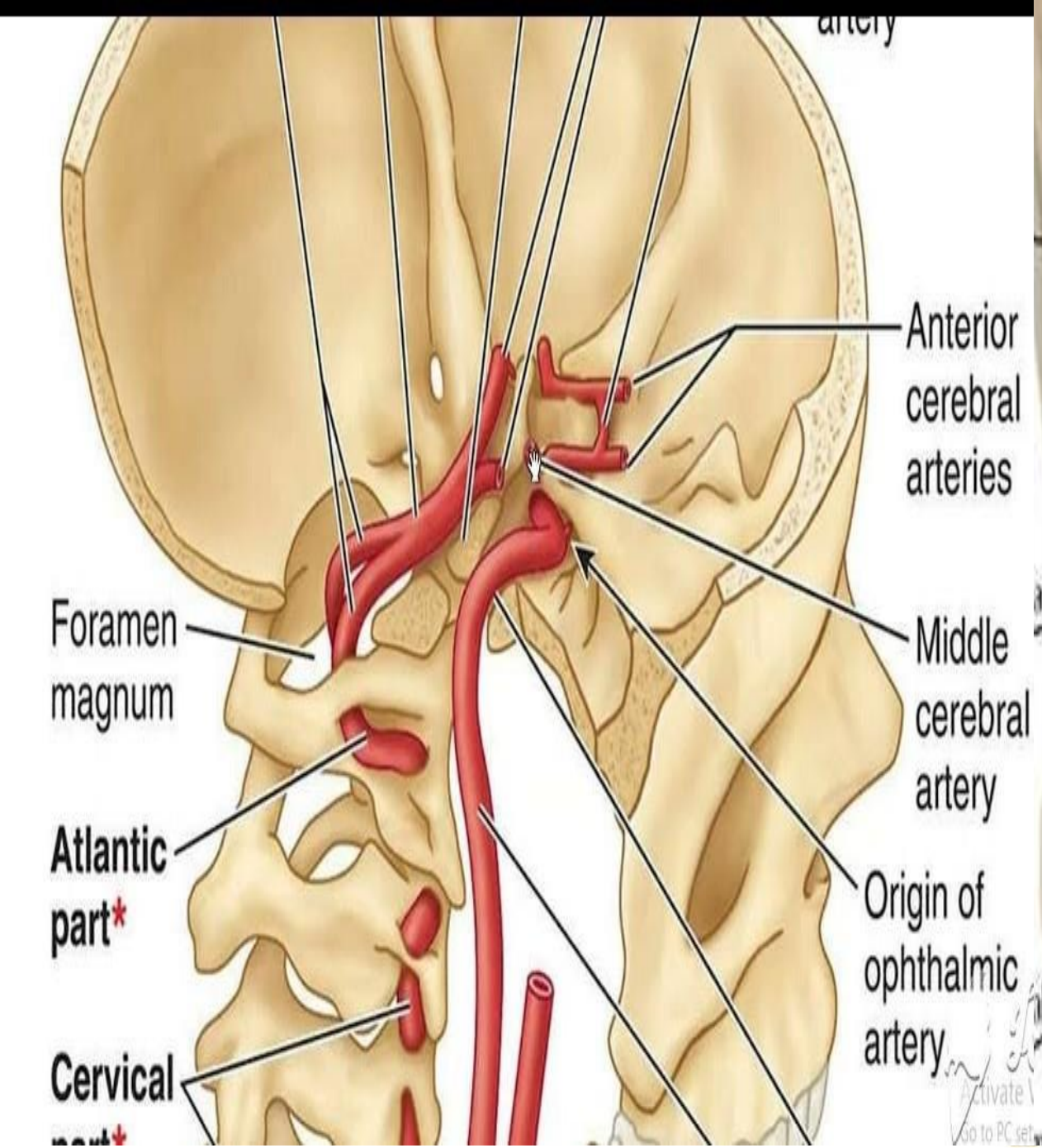
MCQ

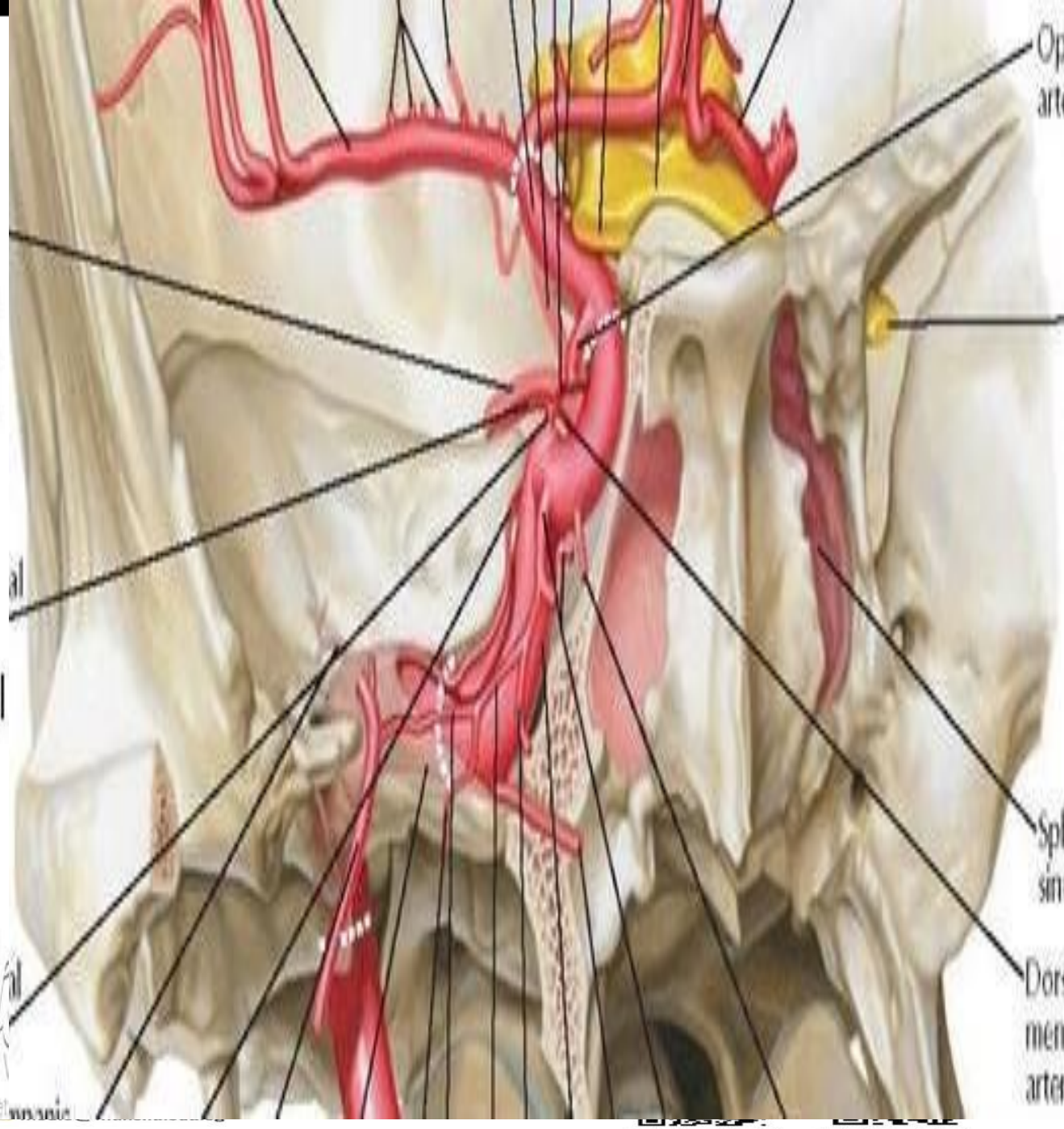
Termination: **lateral to optic chiasma** by **dividing into anterior & middle cerebral arteries.**

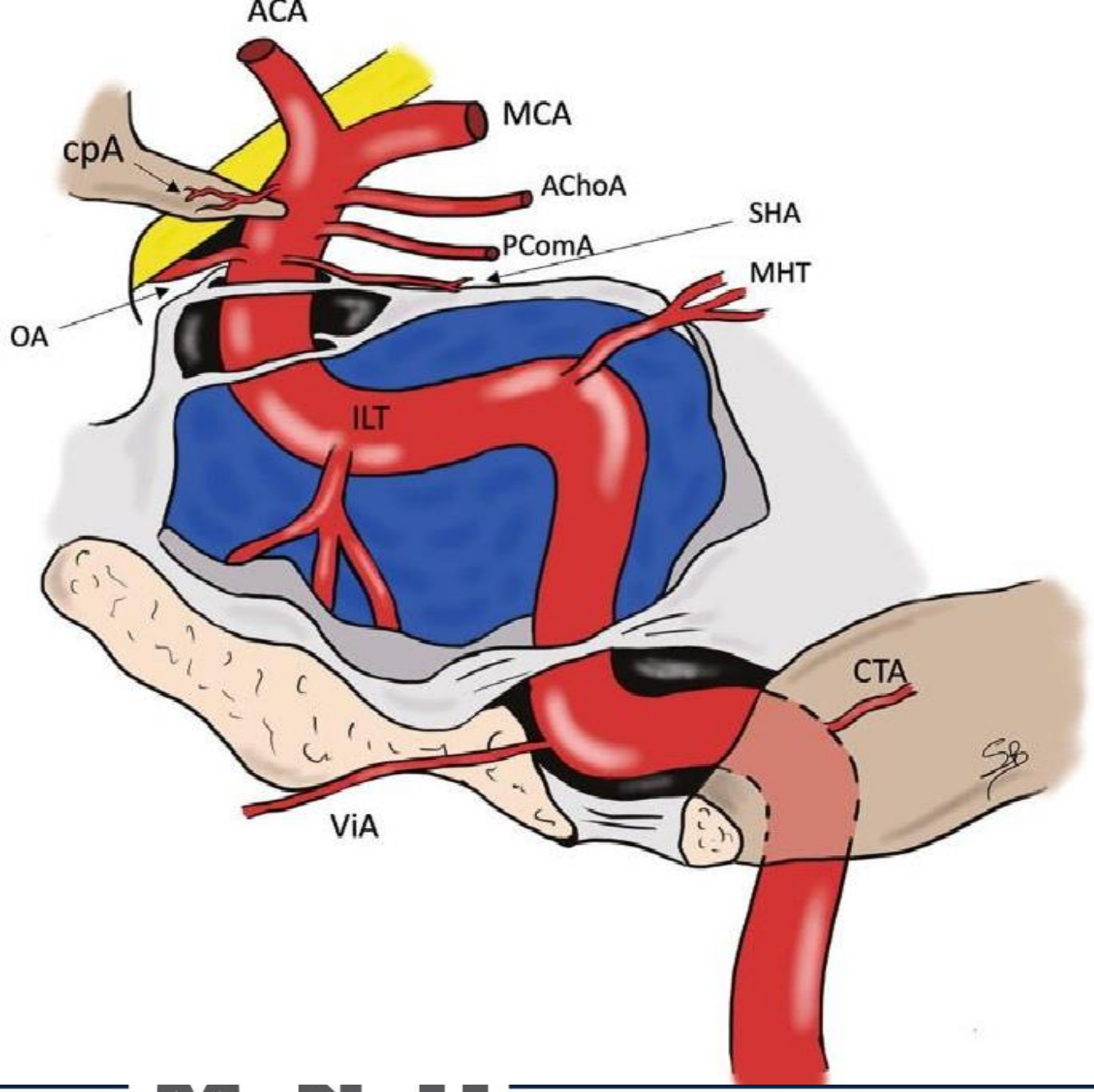
MCQ

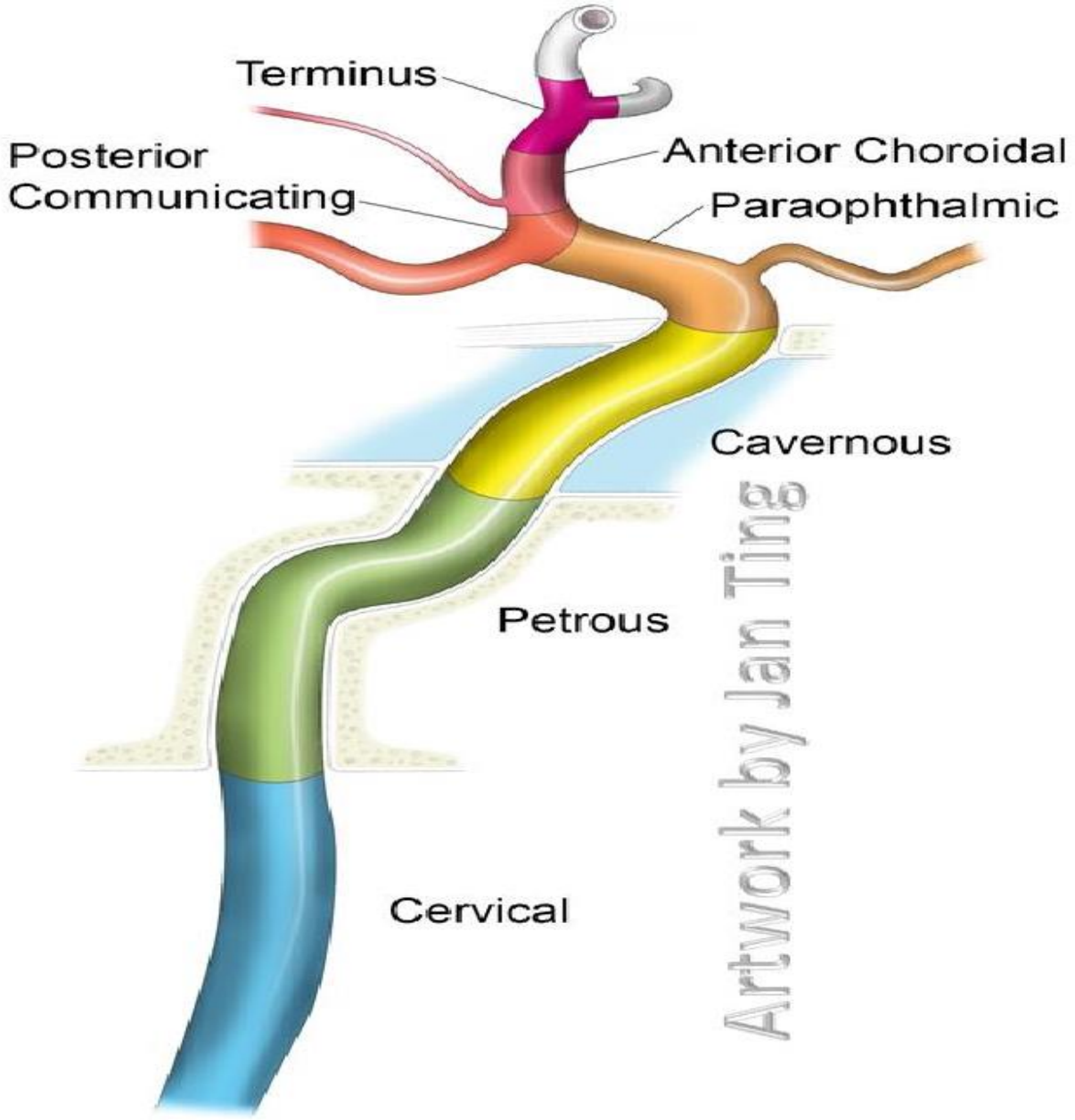


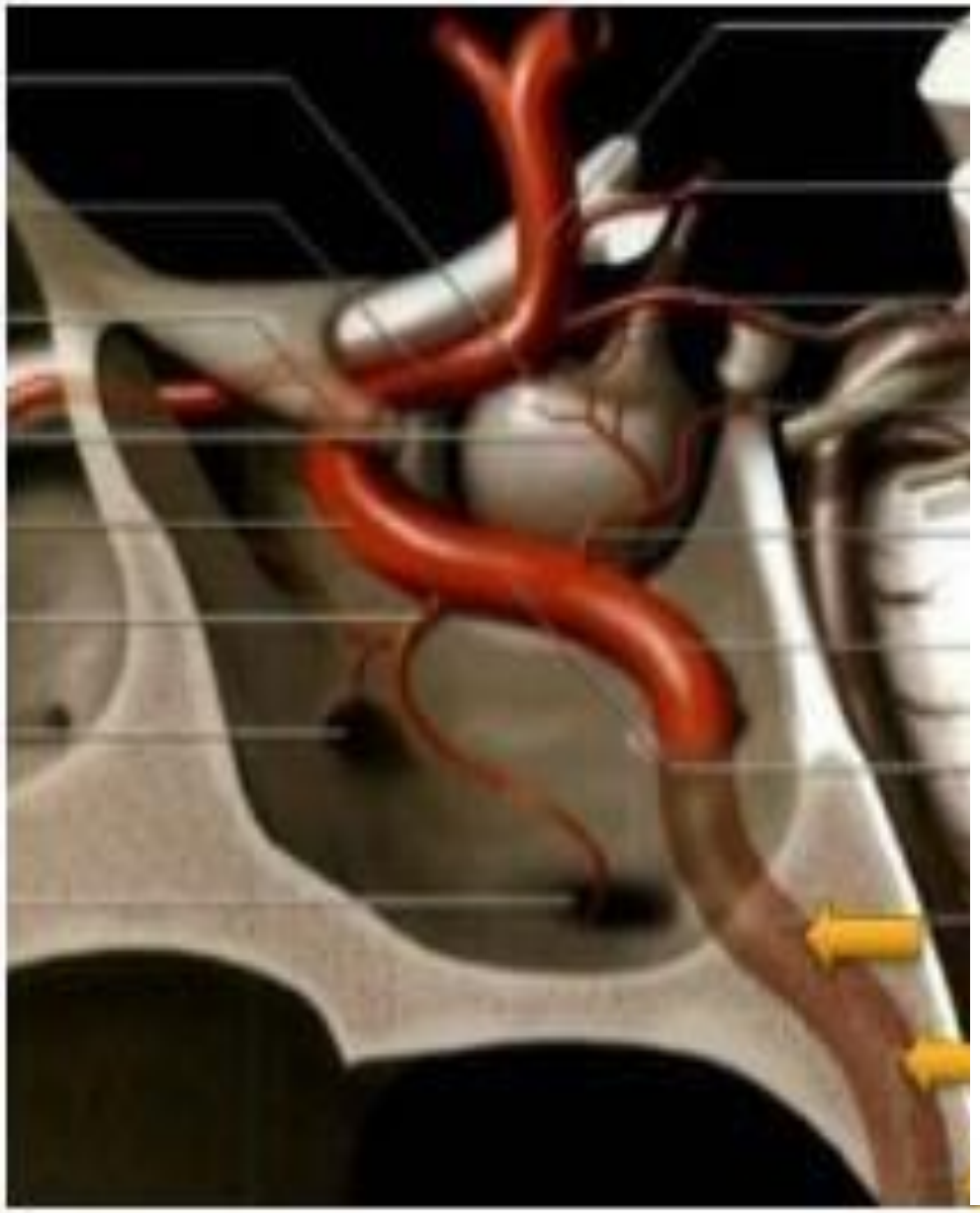
MCQ : Carotid siphon consists of :
A) Cavernous & supra cavernous (U-shaped in angiogram)


Anterior cerebral arteries
Middle cerebral artery
Origin of ophthalmic artery
Foramen magnum
Atlantic part*
Cervical part*




ACA
MCA
cpA
AChoA
SHA
PComA
MHT
OA
ILT
CTA
ViA


Terminus
Posterior Communicating
Anterior Choroidal
Paraophthalmic
Cavernous
Petrous
Cervical
Artwork by Jan Ting



مهمة OSPE

الدكتور نبه عليها

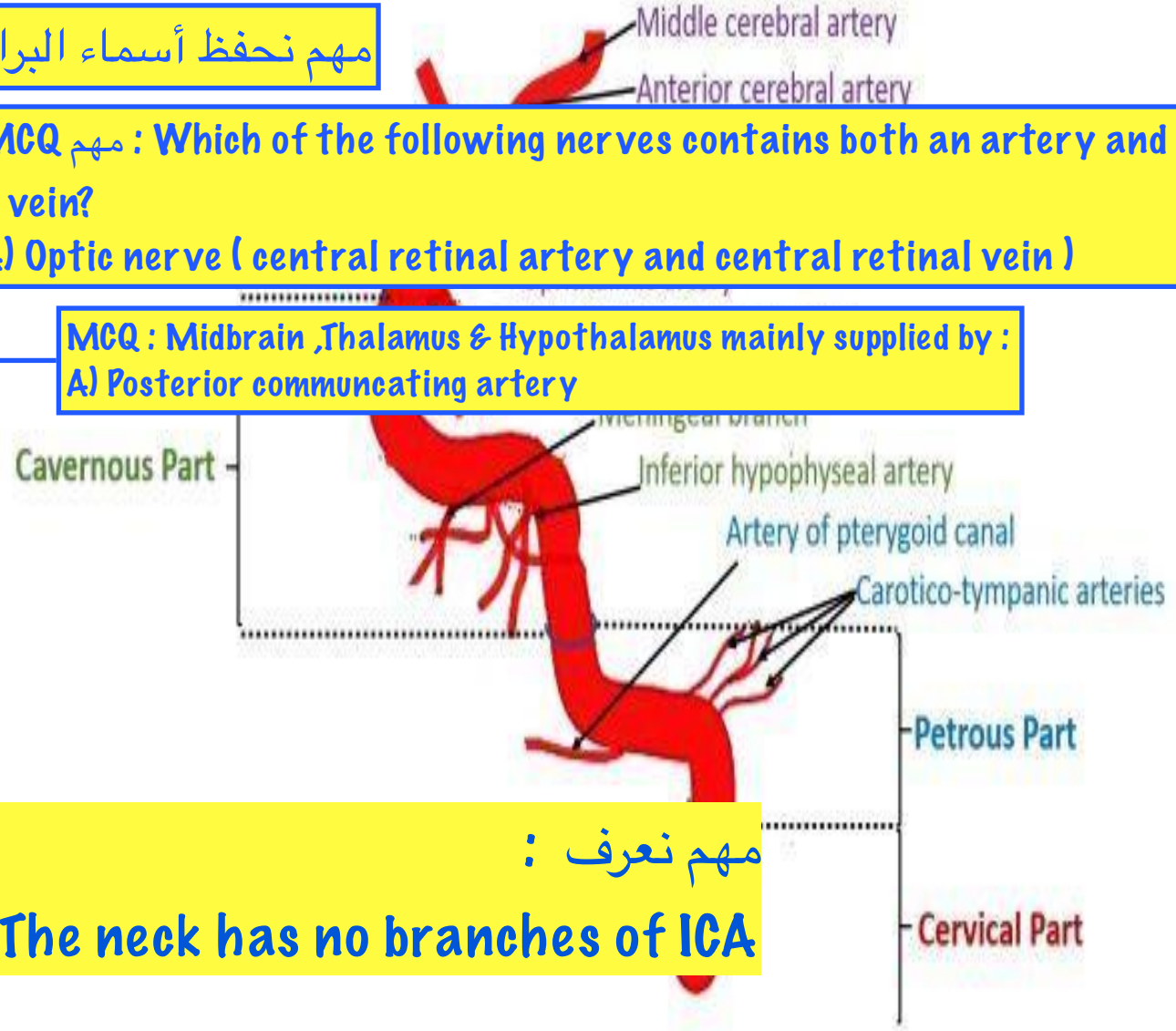
Branches of internal carotid artery:

مهم نحفظ أسماء البرانشات

1. **Hypophyseal branches**: superior and inferior. They supply the pituitary gland.
2. **Ophthalmic artery**: enters the orbit through the optic canal.
3. **Posterior communicating artery**: joins the posterior cerebral artery and supplies the: Midbrain, thalamus and hypothalamus.
   - Internal capsule: posterior part of the genu & anterior third of the posterior limb.
4. **Anterior choroidal artery** supplies the:
   - Posterior two-thirds of the posterior limb of the internal capsule.
   - **Choroid plexus** of the inferior horn of the lateral ventricle.
   - Optic tract and lateral geniculate body.
   - Tail of the caudate nucleus and amygdaloid nucleus.
5. **Two terminal branches**: anterior cerebral artery and middle cerebral artery.

MCQ مهم : Which of the following nerves contains both an artery and a vein?
A) Optic nerve (central retinal artery and central retinal vein)

MCQ : Midbrain ,Thalamus & Hypothalamus mainly supplied by :
A) Posterior communcating artery



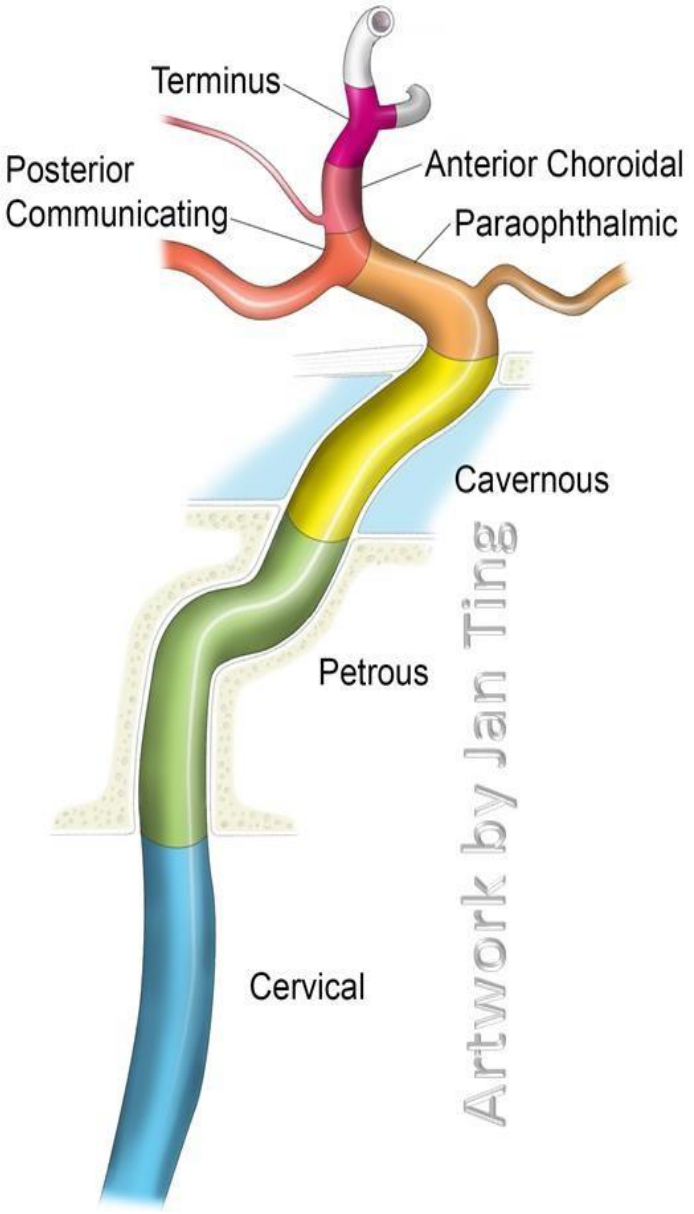
مهم نعرف :

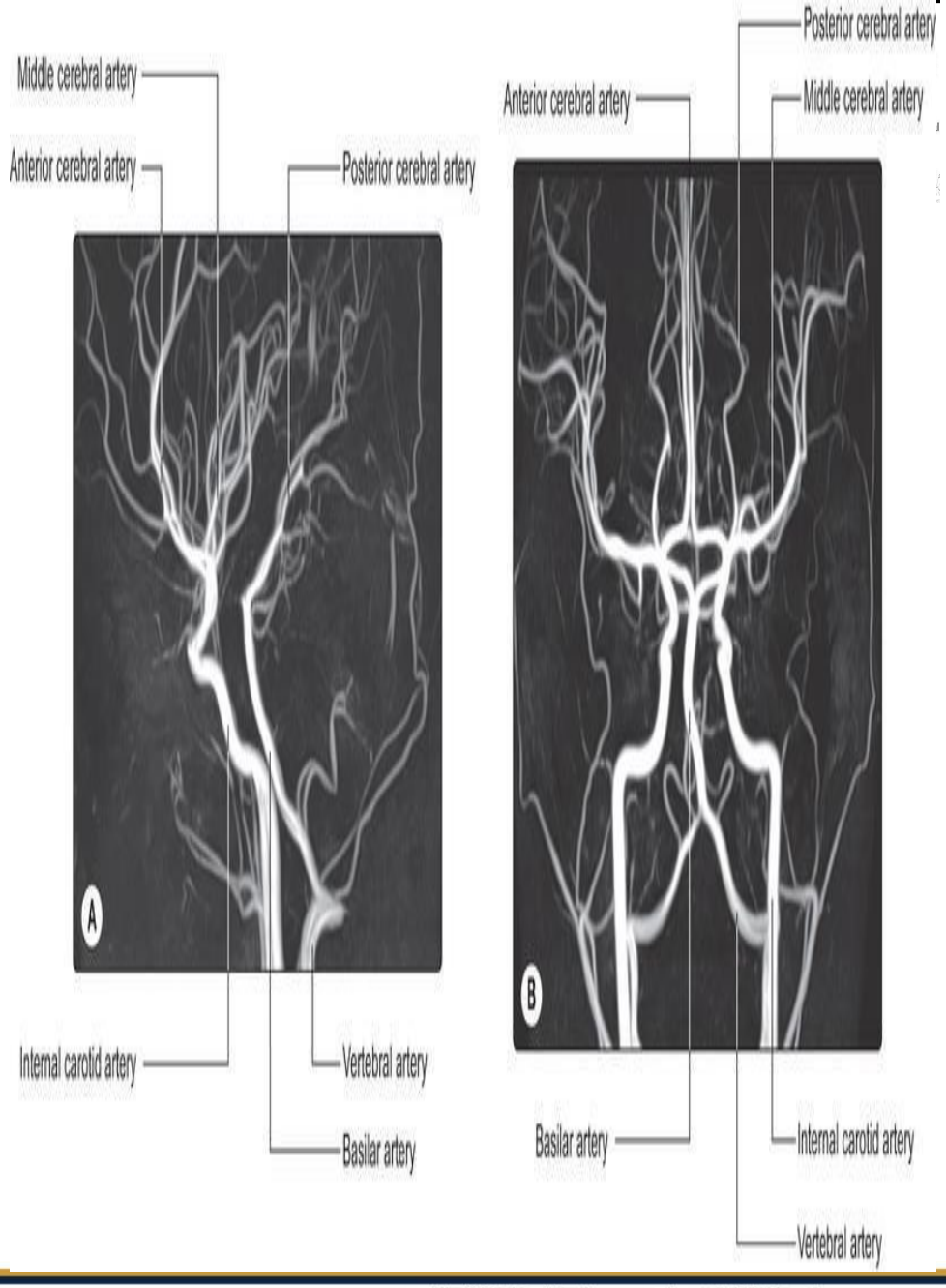
* The neck has no branches of ICA

Once the carotid artery enters the carotid canal it has a very tortuous course – six bends in all before its terminal division.

The reason for this tortuosity is unknown but it may have a role in reducing the pulsating force of the blood supply to the brain.

The cavernous and supraglenoid portions of the internal carotid artery are referred to as the carotid siphon.





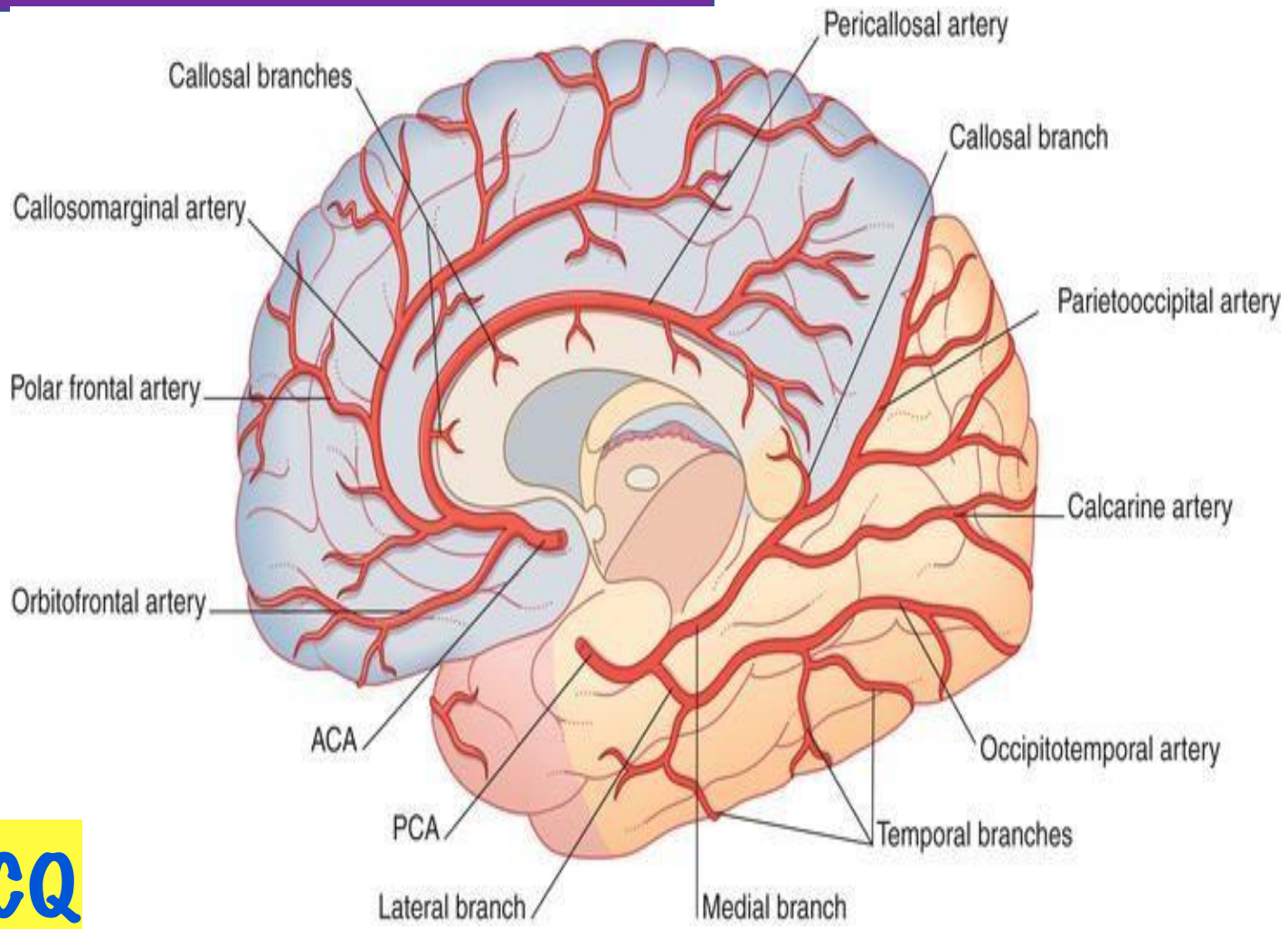
Anterior cerebral artery (ACA)

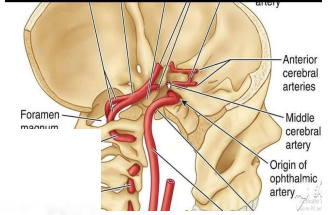
ORIGIN: one of the two terminal branches of the internal carotid artery (it is the **smaller one**).

Course: It is joined with the opposite one by the anterior communicating artery.

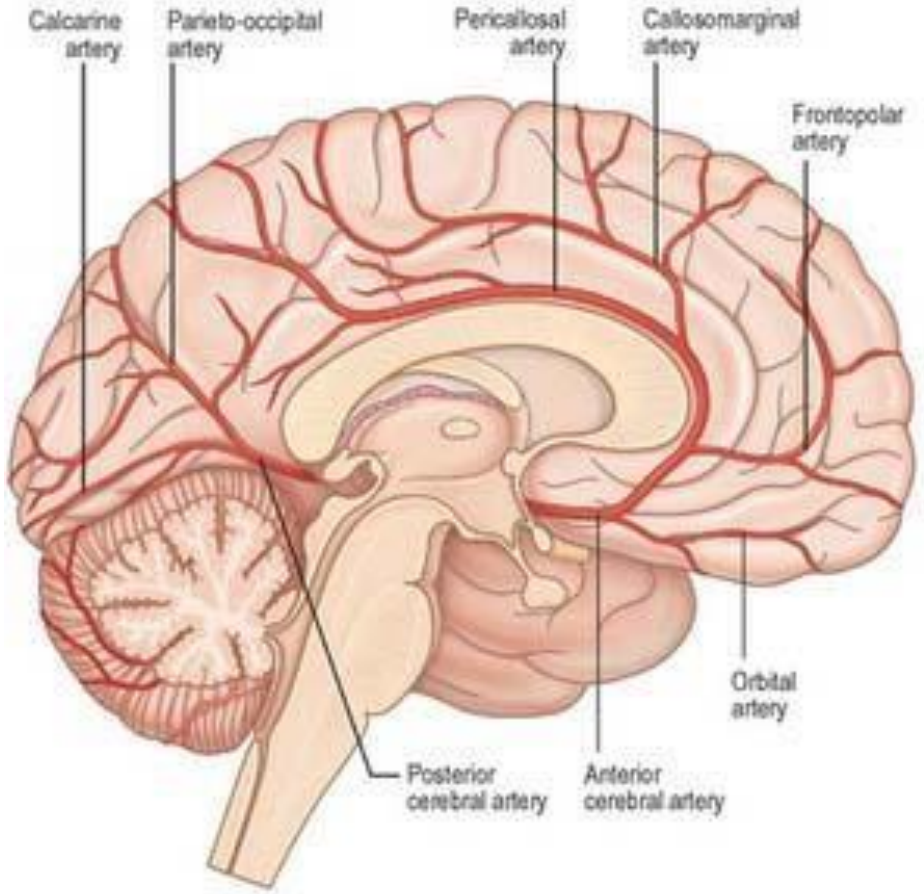
- It passes around the genu of the corpus callosum and continues backward on the upper surface of the corpus callosum in the callosal sulcus.
- It **ends at** the **splenium** by **anastomosing** with branches of the **posterior cerebral artery.**

MCQ

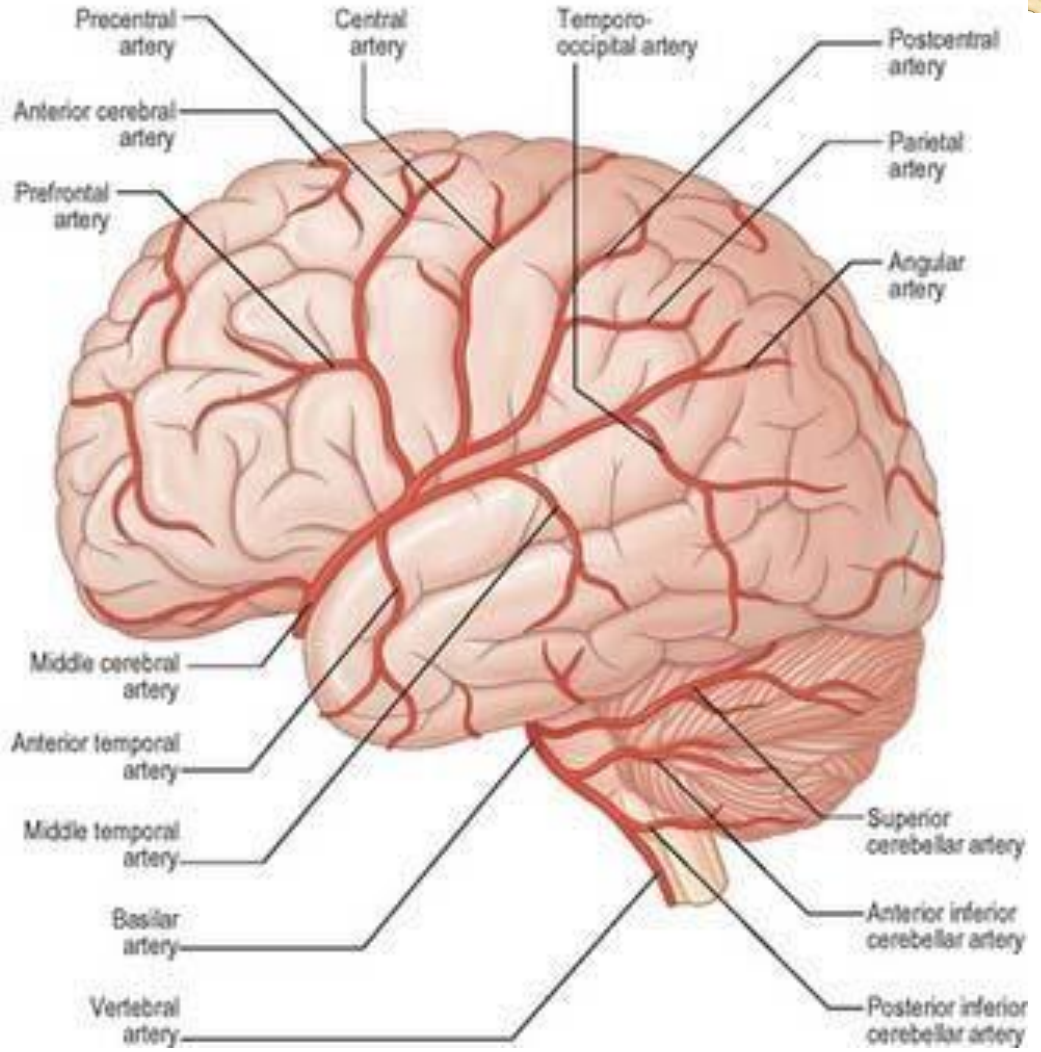


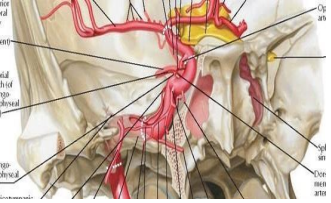

Anterior cerebral arteries
Middle cerebral artery
Origin of ophthalmic artery
Foramen magnum

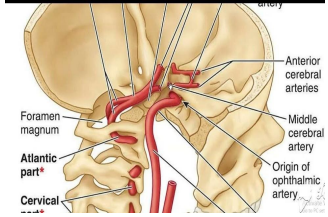
A


Calcarine artery
Parieto-occipital artery
Pericallosal artery
Callosomarginal artery
Frontopolar artery
Orbital artery
Posterior cerebral artery
Anterior cerebral artery

B


Precentral artery
Central artery
Temporo-occipital artery
Postcentral artery
Anterior cerebral artery
Parietal artery
Prefrontal artery
Angular artery
Middle cerebral artery
Anterior temporal artery
Middle temporal artery
Superior cerebellar artery
Basilar artery
Anterior inferior cerebellar artery
Vertebral artery
Posterior inferior cerebellar artery





Anterior cerebral artery (ACA)

Branches:

1. Cortical branches: supply:

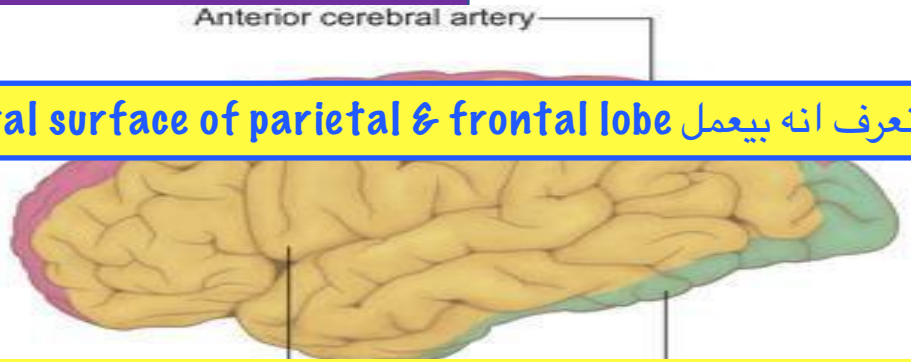
- Upper one inch of the lateral surface of the frontal and parietal lobes. It supplies the leg area of the motor and sensory cortical areas.
- Medial surface of the frontal and parietal lobes.
- Medial half of the orbital surface.

2. Central branches: supply: (4 anterior)

- Anterior limb of the internal capsule.
- Anterior part of the genu of the internal capsule.
- Anterior part of corpus striatum: lentiform nucleus & head of caudate nucleus.
- Anterior part of the hypothalamus.

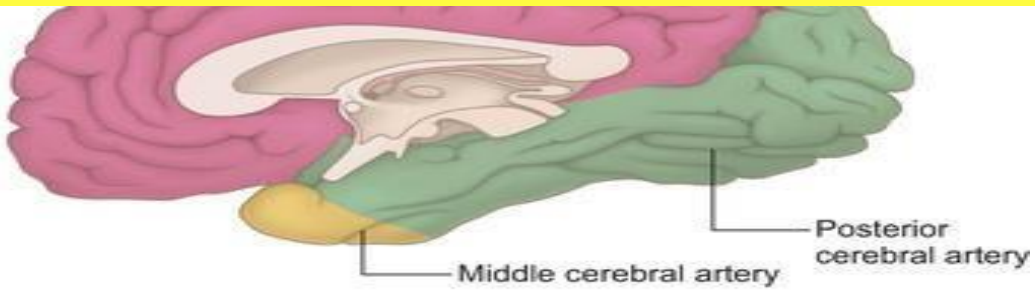
3. Callosal branches: to the entire corpus callosum.

supply to lateral surface of parietal & frontal lobe مهم نعرف انه بيعمل



MCQ notes :

- Anterior Choroidal Artery → Branch of Internal Carotid Artery (ICA)
- Anterior Inferior Cerebellar Artery (AICA) → Branch of Basilar Artery
- Posterior Inferior Cerebellar Artery (PICA) → Supplies 4th Ventricle
- Posterior Choroidal Artery → Supplies 3rd & Lateral Ventricles



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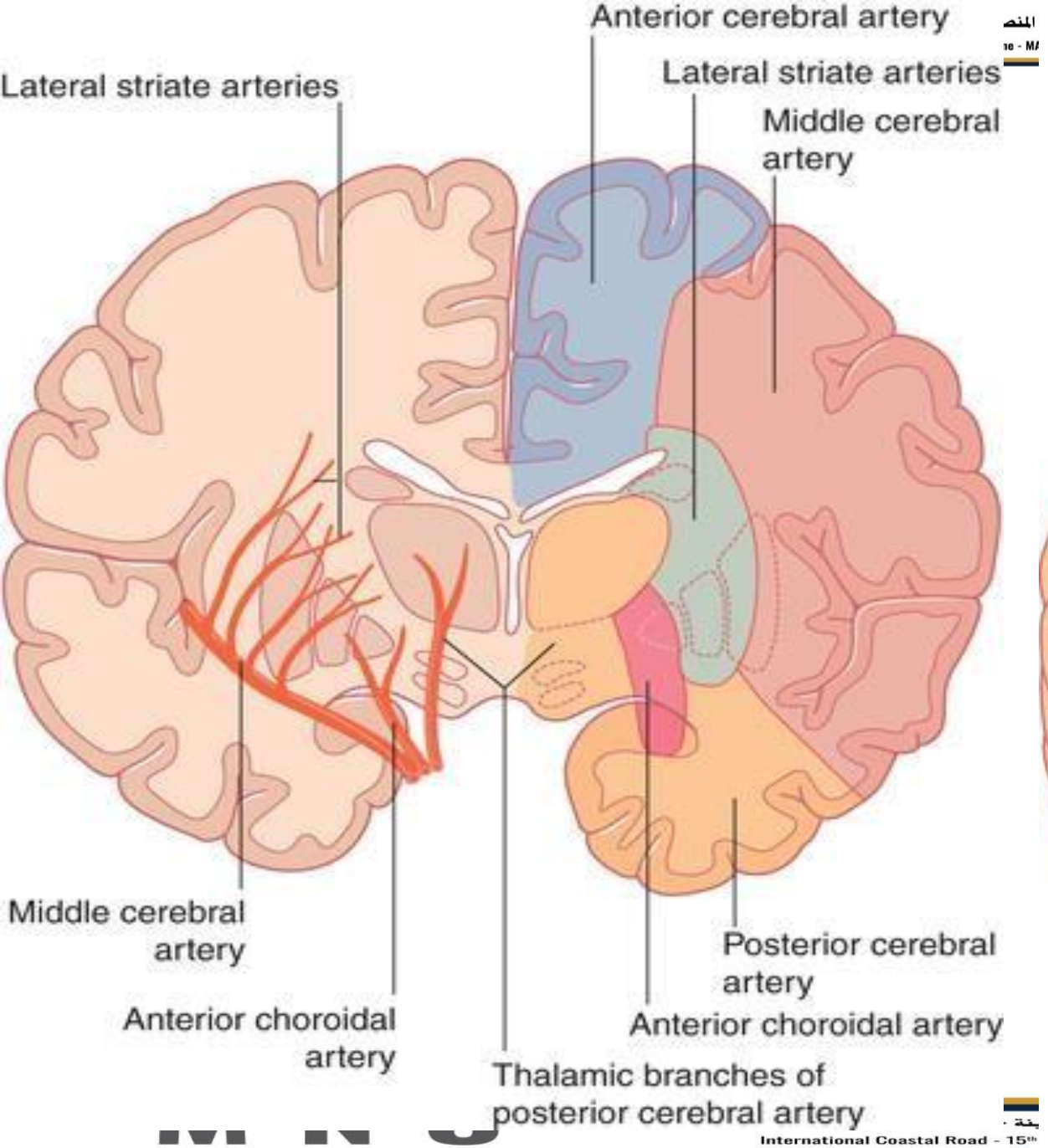
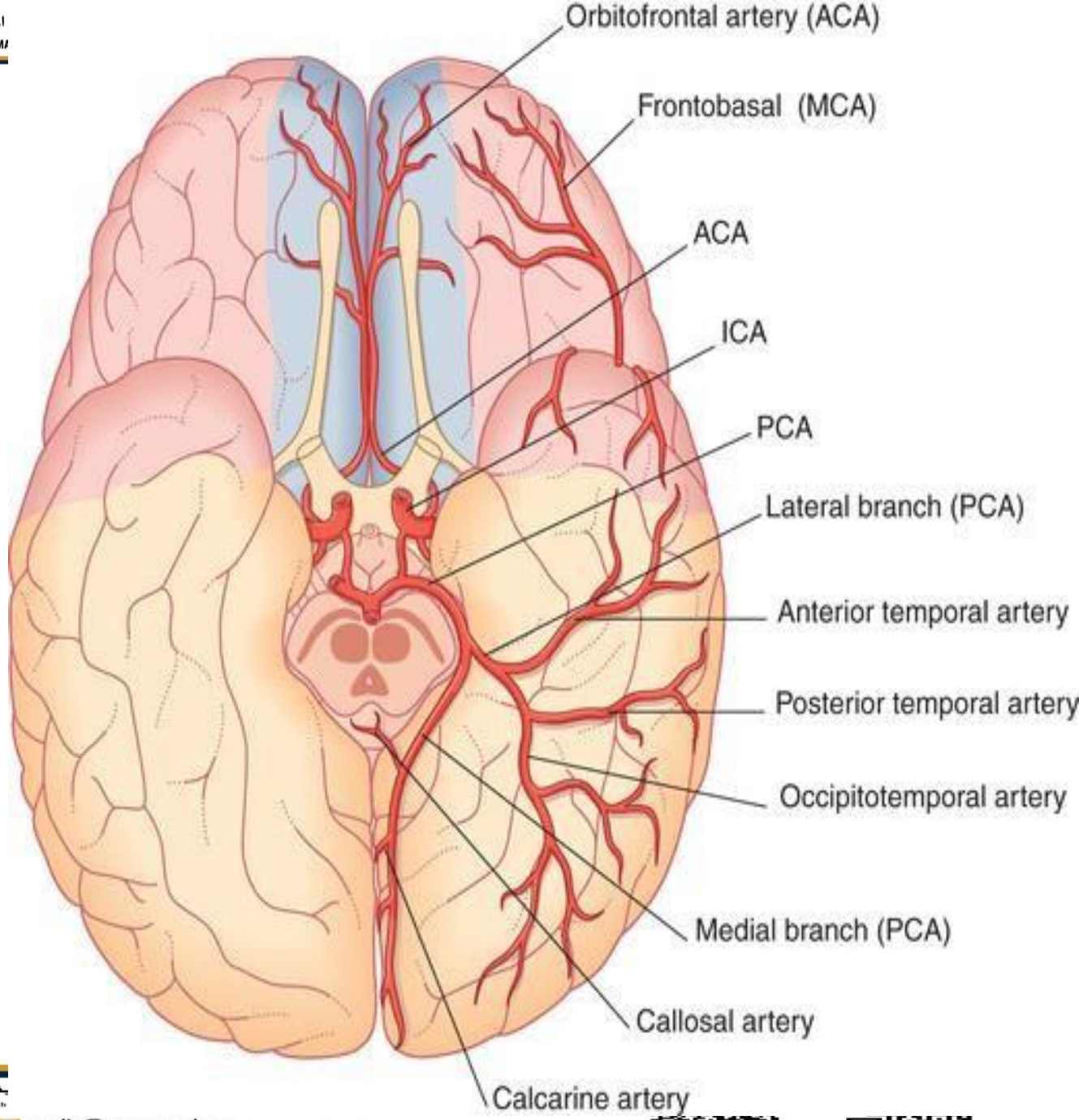
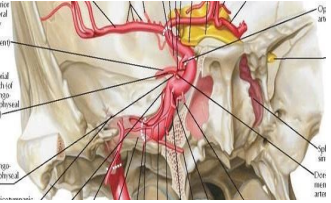
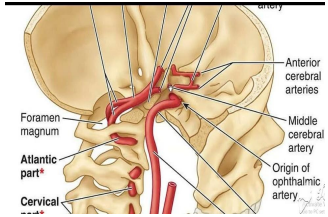








Anterior communicating artery

Anteromedial arteries

Anterior perforated substance

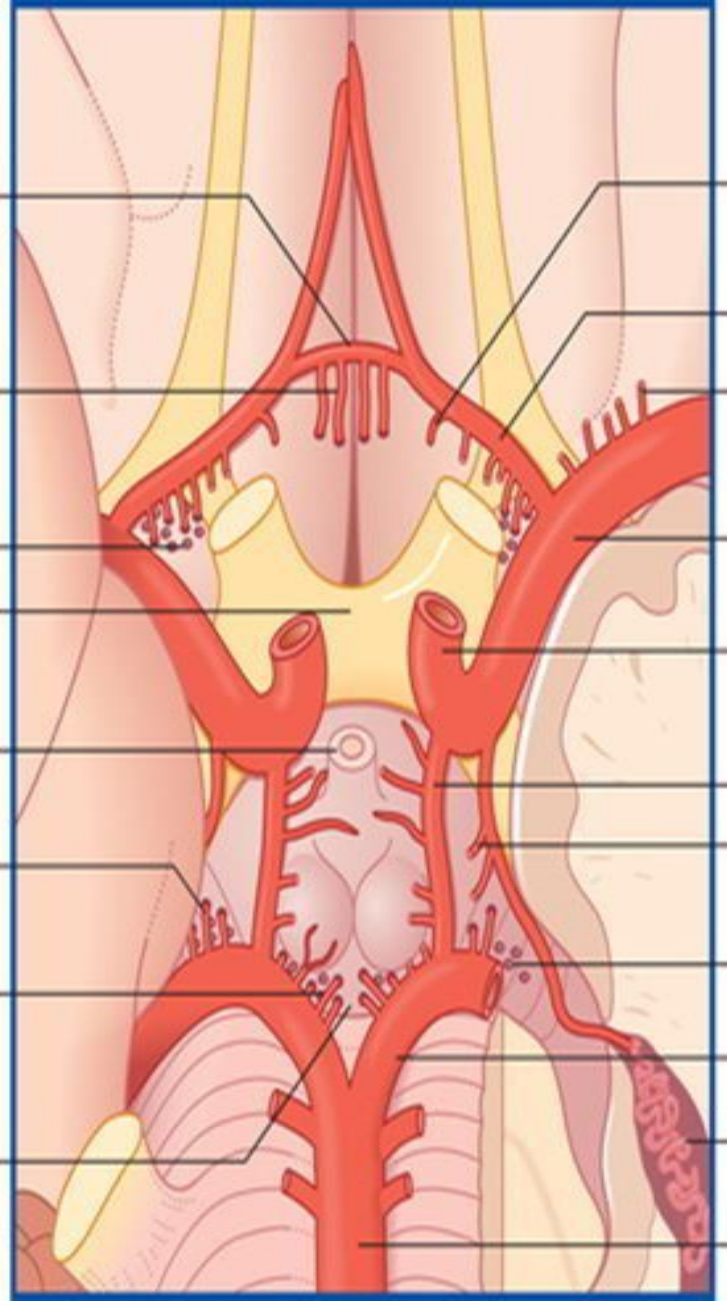
Optic chiasm

Pituitary stalk

Posterolateral central arteries (including thalamogeniculate artery)

Posteromedial central arteries (including thalamoperforating artery)

Interpeduncular fossa (floor of hypothalamus)



Medial striate artery

ACA

Anterolateral central arteries (lateral striate)

MCA

ICA

Posterior communicating artery

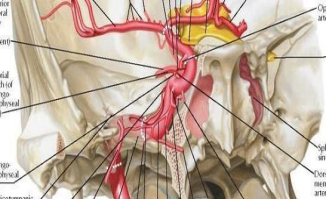
Internal capsular branches of anterior choroidal artery

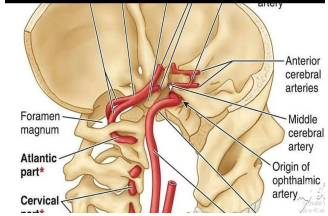
Posterior perforated substance

PCA

Choroid plexus of temporal lobe

Basilar artery





Anterior cerebral artery (ACA)

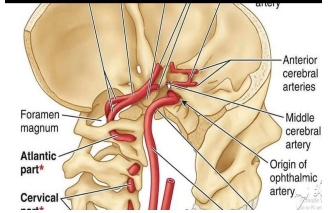
Clinical Note: مهمة جداااا جداااا

Occlusion of the anterior cerebral artery causes:

1. Affection of the **paracentral lobule**:

- **Contralateral paralysis** of the **leg** muscles.
- **Contralateral somatosensory loss** in the **leg.**

2. Affection of the **corpus callosum**: **callosal apraxia.**

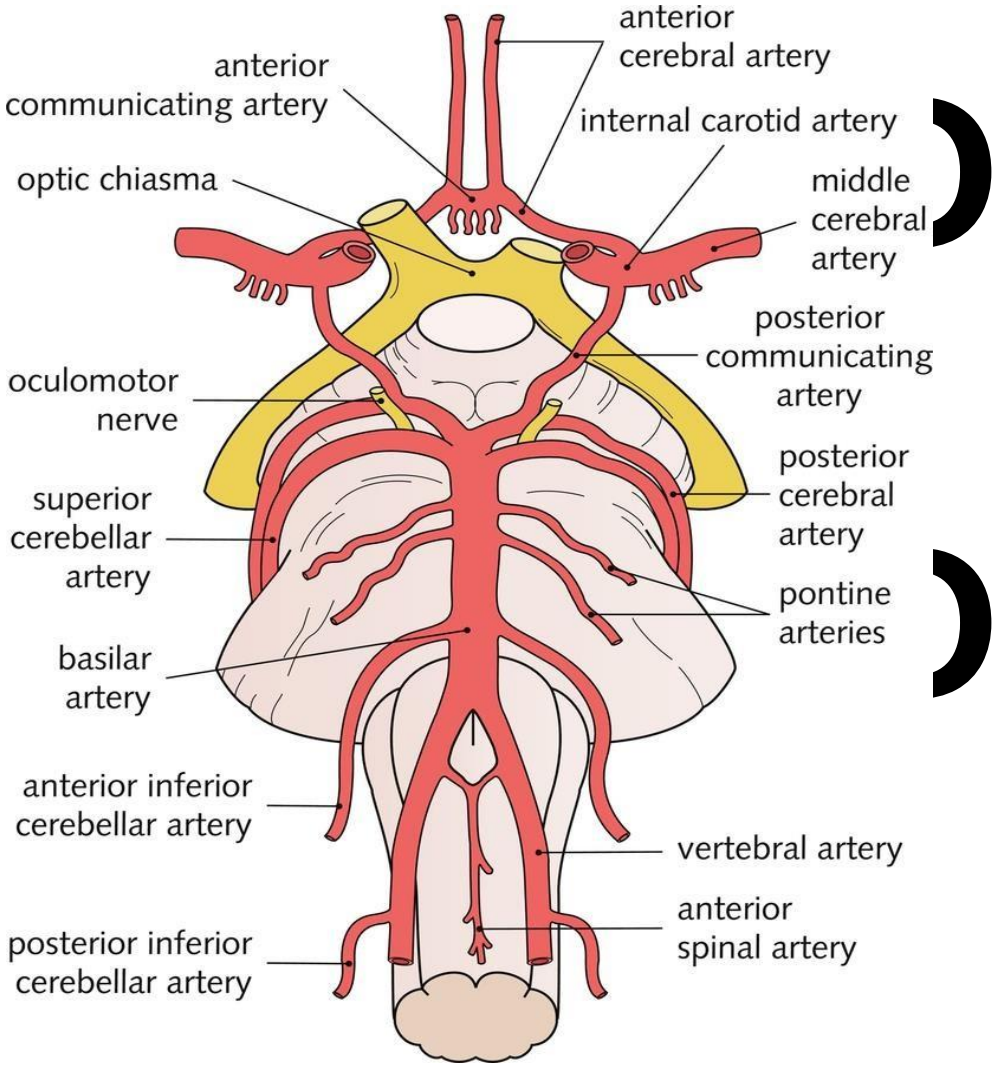


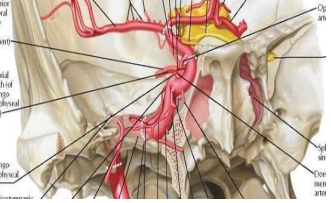
Posterior cerebral artery (PCA)

Origin: by the **bifurcation** of the **basilar artery** at the **upper border of the pons.** ! مهم

Course: ! مهم

- It passes backward around the lateral side of the midbrain to reach the splenium of the corpus callosum where it divides into temporal, calcarine and parieto-occipital branches.
- The temporal branches are distributed over the inferior surface of the temporal lobe.
- **The other branches** run in the corresponding sulci and anastomose with branches of the anterior cerebral artery.
- It is joined with the internal carotid artery by the posterior communicating artery.
- It is separated from the superior cerebellar artery by the oculomotor and trochlear nerves.





Posterior cerebral artery (PCA)

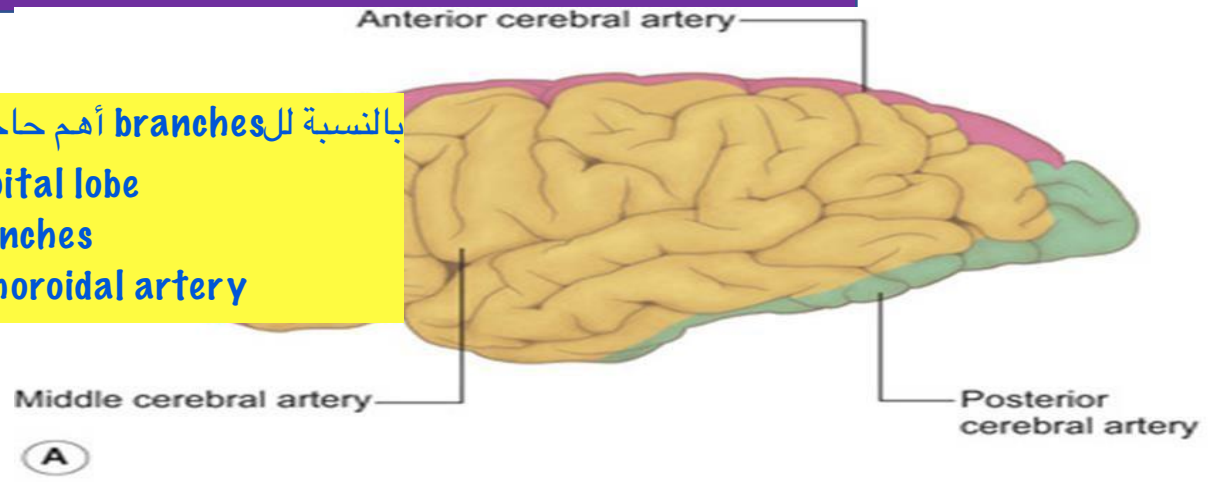
Branches:

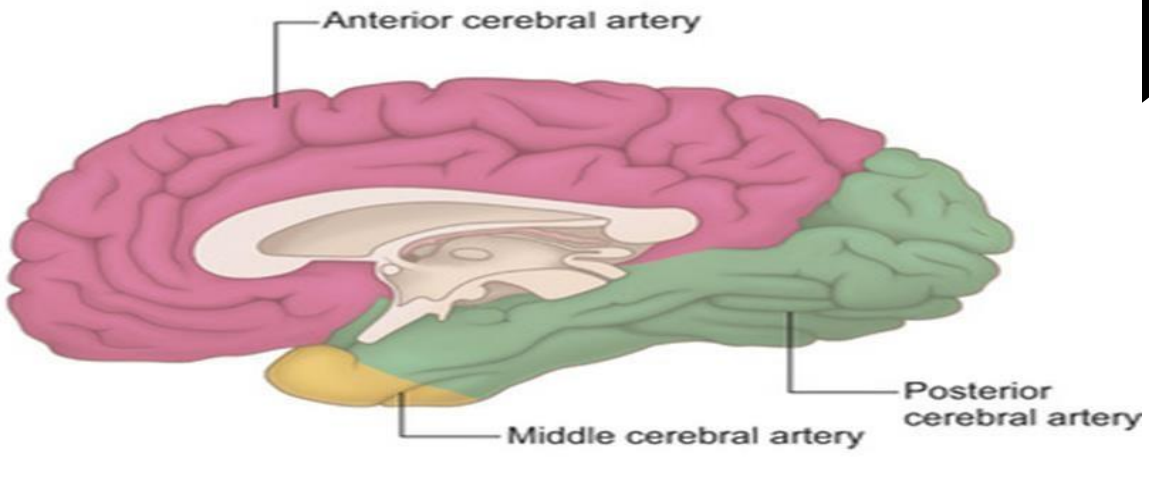
1. Cortical branches: supply:

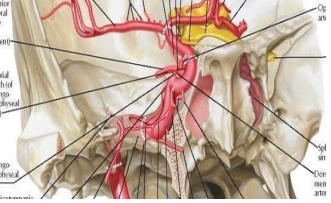
- Lower inch of the lateral surface (inferior temporal gyrus).
- All aspects of the **occipital lobe**. It supplies the primary visual area (area 17) and the visual association areas (areas 18 & 19).
- Medial and inferior surfaces of the temporal lobe except the temporal pole.

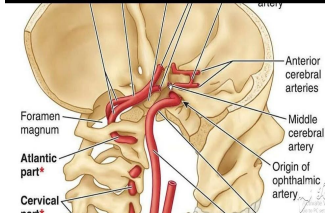
2. Central branches: enter through the posterior perforated substance and supply: **Thalamus** and the **hypothalamus.** **Midbrain.**

بالنسبة للbranches أهم حاجة :
- supply occipital lobe
- central branches
- posterior choroidal artery









Posterior cerebral artery (PCA)

Posterior choroidal artery: supplies:

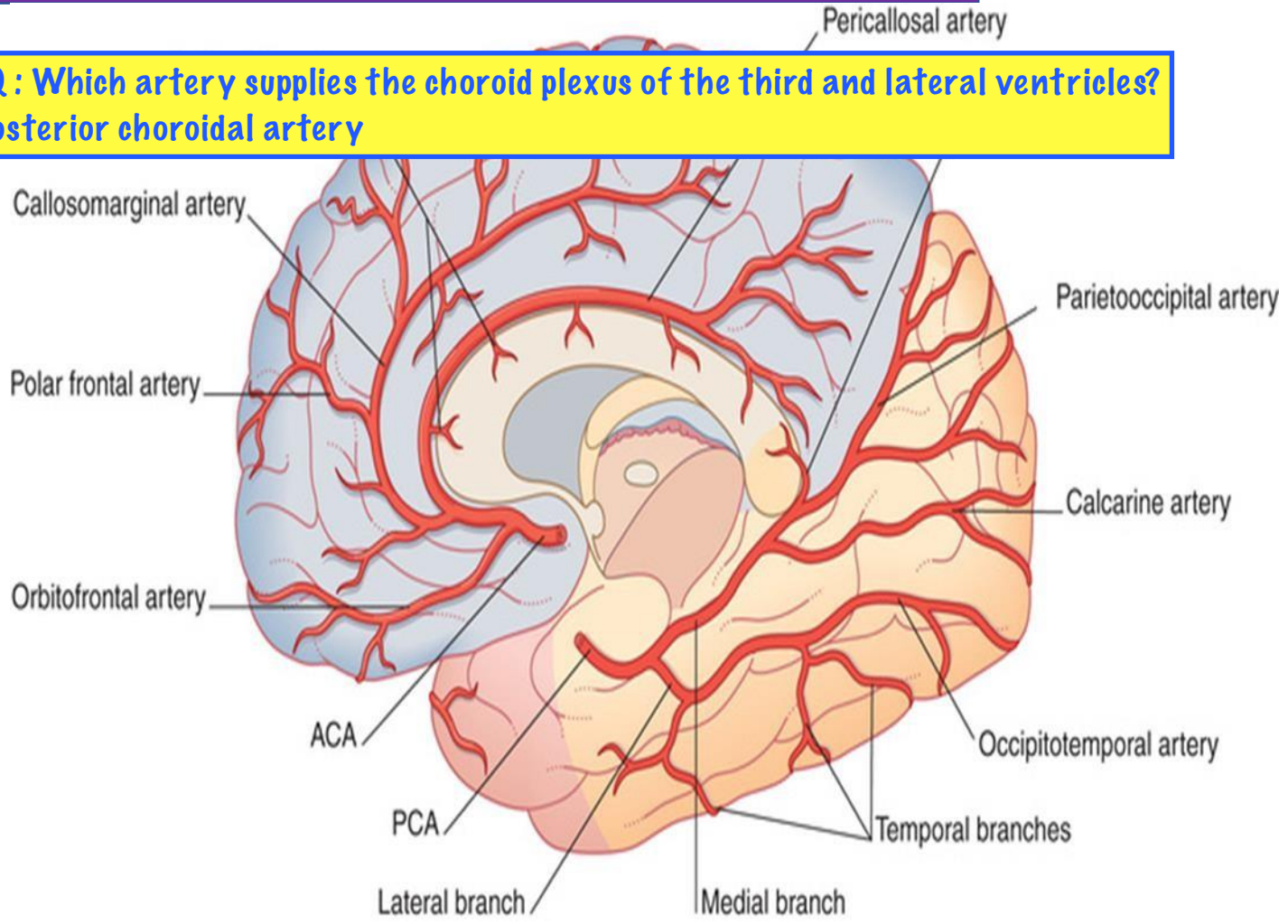
- **Choroid plexus of the third and lateral ventricles.**
- **Thalamus**
- **Midbrain.**

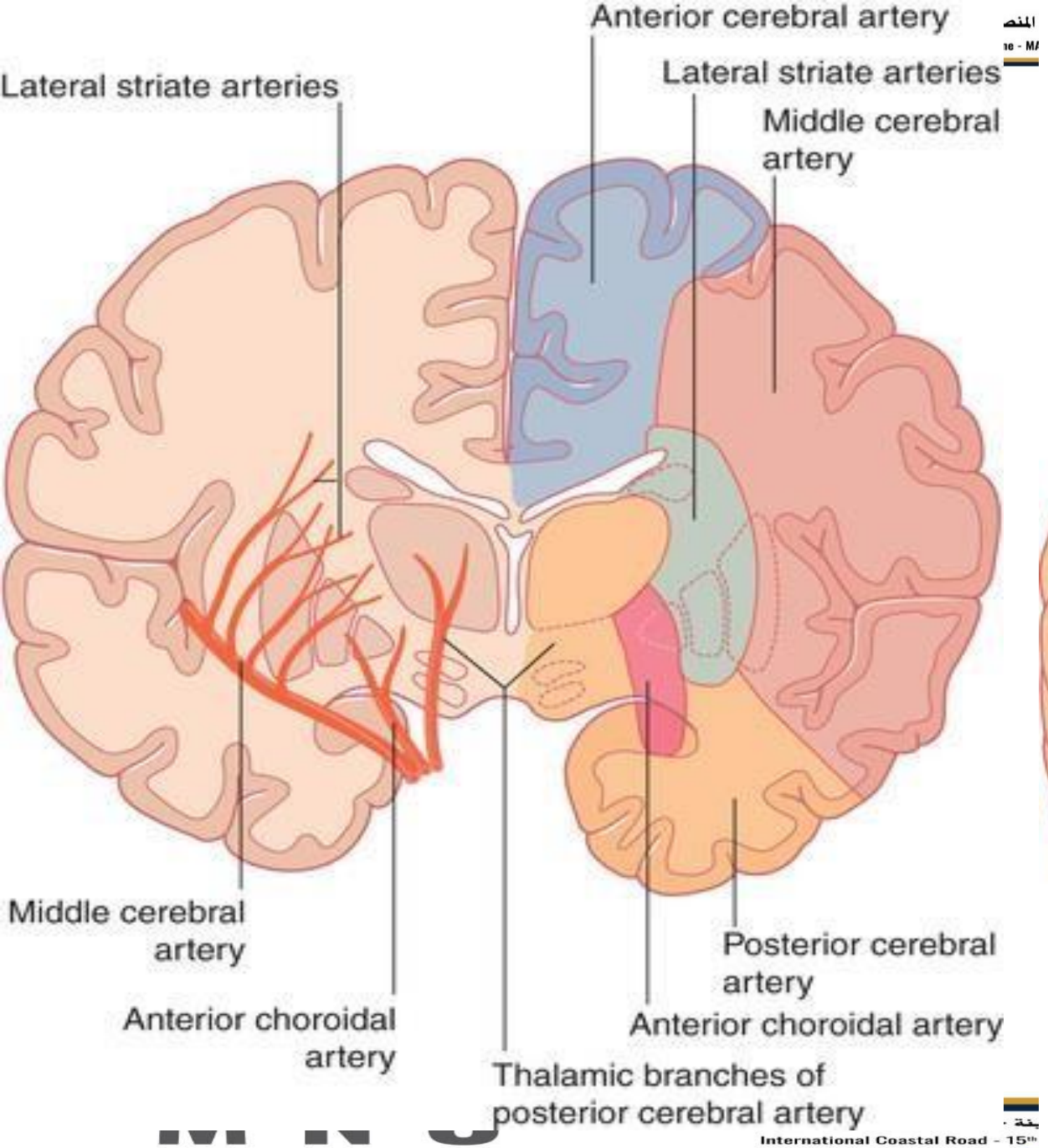
4. Splenial artery: it may be present and supplies the splenium of the corpus callosum.

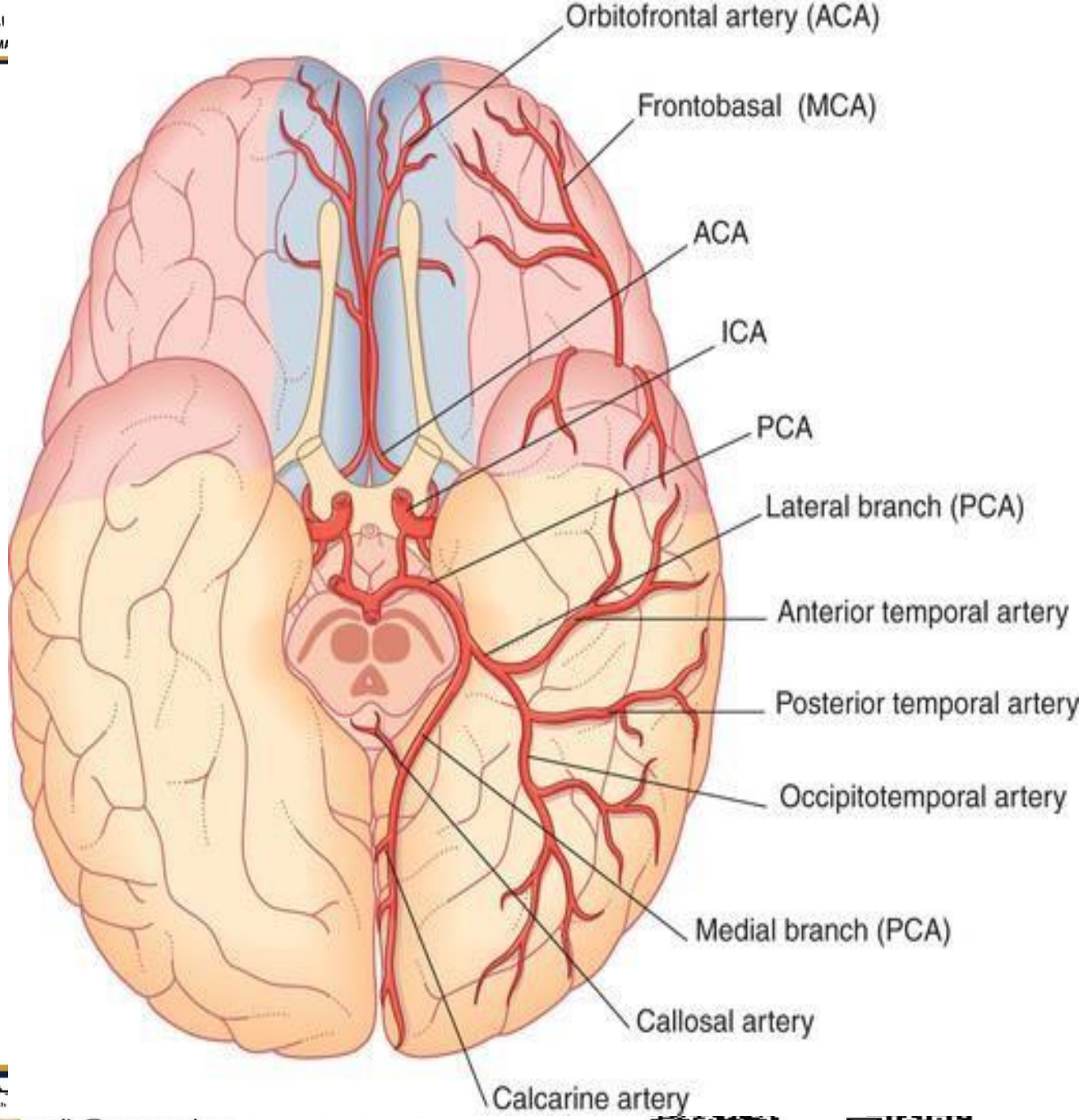
Clinical Note:

- **Occlusion of the posterior cerebral artery causes contralateral homonymous hemianopia with macular sparing.**

MCQ : Which artery supplies the choroid plexus of the third and lateral ventricles?
A) Posterior choroidal artery







Middle cerebral artery (MCA)

- أشهر مكان بيحصل فيه embolism + cerebral haemorrhage
لو في جلطة أو حاجة يبقى غالبا سببها ال MCA

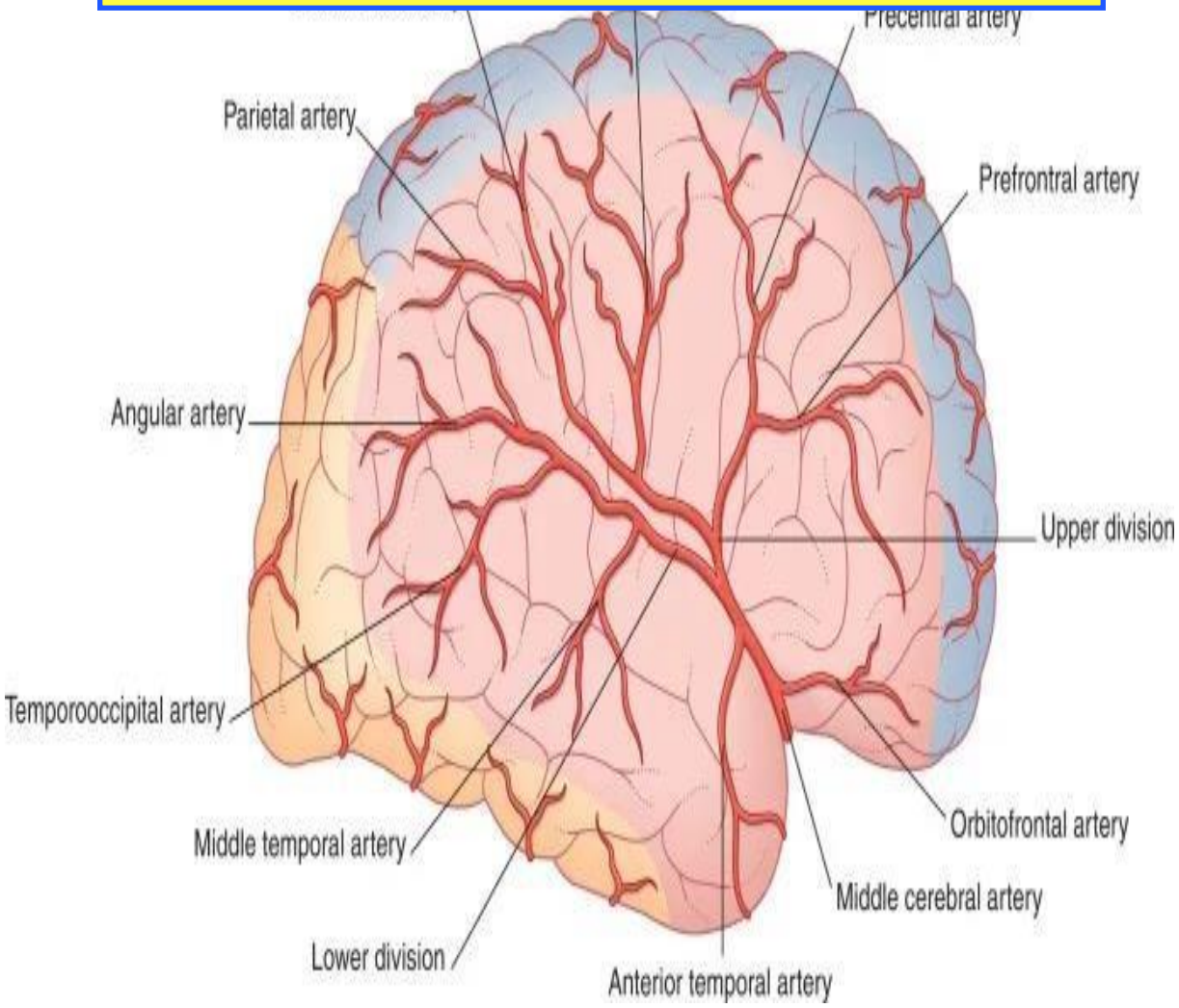
Origin: one of the two terminal branches of the internal carotid artery (it is the larger one). This is the largest and most direct of the branches of the internal carotid artery and is therefore the most prone to embolism.

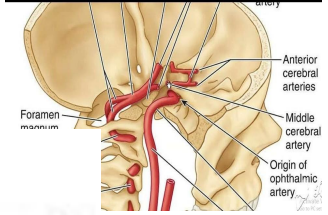
Course:

 Passes in the lateral sulcus Ends on the surface of the insula by dividing into terminal branches.

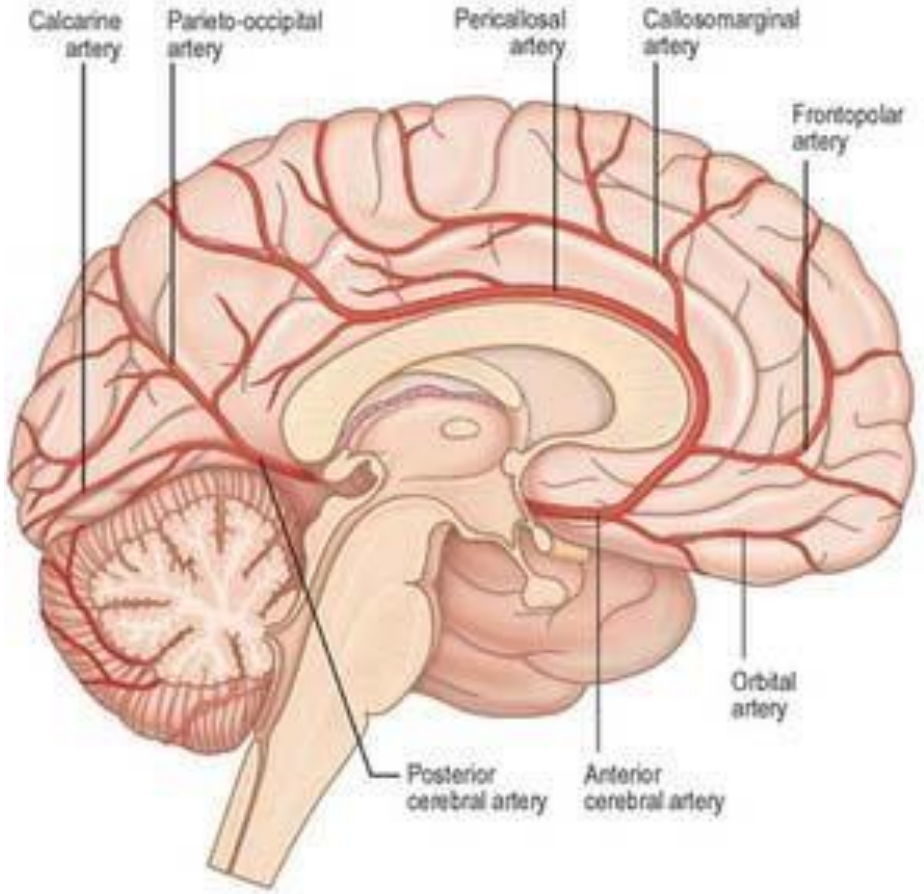
Branches:

1. **Cortical branches: supply:**
   - Lateral half of the orbital surface.
   - All aspects of the temporal pole.
   - Lateral surface of the hemisphere except:
     a. Upper one inch (by anterior cerebral).
     b. Lower one inch (inferior temporal gyrus) (by the posterior cerebral).
     c. Occipital lobe (supplied by the posterior cerebral).

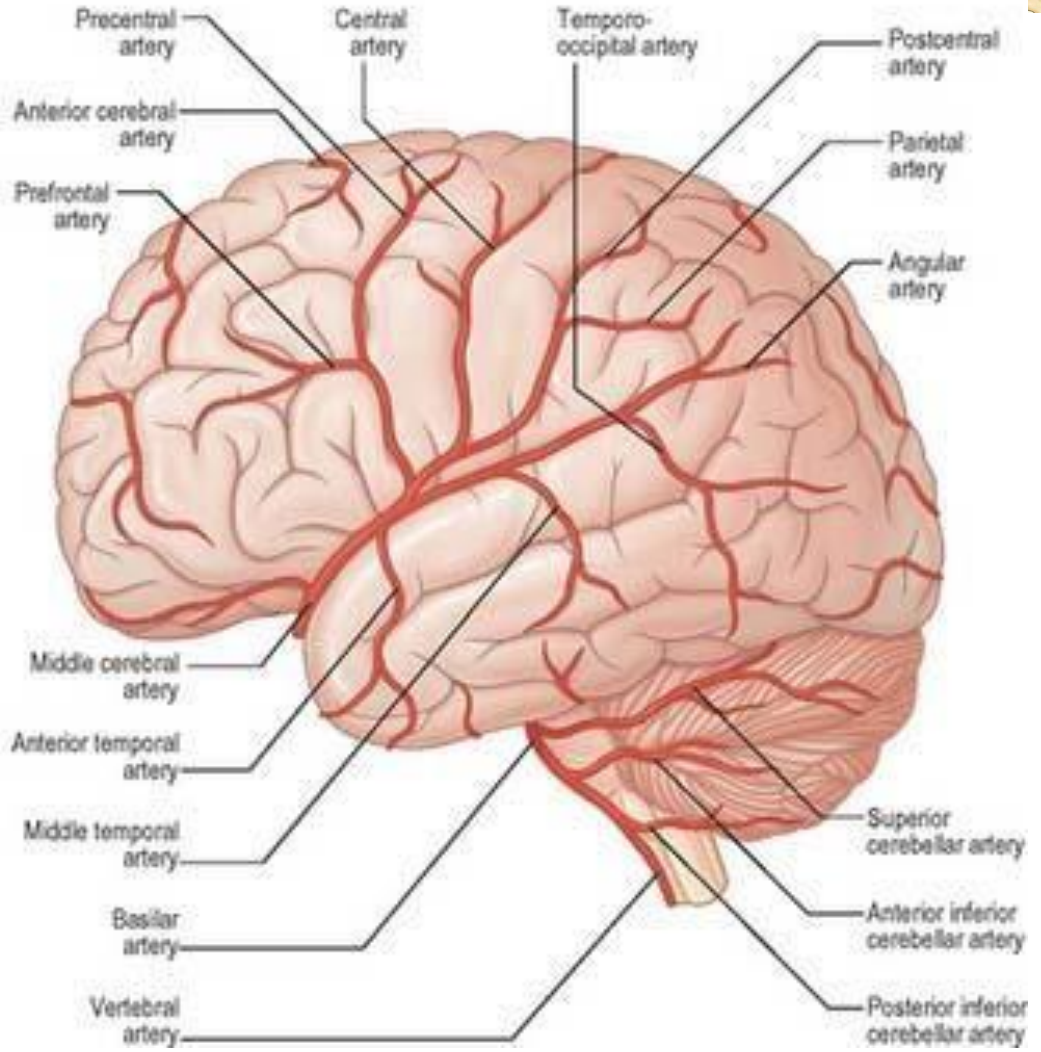



Anterior cerebral arteries
Middle cerebral artery
Origin of ophthalmic artery
Foramen magnum

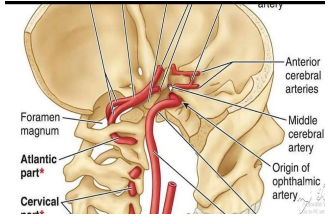
A


Calcarine artery
Parieto-occipital artery
Pericallosal artery
Callosomarginal artery
Frontopolar artery
Orbital artery
Posterior cerebral artery
Anterior cerebral artery

B


Precentral artery
Central artery
Temporo-occipital artery
Postcentral artery
Anterior cerebral artery
Parietal artery
Prefrontal artery
Angular artery
Middle cerebral artery
Anterior temporal artery
Middle temporal artery
Superior cerebellar artery
Basilar artery
Anterior inferior cerebellar artery
Vertebral artery
Posterior inferior cerebellar artery

Middle cerebral artery (MCA)



Central branches (lateral striate arteries):

One of these arteries is large, liable to rupture and called artery of cerebral hemorrhage

The central branches pierce the anterior perforated substance and supply the:

a. Anterior and posterior limbs of the internal capsule.

b. Posterior part of the corpus striatum except the tail of the caudate nucleus.

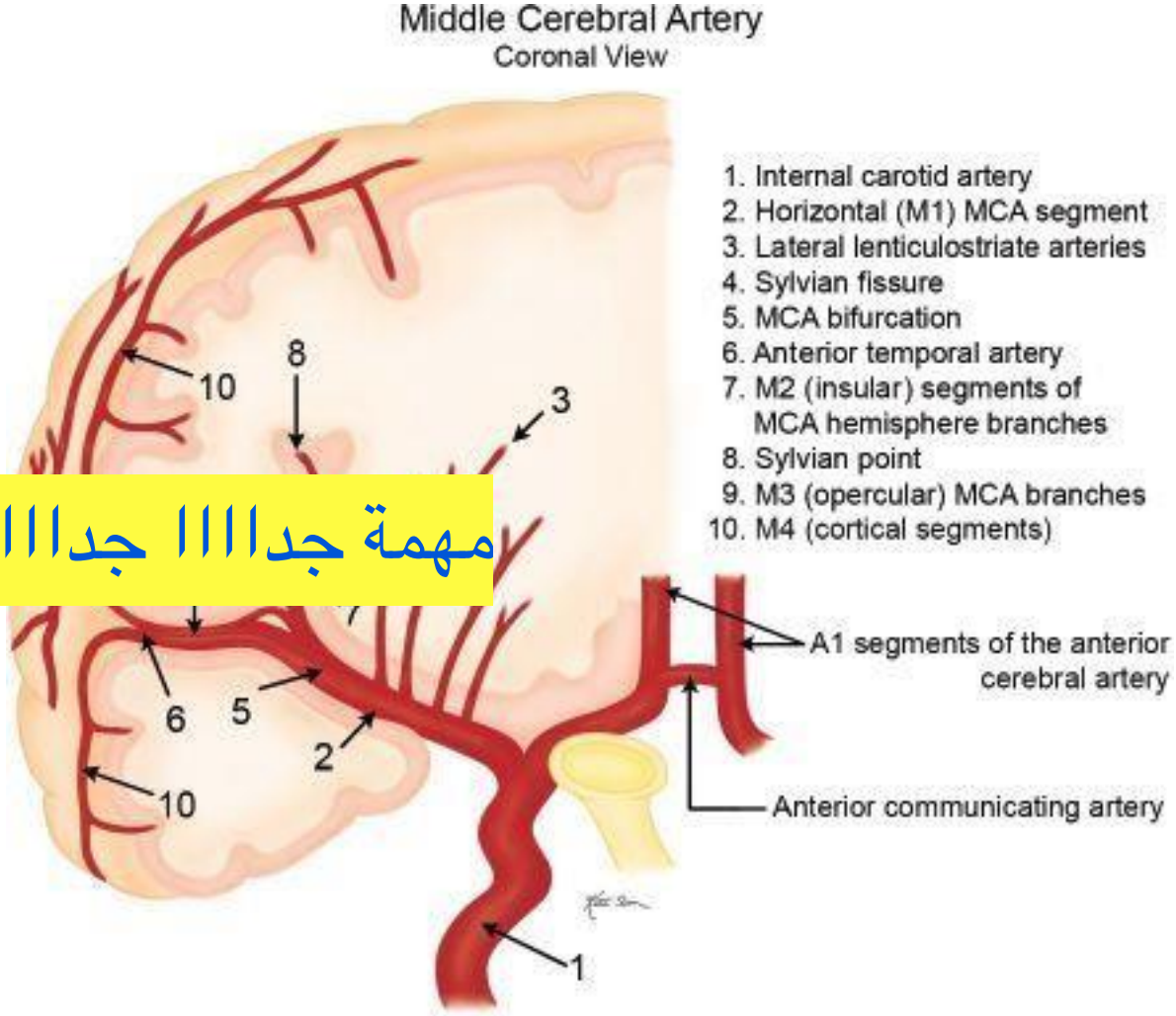
Important Cortical Areas Supplied by the MCA:

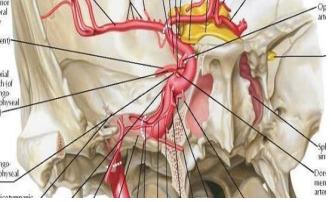
1. Motor, premotor and general sensory areas except the leg area (upper inch).

2. Auditory and auditory association areas.

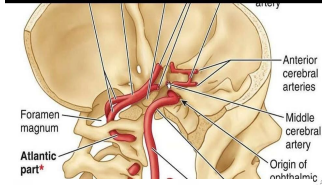
3. Motor speech area (Broca s area) and sensory speech areas.

! مهمة جداااا جداااا





Middle cerebral artery (MCA)



Clinical Note:

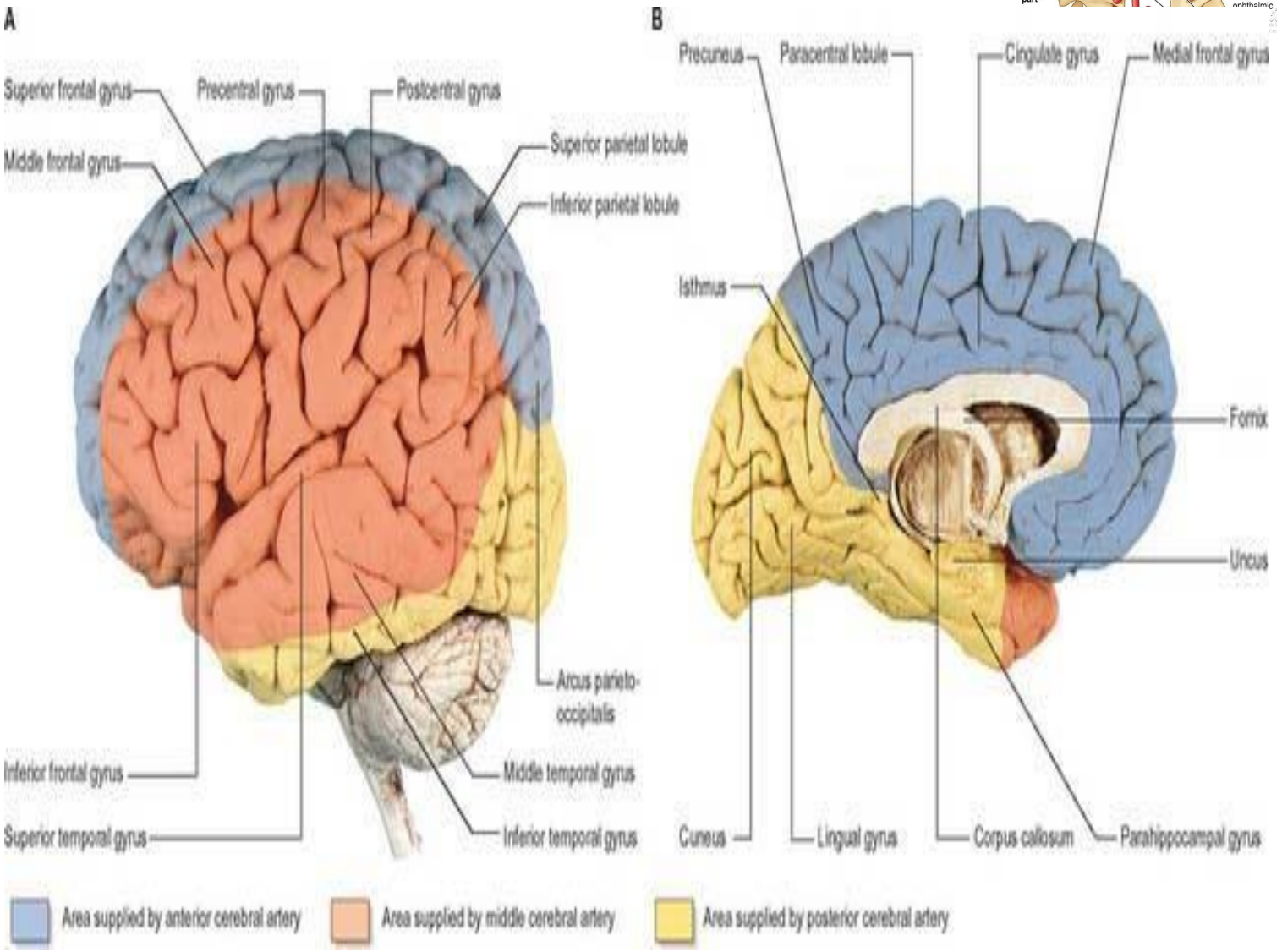
occlusion of the middle cerebral artery causes:

1. Contralateral hemiplegia, most marked in the upper limb and face.

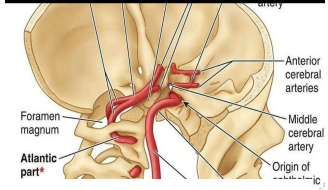
2. Contralateral sensory loss of proprioception and discriminative touch.

3. Bilateral diminution of hearing but mainly on the opposite side.

4. Aphasia (paralysis of the speech) if the dominant hemisphere is affected.



Arterial supply of the cerebral cortex



Lateral surface:

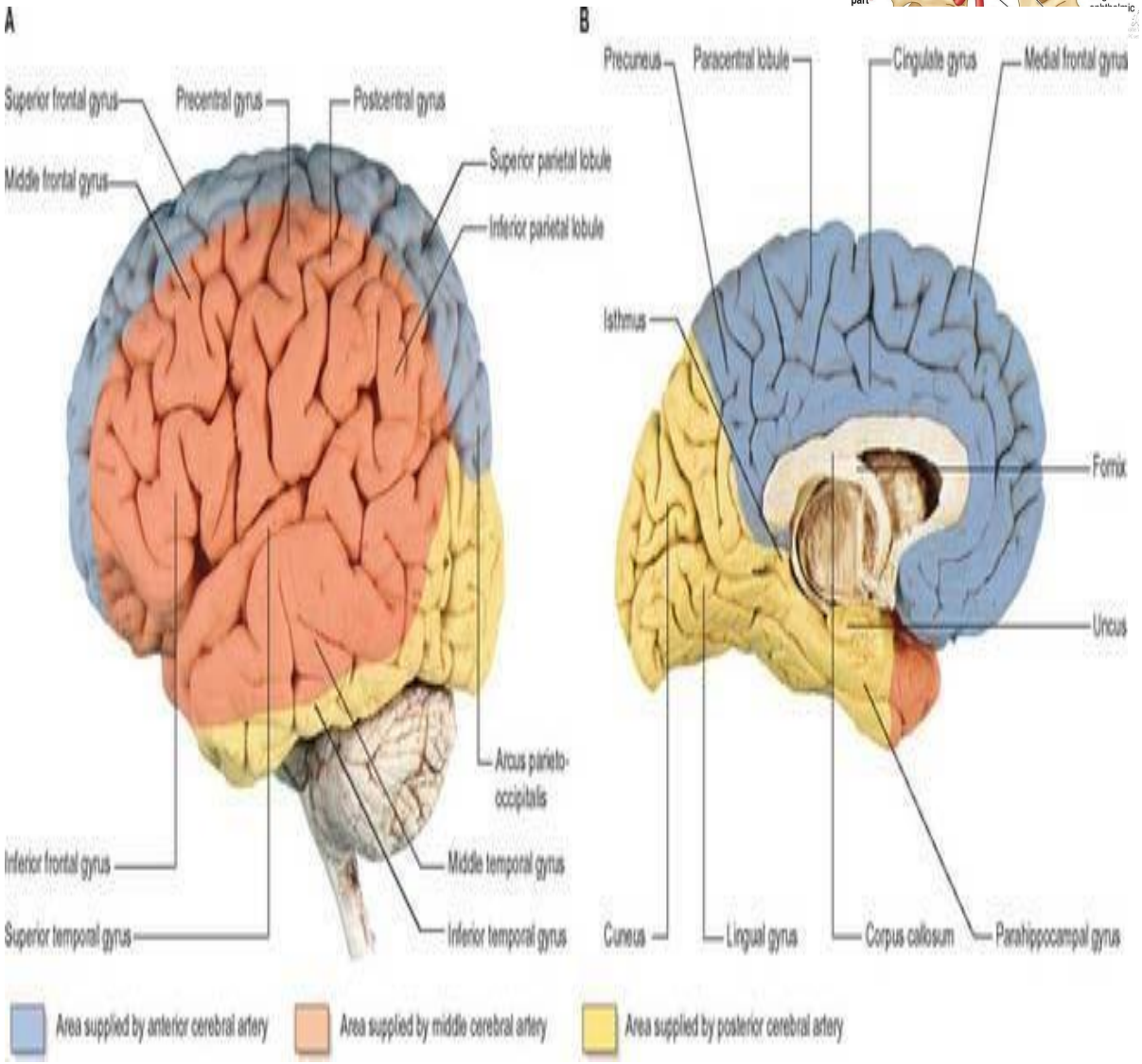
1. Upper inch of the frontal and parietal lobes: by the anterior cerebral artery.
2. Occipital lobe and lower inch (inferior temporal gyrus): by the posterior cerebral artery.
3. The rest of the lateral surface: by the middle cerebral artery.

Medial surface:

1. Frontal and parietal lobes: by the anterior cerebral artery.
2. Occipital and temporal lobes except the temporal pole: by the posterior cerebral artery.
3. Temporal pole: by the middle cerebral artery.

Inferior surface:

1. Medial half of the orbital surface: by the anterior cerebral artery.
2. Lateral half of the orbital surface and the temporal pole: by the middle cerebral artery.
3. Tentorial surface except the temporal pole: by the posterior cerebral artery.



Arterial supply of the internal capsule

Anterior Limb:

- Dorsal 1/2: middle cerebral artery.
- Ventral 1/2: anterior cerebral artery.

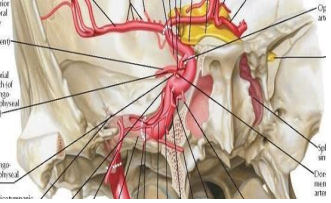
Genu:

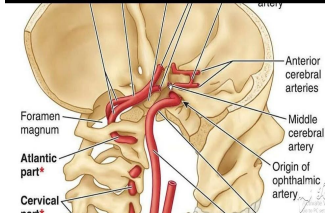
- Anterior part: anterior cerebral artery.
- Posterior part: post communicating artery.

Posterior Limb:

- Dorsal half: middle cerebral artery.
- Ventral half:

1. Anterior 1/3: posterior communicating artery.
2. Posterior 2/3: Anterior choroidal artery.





Venous drainage of the brain

The brain is drained by two venous systems:

1. Superficial cerebral veins.

2. Deep cerebral veins.

Superficial cerebral veins

They drain the superficial structures into the dural venous sinuses.

They are divided into superior, middle and inferior cerebral veins.

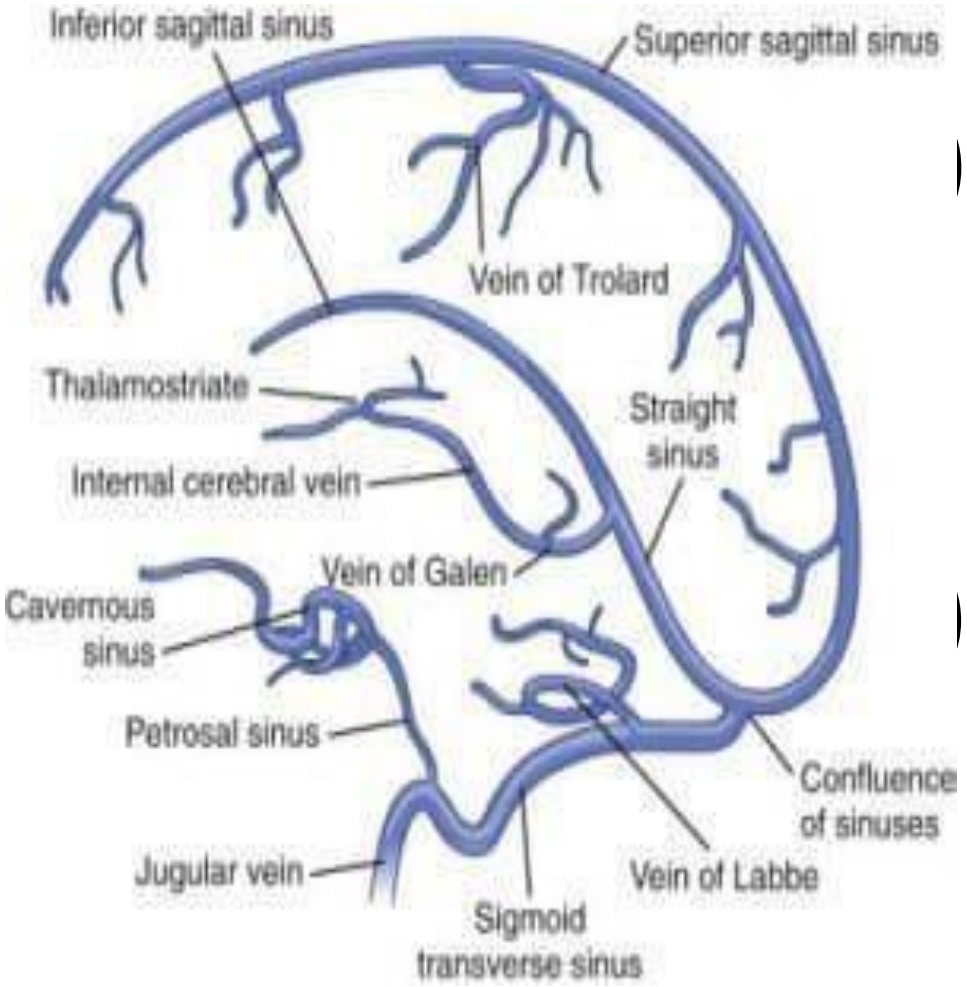
1. Superior cerebral veins (8-12): they drain into the superior sagittal sinus.

2. Middle cerebral veins: are divided into:

a. Superficial middle cerebral vein: in the lateral sulcus. Drains into cavernous sinus.

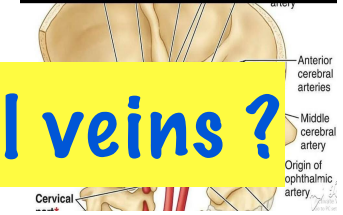
b. Deep middle cerebral vein: in the bottom of the lateral sulcus and drains the insula. It unites with the anterior cerebral vein to form the basal vein.

3. Inferior cerebral veins: they drain into the cavernous and transverse sinuses.



Deep cerebral veins:

SAQ : Describe the deep cerebral veins ?



They drain the deep subcortical structures and form three large veins:

1. Two internal cerebral veins:

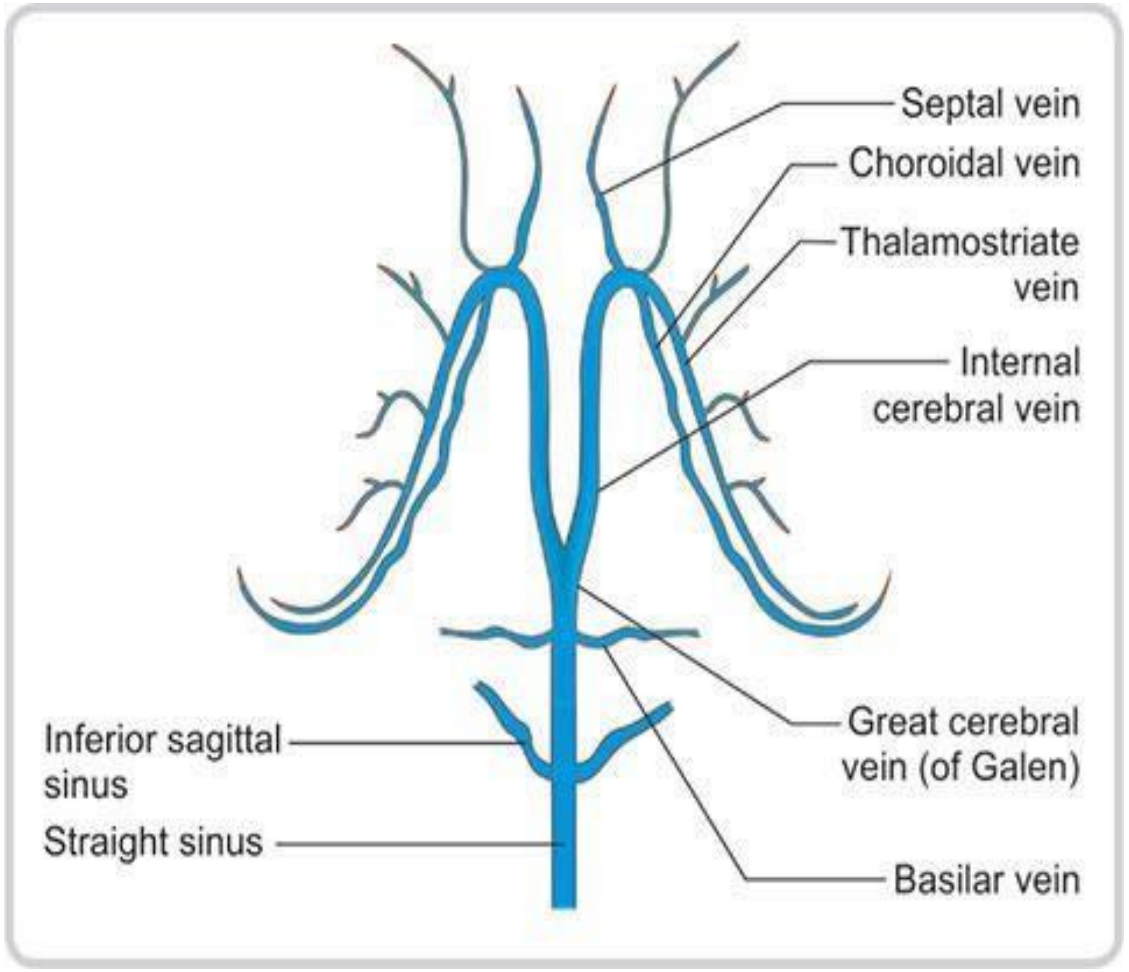
- Each is formed at the interventricular foramen of Monro by the union of the thalamostriate vein and the choroidal vein.
- The two internal cerebral veins unite below the splenium of the corpus callosum to form the great cerebral vein.

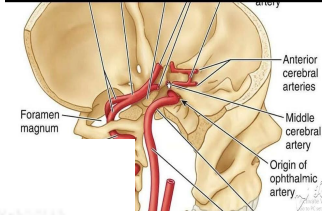
2. Great cerebral vein:

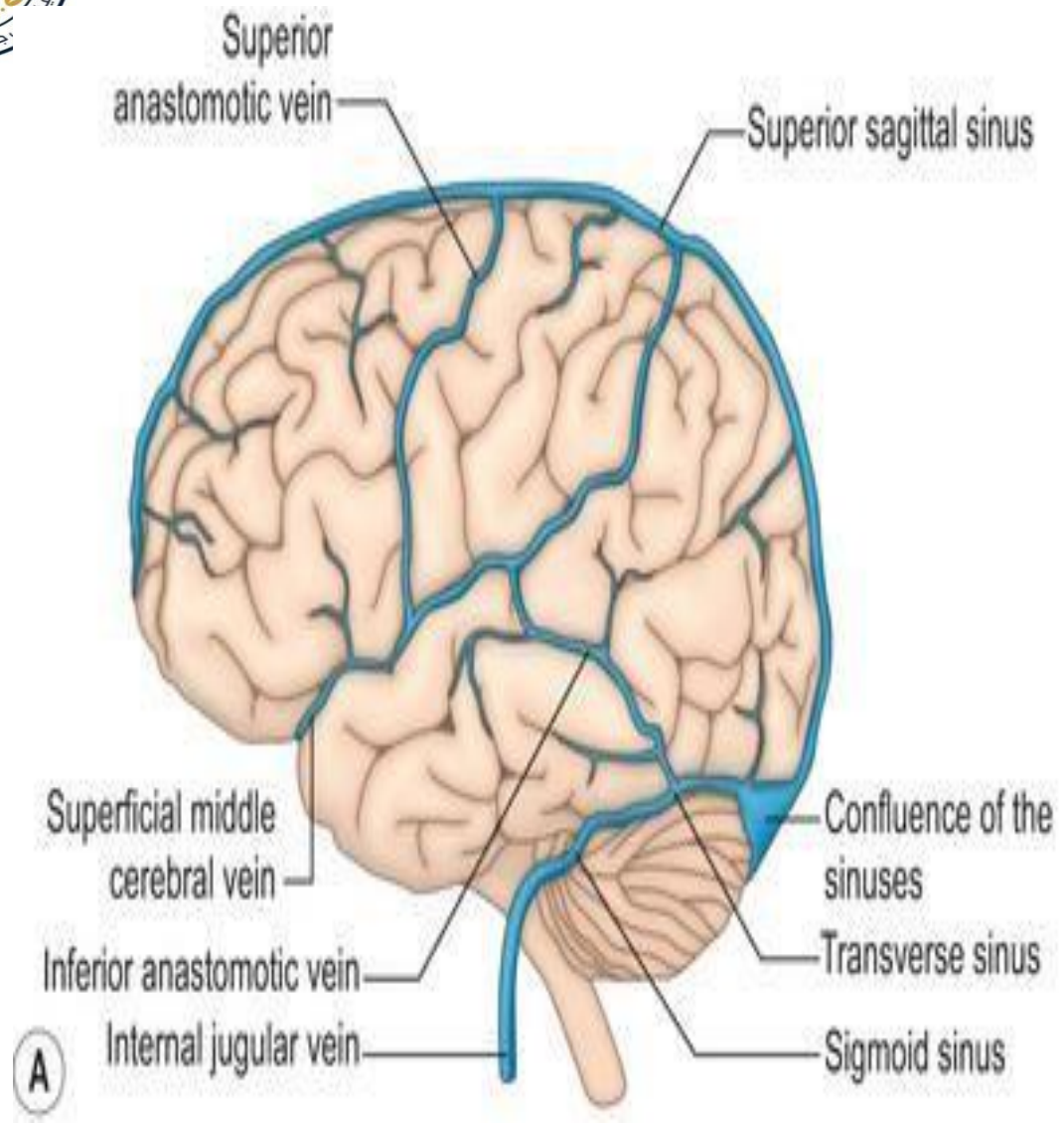
- Formed by the union of the two internal cerebral veins.
- It unites with the inferior sagittal sinus to form the straight sinus.

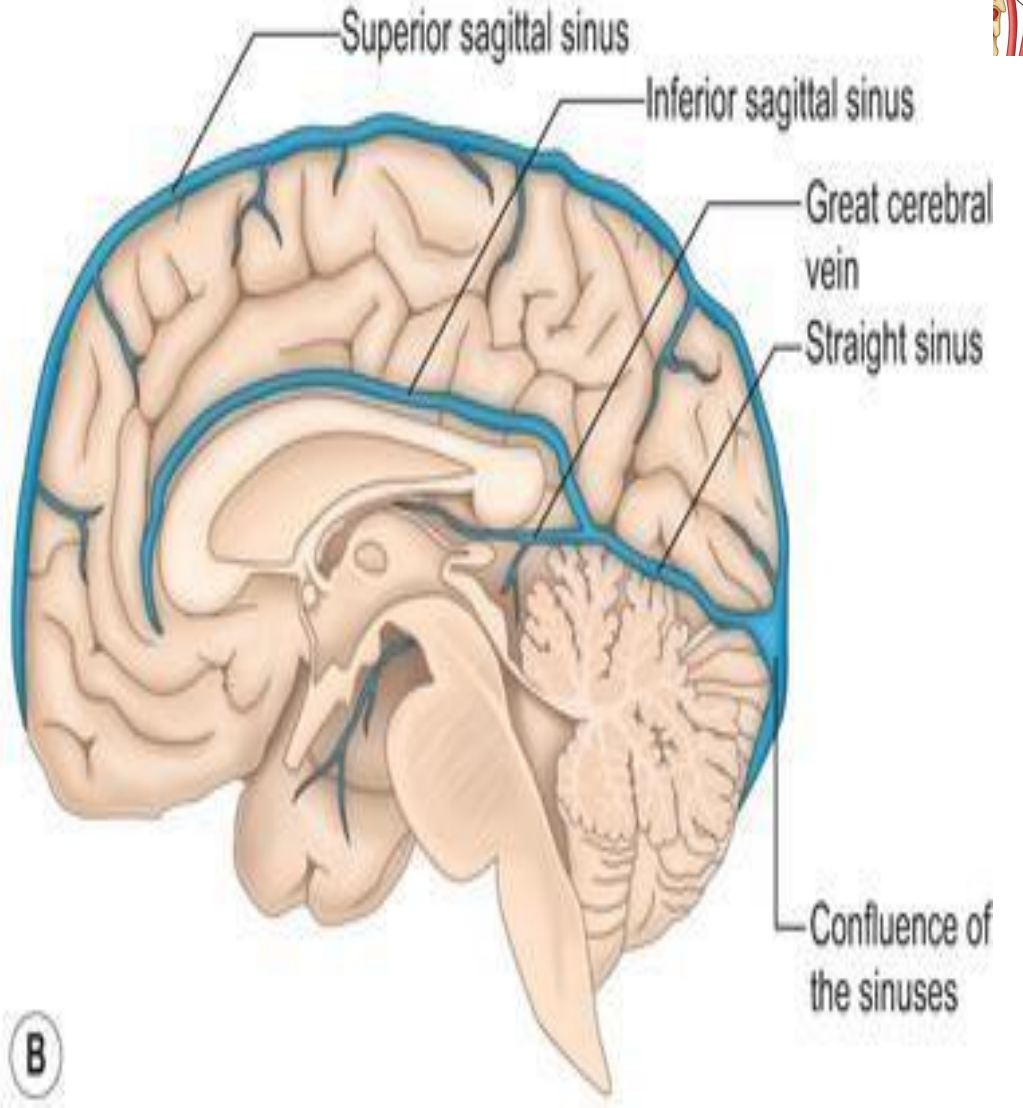
3. Two basal veins:

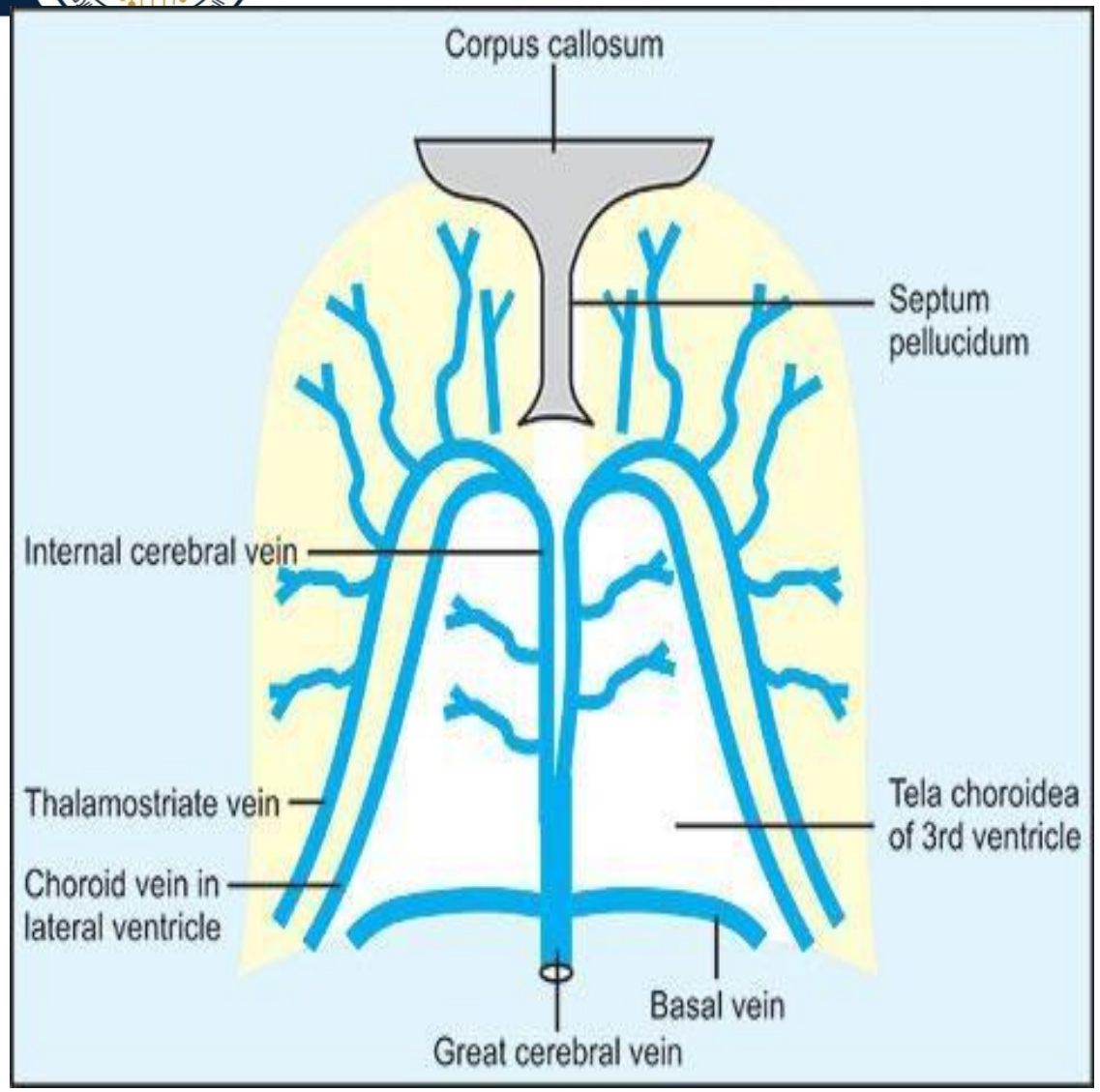
- Formed by the union of the deep middle cerebral vein and anterior cerebral vein at the anterior perforated substance.
- It ends in the great cerebral vein

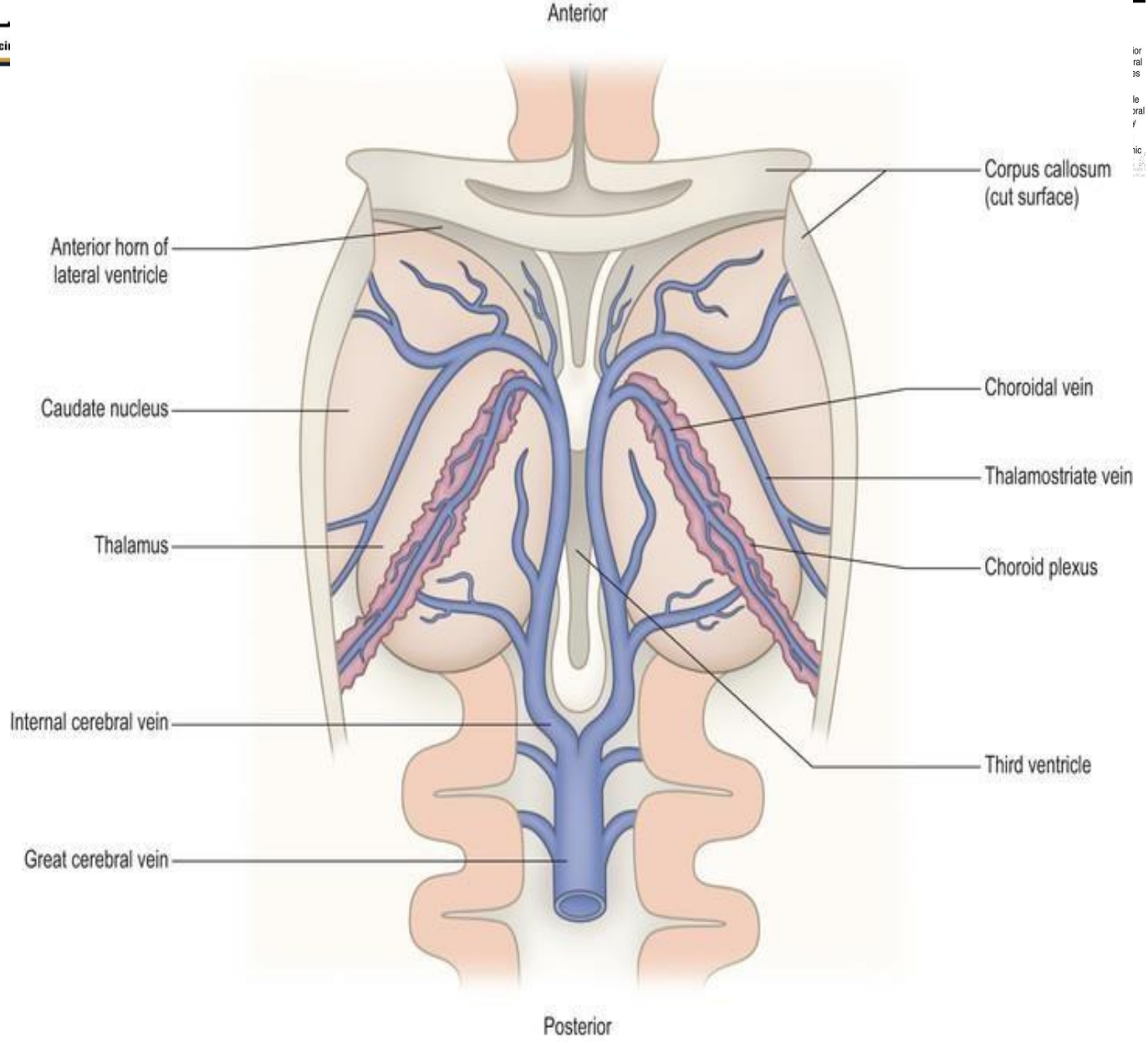



Anterior cerebral arteries
Middle cerebral artery
Origin of ophthalmic artery
Foramen magnum


Superior anastomotic vein
Superior sagittal sinus
Superficial middle cerebral vein
Inferior anastomotic vein
Internal jugular vein
Confluence of the sinuses
Transverse sinus
Sigmoid sinus
A


Superior sagittal sinus
Inferior sagittal sinus
Great cerebral vein
Straight sinus
Confluence of the sinuses
B


Corpus callosum
Septum pellucidum
Internal cerebral vein
Thalamostriate vein
Choroid vein in lateral ventricle
Tela choroidea of 3rd ventricle
Basal vein
Great cerebral vein


Anterior
Corpus callosum (cut surface)
Anterior horn of lateral ventricle
Choroidal vein
Caudate nucleus
Thalamostriate vein
Thalamus
Choroid plexus
Internal cerebral vein
Third ventricle
Great cerebral vein
Posterior

Vertebral artery

Origin: it is a branch of the first part of the subclavian artery.

Course: 4 parts

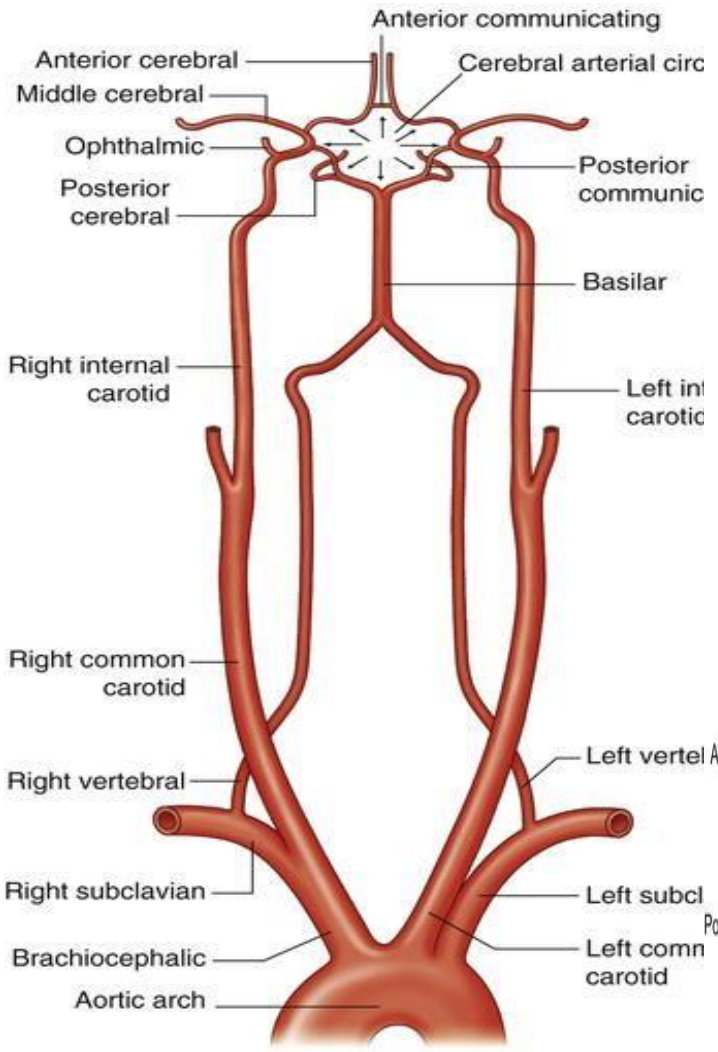
A. First part: from the origin to foramen transversarium of c6.

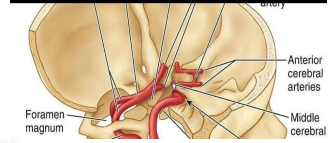
B. Second part: ascends through foramina transversaria of the upper six cervical vertebrae.

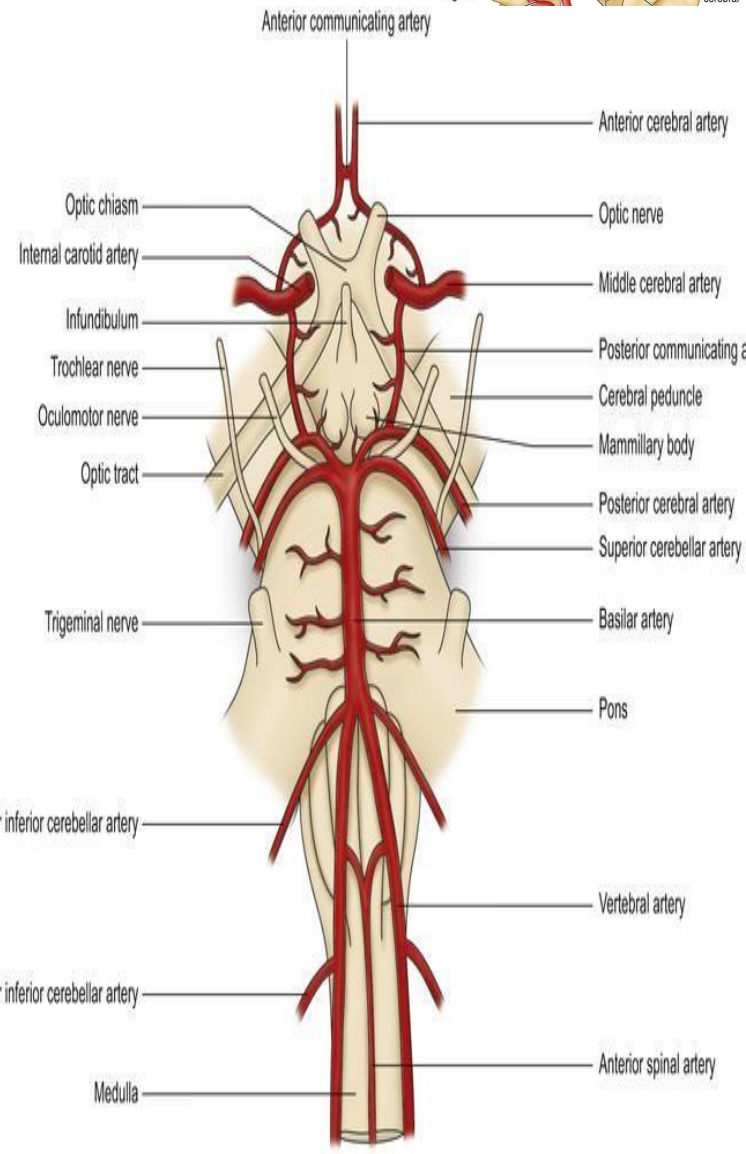
C. Third part: on the posterior arch of atlas.

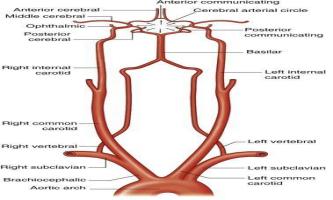
D. Forth part enters the cranial cavity through foramen magnum. Ascends upward on the medulla to reach the lower border of the pons.

Termination: at the lower border of the pons where the 2 vertebral arteries unite to form the basilar artery.



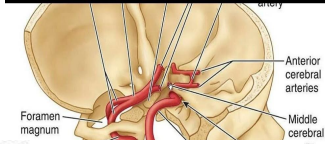






أهم حاجة نركز عليها من فروعه هي :
- Anterior spinal artery
- Occlusion of Anterior spinal artery lead to .....

Vertebral artery



Branches in the cranial cavity:

1. Anterior spinal artery: It unites with the opposite one to form a single anterior spinal artery. It supplies:

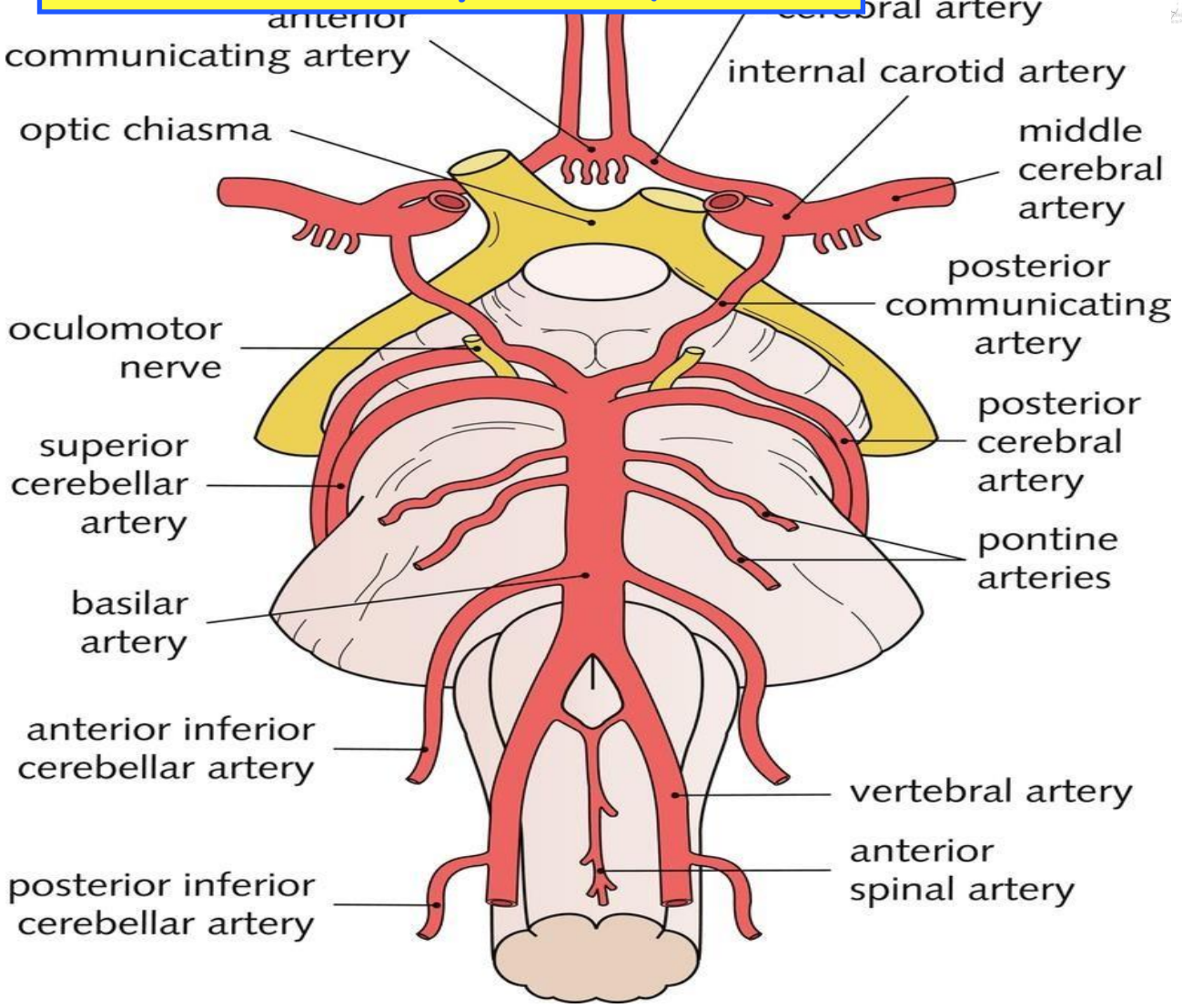
- o Anterior two-thirds of the spinal cord.
- o Medial zone of the medulla.

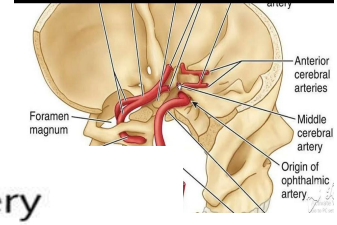
 Occlusion of the anterior spinal artery causes **medial medullary syndrome**.

2. Posterior spinal artery: Usually arises from the PICA. It supplies:

- Posterior third of the spinal cord.
- Gracile and cuneate tracts and nuclei.

3. Medullary branches: supply the middle zone of the medulla including the olive.





4. Posterior inferior cerebellar artery (PICA): it supplies:

a. Porsolateral zone of the medulla.

b. Inferior cerebellar peduncle.

c. Posterior part of the inferior surface of the cerebellum.

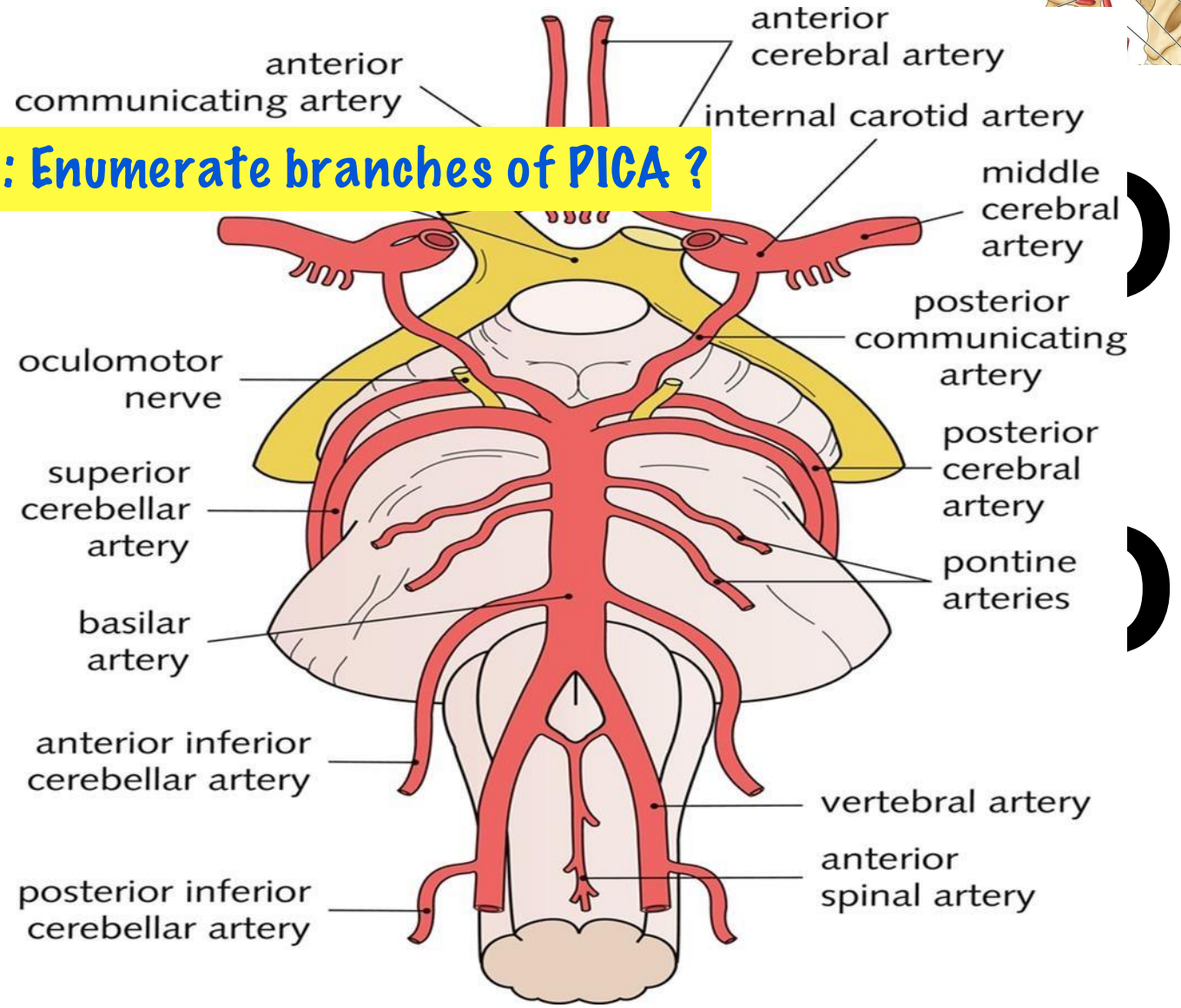
d. Choroid plexus of the 4th ventricle.

⍰ It usually gives the posterior spinal artery.

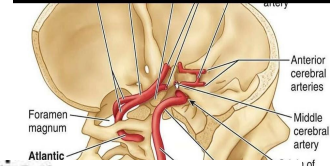
⍰ Occlusion of the pica causes lateral medullary syndrome.

5. Posterior meningeal artery: supplies the meninges of the posterior cranial fossa.

SAQ : Enumerate branches of PICA ?



Basilar artery



Origin: at the lower border of the pons by the union of the two vertebral arteries.

Course: ascends in the basilar groove of the pons.

Termination: at the upper border of the pons by dividing into 2 posterior cerebral arteries.

Branches: 1. **Pontine branches**: 3 groups

- **Paramedian branches**: to the medial zone of basis pontis.
- **Short circumferential branches:** to the lateral zone of basis pontis.

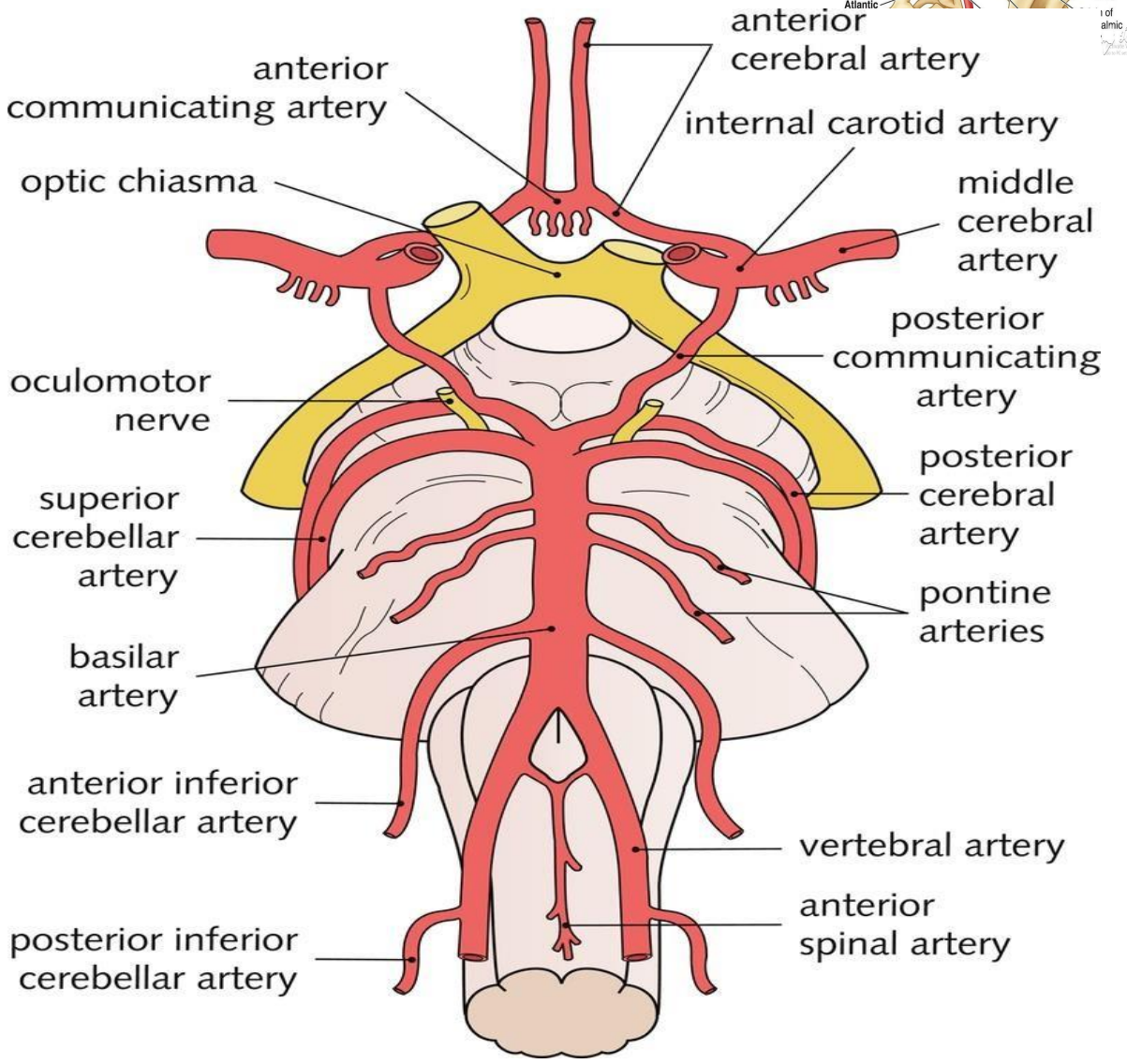
Long circumferential branches: to the pontine tegmentum.

2. **Anterior inferior cerebellar artery (AICA)**: supplies:

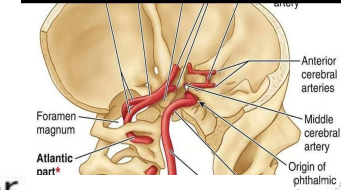
- Anterior part of the inferior surface of the cerebellum.
- Middle cerebellar peduncle.
- It gives the **labyrinthine artery in 85%**.

3. **Labyrinthine (internal auditory) artery (in 15%):**

- It accompanies the vestibulocochlear nerve and the facial nerve in the internal acoustic meatus
- **It supplies the internal ear.**



Basilar artery



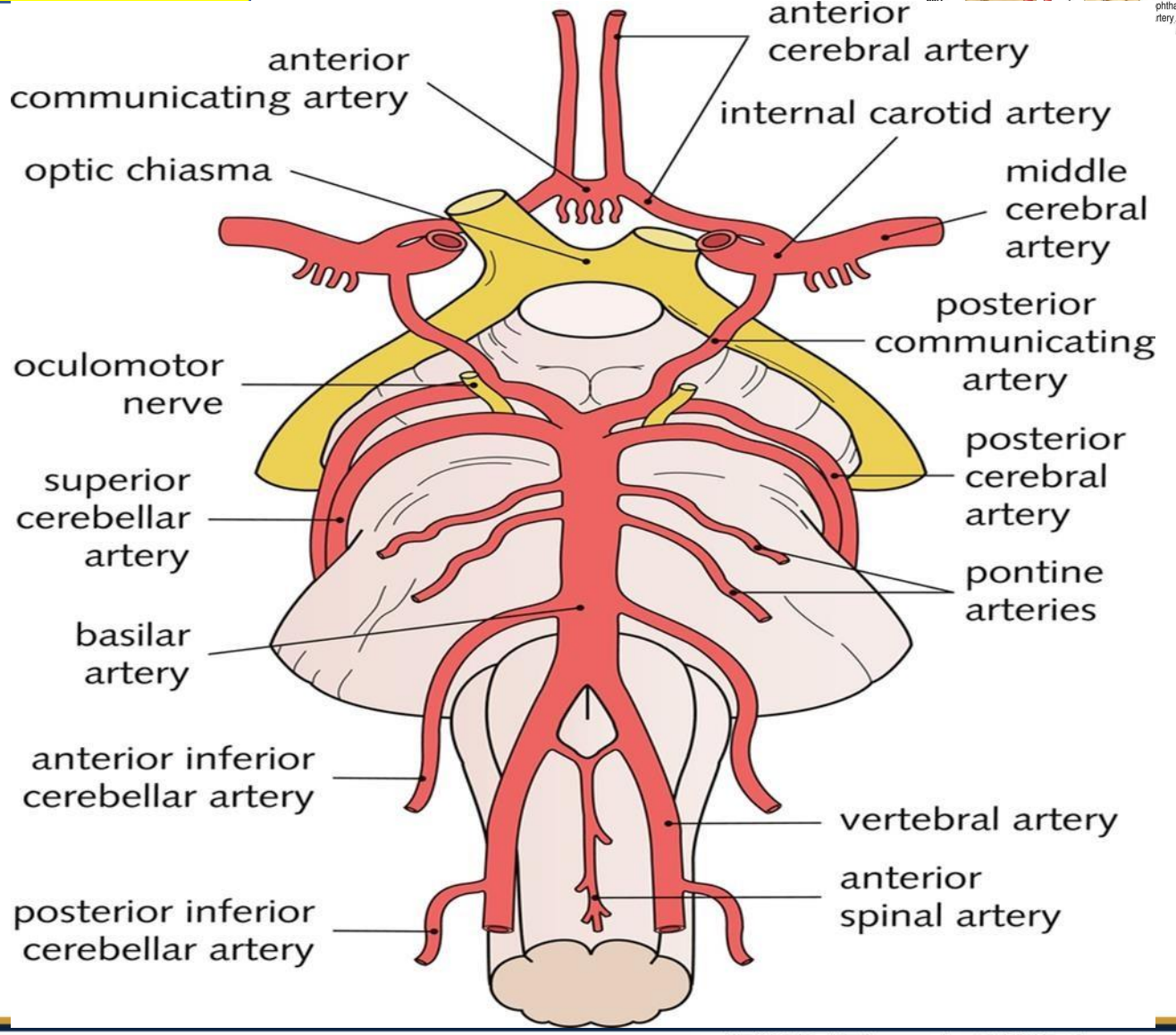
4. Superior cerebellar artery (SCA):

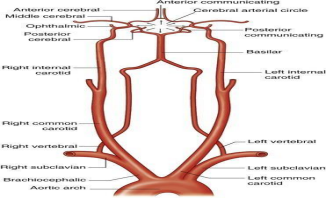
It winds around the midbrain and supplies:

- **Superior surface of the cerebellum.**
- **Superior cerebellar peduncle and the superior medullary velum.**
- **Inferior colliculus of the midbrain.**

5. Two terminal branches (posterior cerebral arteries):

- **They wind around the midbrain.**
- **It is connected with the internal carotid artery by the posterior communicating artery.**
- **It supplies the midbrain, thalamus, hypothalamus and occipital lobe.**
- **It is separated from the superior cerebellar artery by the oculomotor & trochlear nerves.**





Blood supply of the brain
Arterial supply

Circulus arteriosus (circle of Willis)

Location: in the interpeduncular fossa at the base of the brain.

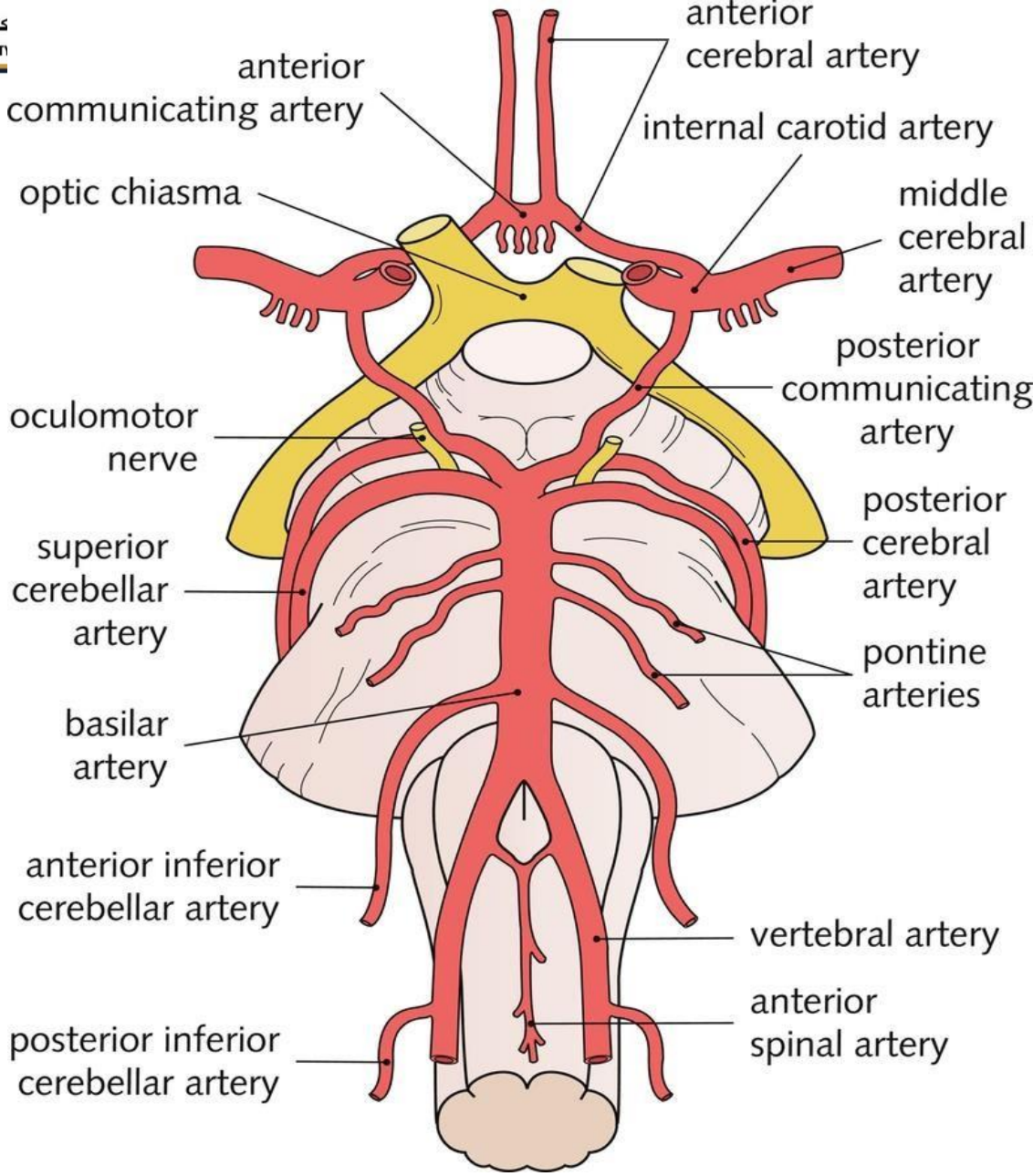
Formation: it is formed by the following arteries:

A. Anteriorly: anterior communicating artery connecting the two anterior cerebral arteries.

B. Posteriorly: two posterior cerebral arteries.

C. On each side: from before backward:

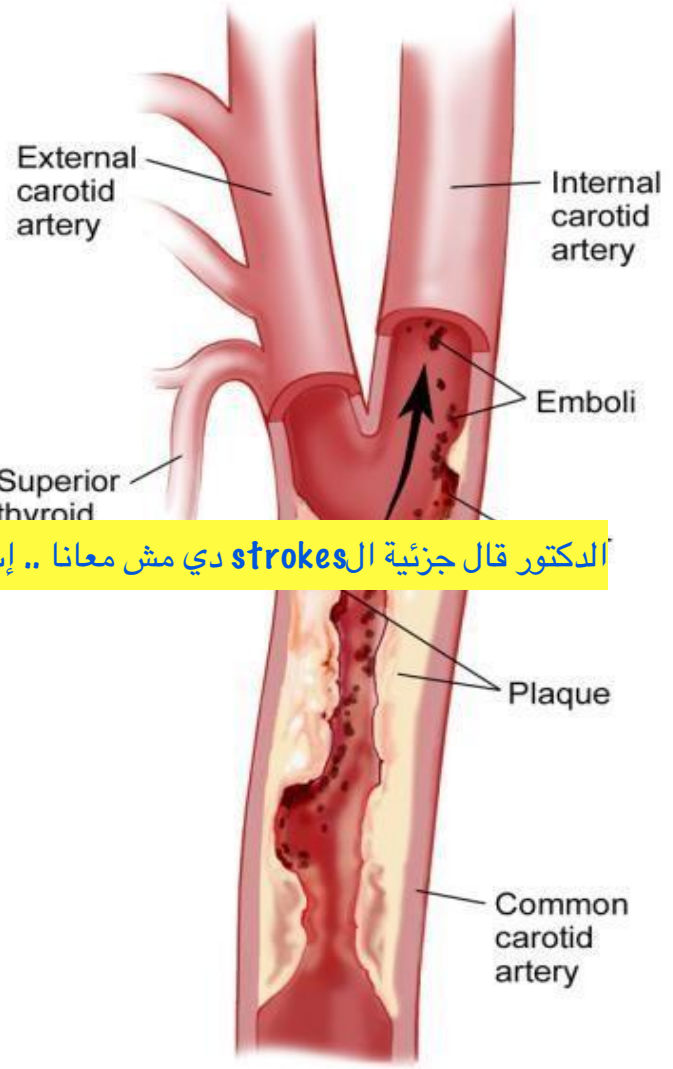
- Anterior cerebral artery: the smaller terminal branch of the internal carotid artery.
- Internal carotid artery.
- Posterior communicating artery connecting the internal carotid artery with the posterior cerebral artery.



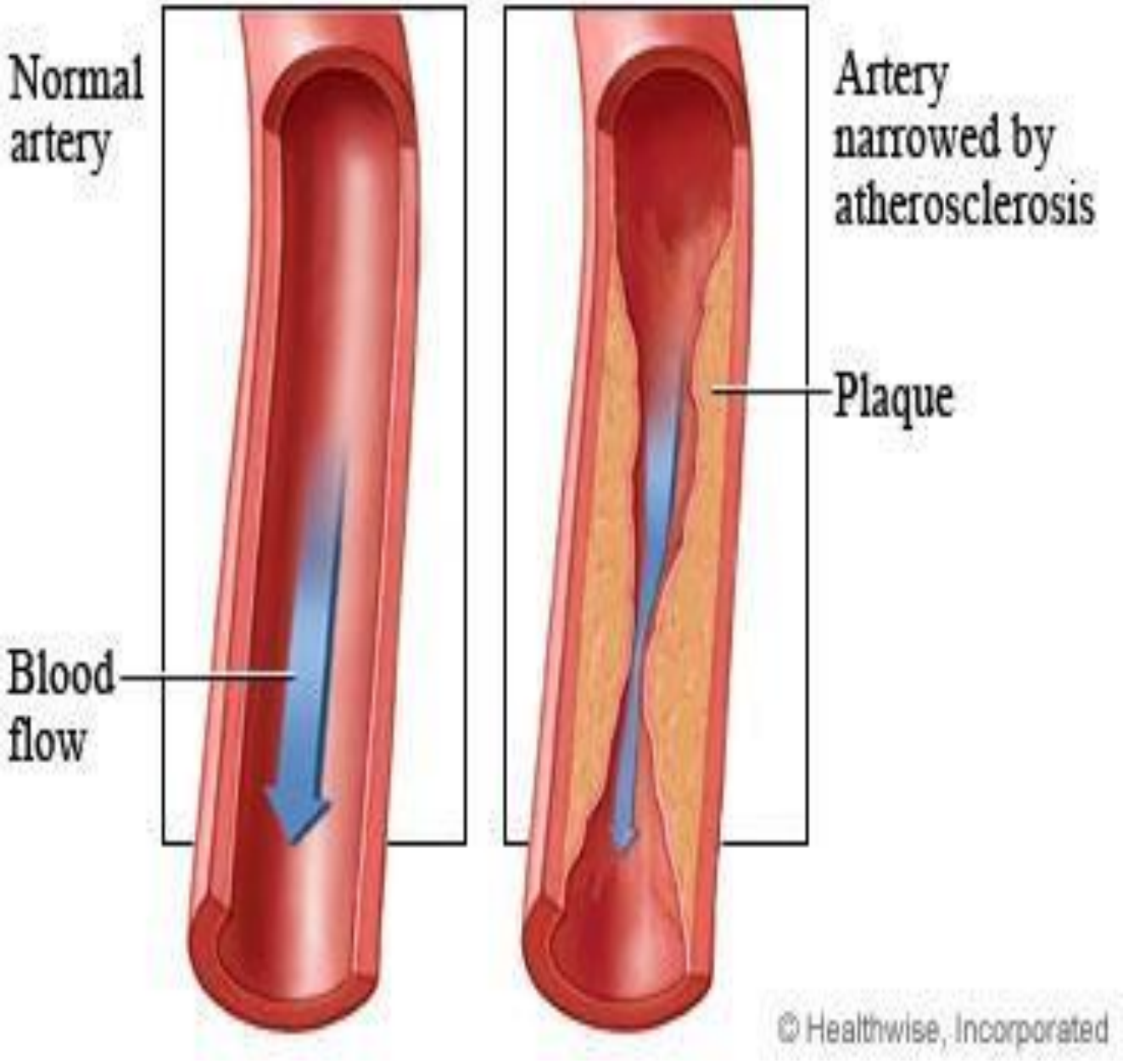
Disorders of the blood supply of the brain

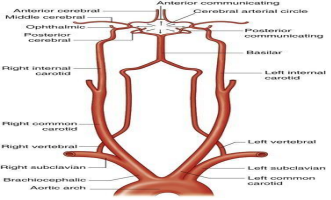
One of the most common causes of neurological disability is stroke, resulting from blockage or rupture of vessels in the cerebral circulation.
The sudden occlusion of a cerebral artery leads to death of brain tissue (infarction).
Rupture of a blood vessel causes bleeding into the brain (cerebral hemorrhage). These events lead to the rapid development of a focal neurological syndrome.
Strokes related to the carotid artery and its cerebral branches are associated with focal epilepsy, a contralateral sensory/motor deficit and a psychological deficit (e.g. aphasia).
Strokes involving the vertebrobasilar circulation lead to a focal brainstem syndrome.
An aneurysm is an abnormal, balloon-like swelling of an artery.
A surgical emergency arises when an aneurysm ruptures and blood projects around the brain in the subarachnoid space (subarachnoid haemorrhage) and into the brain (intracerebral haemorrhage).
A sudden severe headache and neck stiffness are followed by coma and neurological deficits.
Neurosurgery or intra-arterial 'coiling' are required to seal the aneurysm to prevent further bleeding and allow recovery.

الدكتور قال جزئية الstrokes دي مش معانا .. إسكيب 😌

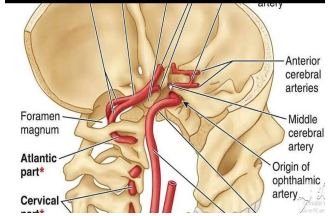



Angioplasty balloon
Carotid artery


Normal artery
Artery narrowed by atherosclerosis
Plaque
Blood flow
© Healthwise, Incorporated



ARTERIAL SUPPLY OF THE BRAIN



- The brain is supplied by paired internal carotid and vertebral arteries.
- The internal carotid artery terminates lateral to the optic chiasm, giving rise to the anterior and middle cerebral arteries.
- The anterior cerebral artery passes into the great longitudinal fissure and supplies the medial aspect of the cerebral hemisphere.
- The middle cerebral artery passes into the lateral fissure and supplies the lateral aspect of the cerebral hemisphere.
- The vertebral arteries ascend on the ventrolateral aspect of the medulla, uniting to form the midline basilar artery, which extends the length of the pons.

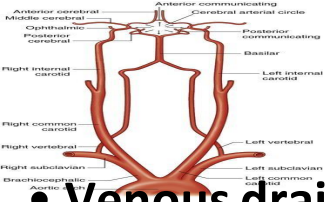
Along their course the vertebral and basilar arteries give rise to branches that supply the cerebellum and brainstem.

- The principal terminal branch of the basilar artery is the posterior cerebral artery, which supplies the occipital lobe of the cerebral hemisphere.
- The anterior communicating artery links together the two anterior cerebral arteries.

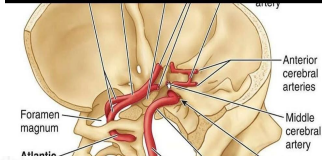
Posterior communicating arteries pass between the internal carotid artery and the posterior cerebral artery, on each side.

This anastomosis of vessels constitutes the circle of Willis.

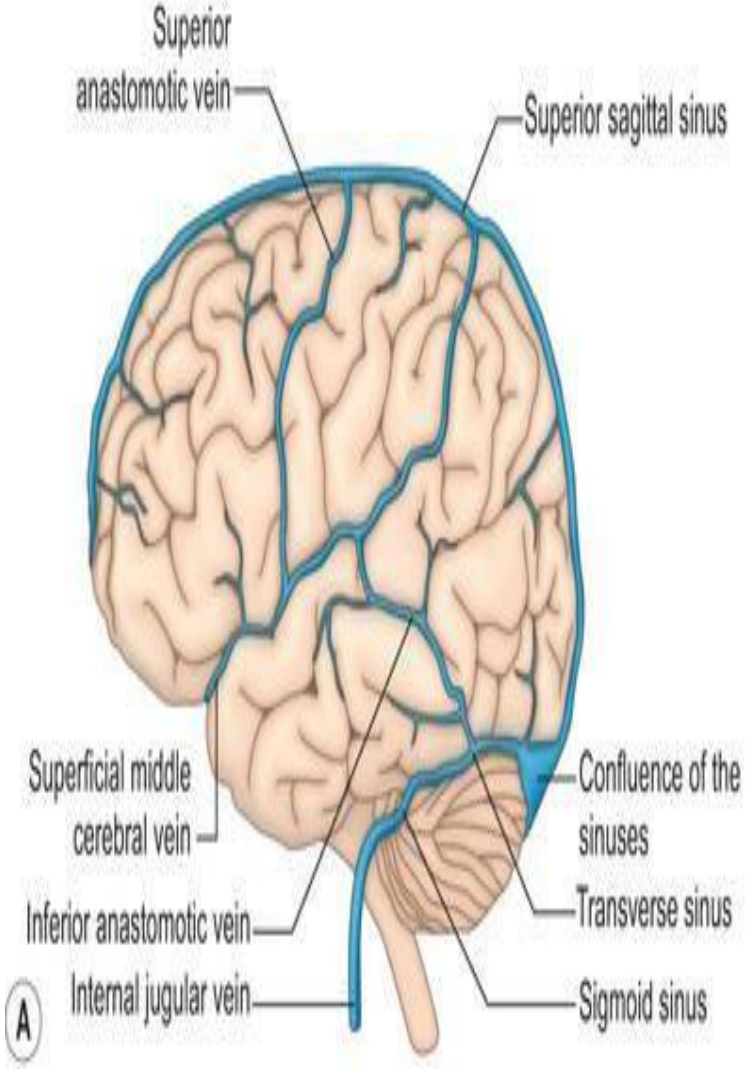
- Small perforating arteries arise from the circle of Willis to supply the hypothalamic area, the basal ganglia and the internal capsule.

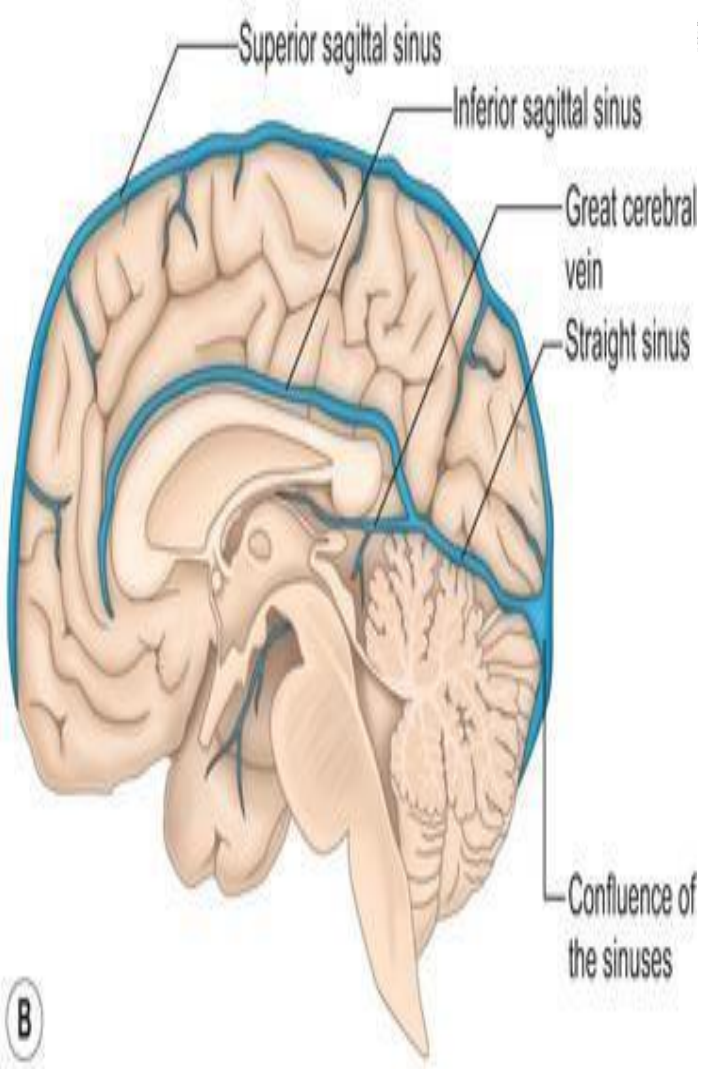


Venous Drainage f The Brain



- Venous drainage of the brain involves deep veins, superficial veins and dural venous sinuses.
- **Deep cerebral veins** drain into the great cerebral vein, which is continuous with the straight sinus.
- **Superficial veins** empty principally into the superior sagittal sinus and the cavernous sinus.
- **The superior sagittal sinus** and straight sinuses meet at the confluence of the sinuses.
- From the confluence of the sinuses, venous blood flows, via the transverse sinus and sigmoid sinus, into the internal jugular vein.





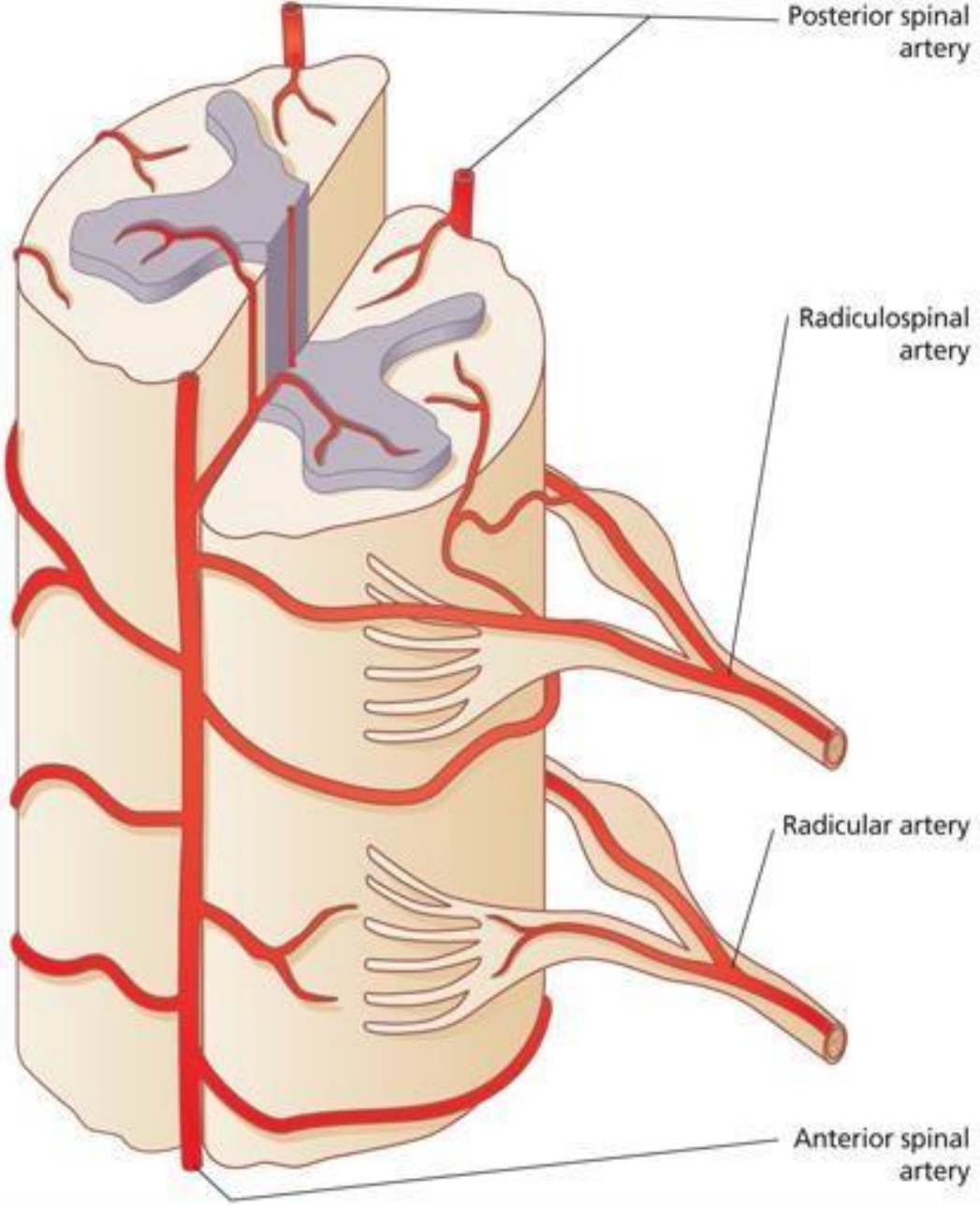
Arterial supply of the spinal cord

1. Anterior Spinal Artery: مهم

- Is a single artery formed by the union of the two anterior spinal branches of the vertebral arteries. It descends in the anterior median fissure of the spinal cord.
- It supplies the anterior 2/3 of the spinal cord.
- It becomes very small below the cervical region & reinforced by radicular arteries

2. Two Posterior Spinal Arteries:

- Each is a branch of the vertebral artery or usually from the PICA.
- They descend along the dorsal nerve roots (posterolateral fissure).
- They supply the posterior 1/3 of the spinal cord (dorsal funiculus and horn).



Arterial supply of the spinal cord

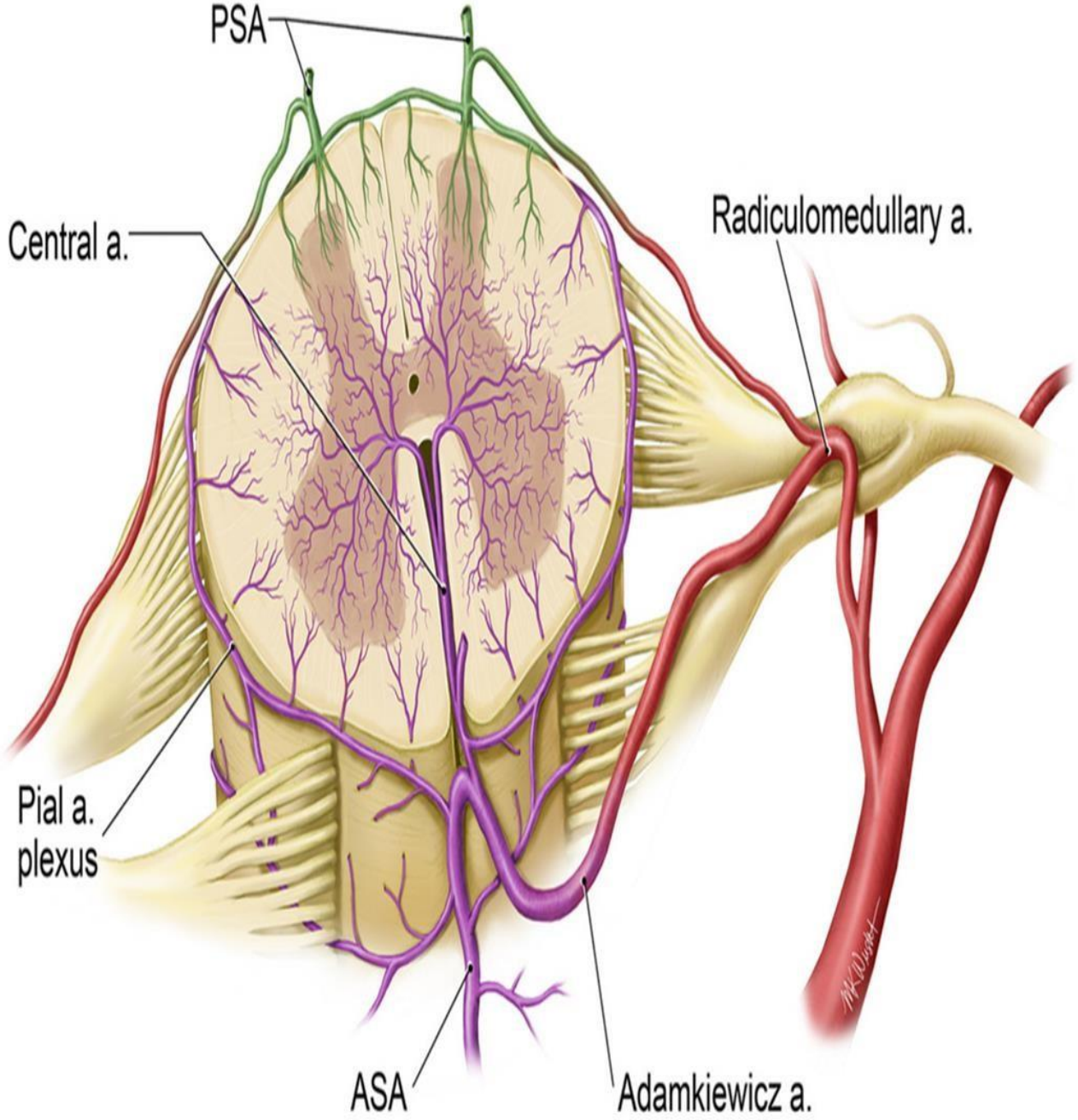
3. Radicular Arteries:

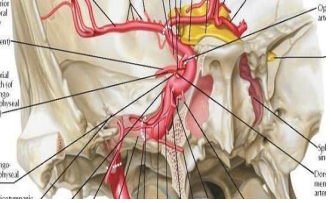
- **They are the major source of blood to the lower two-thirds of the spinal cord.**
- **They enter the vertebral canal through the intervertebral foramina and divide into anterior and posterior branches which join the anterior & posterior spinal arteries.**
- **They are branches from:**

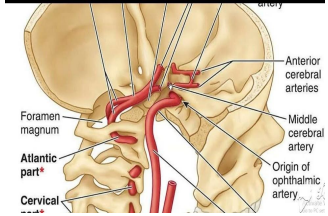
In the neck: from the vertebral & ascending cervical arteries.
In the thorax: from the intercostal arteries.
In the abdomen: from the lumbar arteries.
In the pelvis: from the lateral sacral arteries.

Venous drainage of the spinal cord:

- **The veins correspond to the arteries and drain into the internal vertebral venous plexus present in the epidural space.**







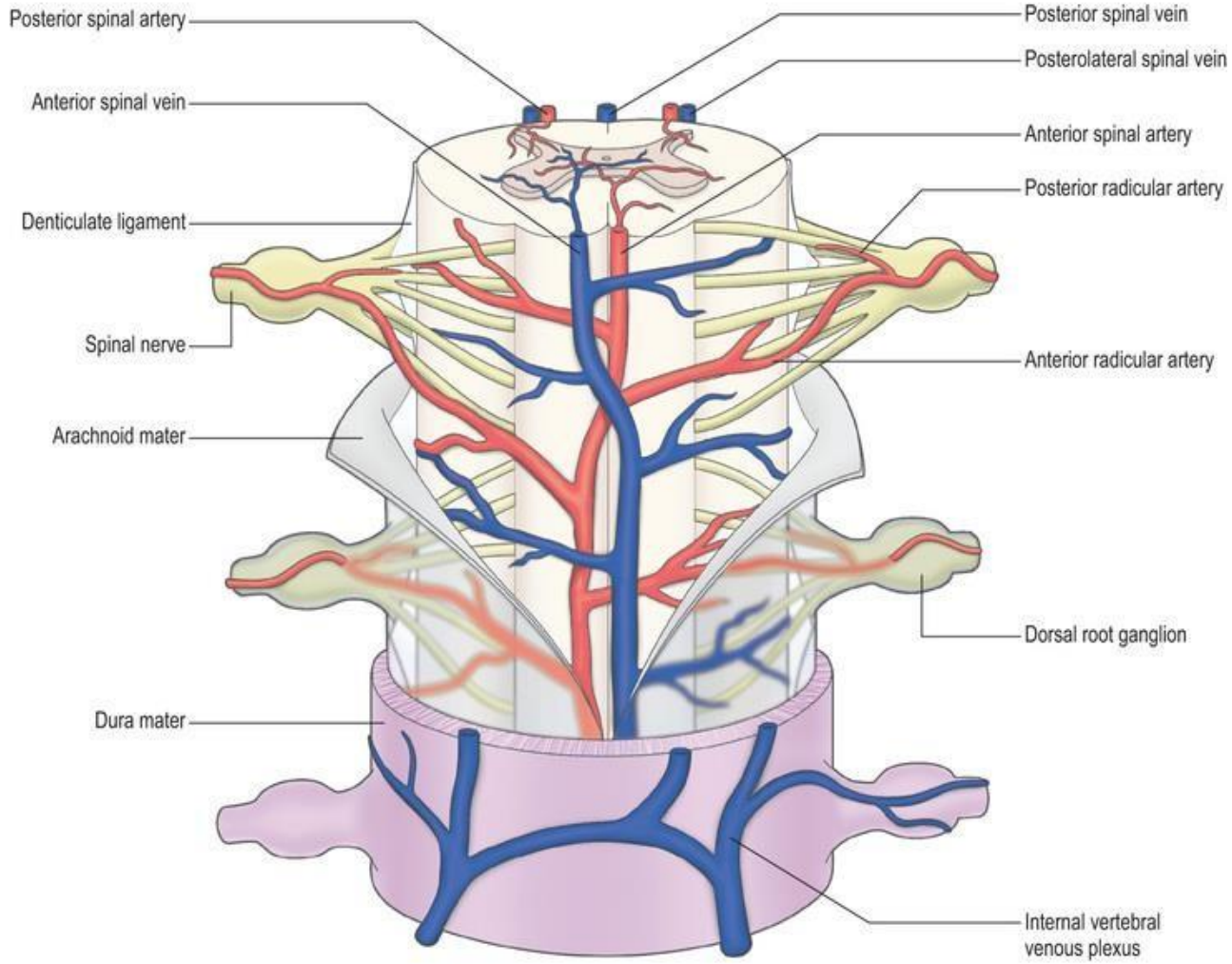
Arterial supply of the spinal cord

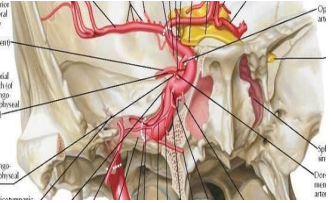
Vasculature of the spinal cord

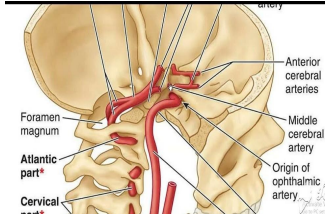
- **The spinal cord is supplied by the anterior and posterior spinal arteries, supplemented by radicular arteries.**
- **Venous drainage is by anterior and posterior spinal veins, which drain, via radicular veins, into the internal vertebral venous plexus.**

Occlusion of the anterior spinal artery, usually secondary to dissection of the descending thoracic aorta, leads to an acute thoracic cord syndrome with paraplegia and incontinence.

The spinothalamic modalities of pain and temperature are preferentially lost, whereas the proprioceptive functions of the dorsal columns are relatively preserved.







Posterior spinal vein

Posterior spinal artery

Posterolateral spinal vein

Pia mater

Anterior spinal vein and artery

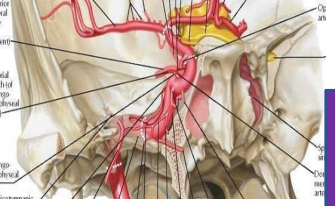
Posterior
Anterior
} Radicular arteries

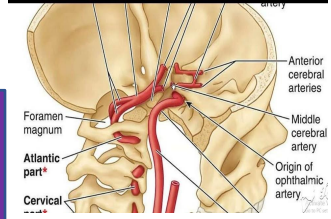
Arachnoid mater

Spinal artery

Dura mater

Internal vertebral venous plexus and fat in epidural space





Quiz

Which of the following best describes the internal carotid artery?

A. One of two terminal branches of external carotid artery

B. It supplies the occipital lobes and the brain stem

C. It connects with the posterior cerebral artery through anterior communicating artery

D. It connects with the posterior cerebral artery through posterior communicating artery

E. It has a straight course along its length

Answer:

(MCq & SAq)

* IMportant notes of Blood supply Dr:- Gaballah.

Internal Carotid Artery :-

* origin بتاعه ⇒ (upper or lower ممكن يجي سؤال هو) (MCq)
* Course بتاعة
* Termination ⇒ (Lateral To optic chiasma) (MCq)
  (dividing into ....) (MCq.)

(MCq) * Carotid Siphon Consists of ... [Cavernous + supracavernous]

↓

مهم الكتب انهم

U shaped in angiogram

* Part 1 & part 2 of Internal Carotid Artery important for protect.

(الصورة اللي في الملف مهمة، الدكتور نبه عليها)

Branches of Internal Carotid artery :-

* The neck no has branches. # مهم
* مهم تحفظ الفروع كلها

* Posterior Communicating artery [اهمهم]

[MCq] :- Midbrain + Thalamus + hypoThalamus Mainly supplied by...

* Chorid Plexus ⇒ نركز عليه

* معلومة الدكتور ذكرها :-

The nerve which consists of (vein + aretry) together is ....
opThic nerve.

Anterior cerebral artery => (ACA)

* مهم عشان اركز على
- ORigin. [iT's The smaller one]
- ends. at ..... [MCQ]
- Course.

Branches of it:-
- مهم نعرف انه بيعمل supply لـ
  Parietal & frontal Lobe [✓]
  occipital Lobe [X] (No)
- Anterior Charotid => Internal charotid.
- AICa supply => basilar artery (معظم الـ basilar جاية من AICa).
- 4Th ventricle -> PICA.
- Posterior Chariodal => 3Th ventricle + lateral.

* clinical notes => مهمة جداً جداً.

Posterior Cerebral Artery:- (PCA)

- بيغذي الـ occipital Lobe*
- [course - origine - seperated from] ---> (مهم)
- Branches نباتنه أهمها:-
  [Central branches + posterier Chariodal artery]

Middle artery:

* أشهر مكان يحصل فيه (embolism + creberal hemorady)
* لو فيه جلطة او حاجة بيكون سببها الأكبر الـ cerebellar middle artry

- IMPortant CorTical Areas supplied by ----. (مهمة جداً جداً جداً)
- [Cours + end + origin + clinical notes]

* Deep Cerebral Veins:- (SAQ) لازم

- Veriebral Artery:-

أهم حاجة أركز عليها من فروعه هي

(* anterior spinal artery.
* occlusion of it)

* PICA supplies ----- [لازم] (SAQ)

Basilar artery:-

85% ⇒ AICA جاي من بنسبة

supplies Internal ear.

Arterial supply of spinal cord.


Thank
You!