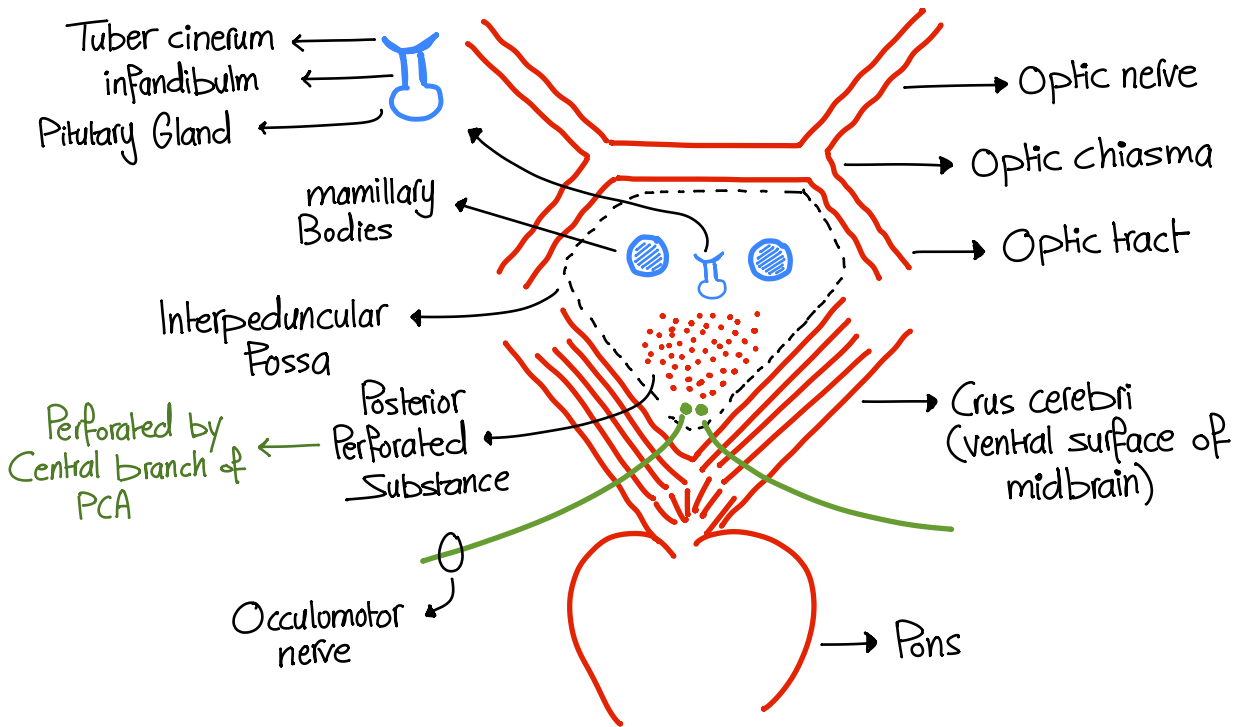


General notes before we begin:

- 1- 15%-20% of our cardiac output goes to the brain
- 2- Infarction of the brain cortex begins minutes to hours after the stroke (and if it is curable, the treatment will be initiated several days after the stroke is established)
- 3- Brain strokes are considered the 3rd cause of death worldwide

The interpeduncular fossa (located on the ventral surface of the midbrain and it is surrounded by the circle of Willis)

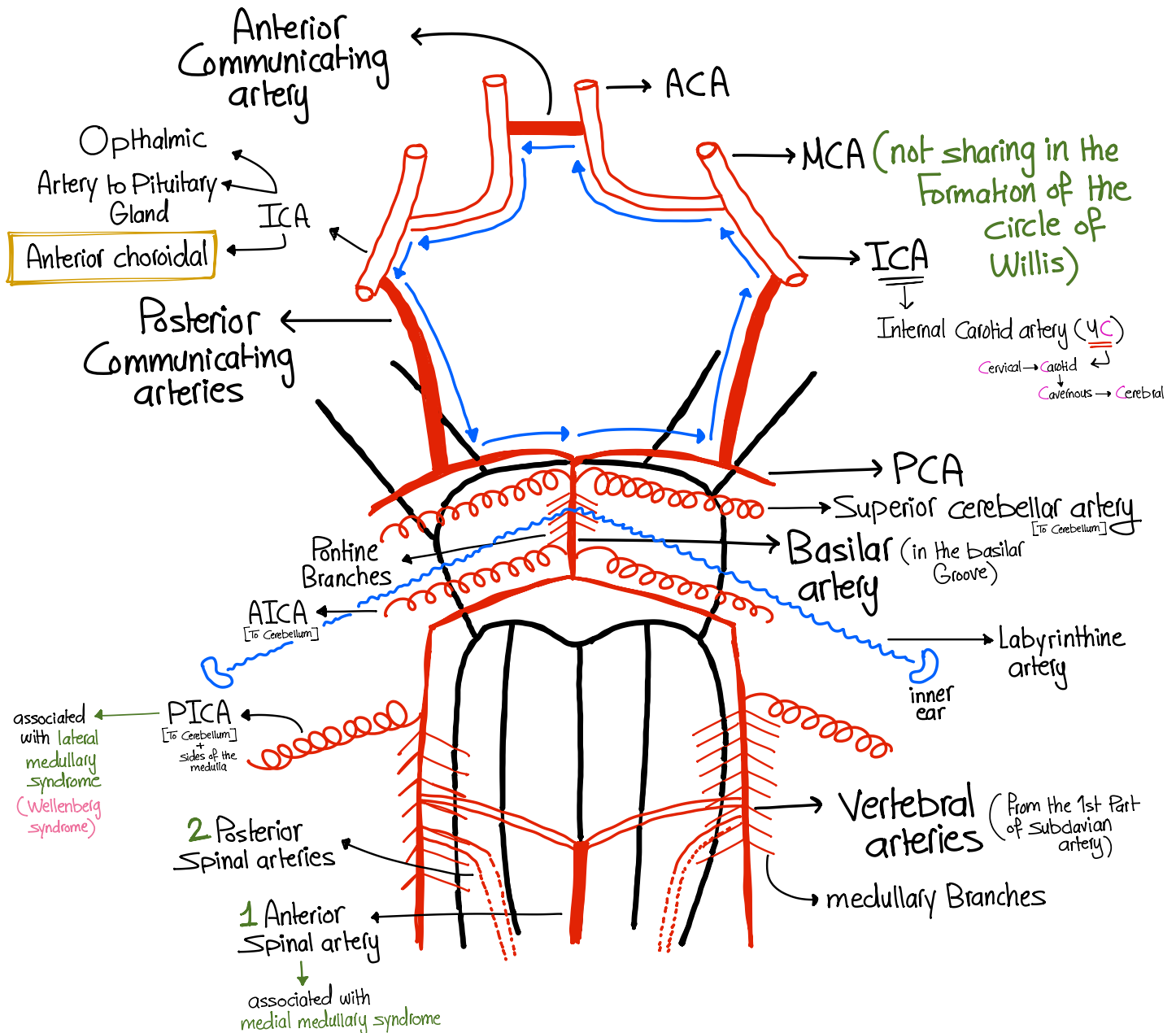


Circle of Willis : connection between **the anterior circulation (carotid circulation)** -from the internal carotid artery- and **the posterior circulation (vertebro-basilar circulation)** -from the vertebral artery-

The physiological significance of this connection is that if any occlusion happens to one of the arteries that supply the brain (either the ICA or the vertebral artery) the other can **compensate**.

The anterior circulation accounts for 70% of the brain blood supply and the other 30% is for the posterior circulation.

The circle of Willis is located in **the subarachnoid cisterna** (specifically the **interpeduncular cisterna**)



The question could be about the branches of certain artery for example:

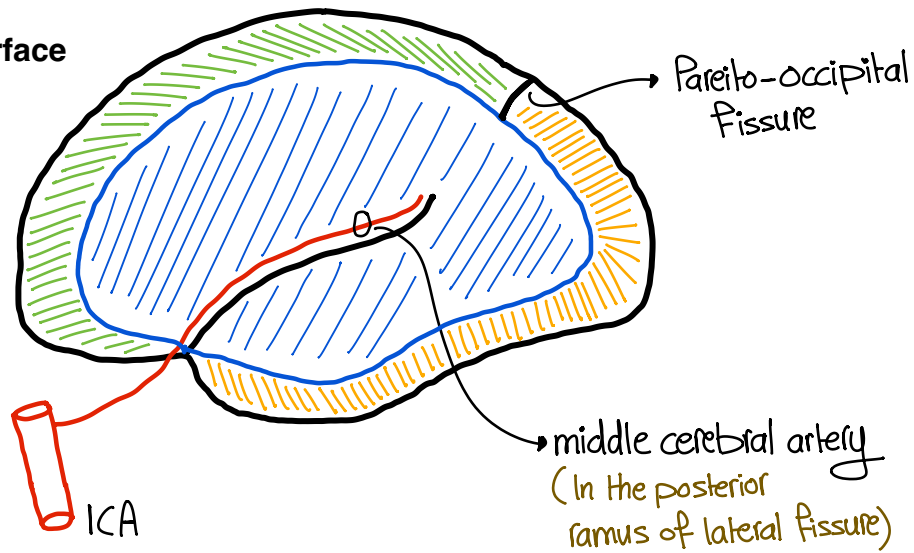
Branches of **the vertebral artery** (medullary branches, anterior spinal artery, posterior spinal arteries and the **posterior inferior cerebellar arteries**)

Branches of **the basilar artery** (pontine branches, **superior cerebellar arteries**, **anterior inferior cerebellar arteries** and the Labyrinthine arteries)

Branches of **the internal carotid artery** (ophthalmic, artery to pituitary gland and the most important one is the anterior choroidal artery)

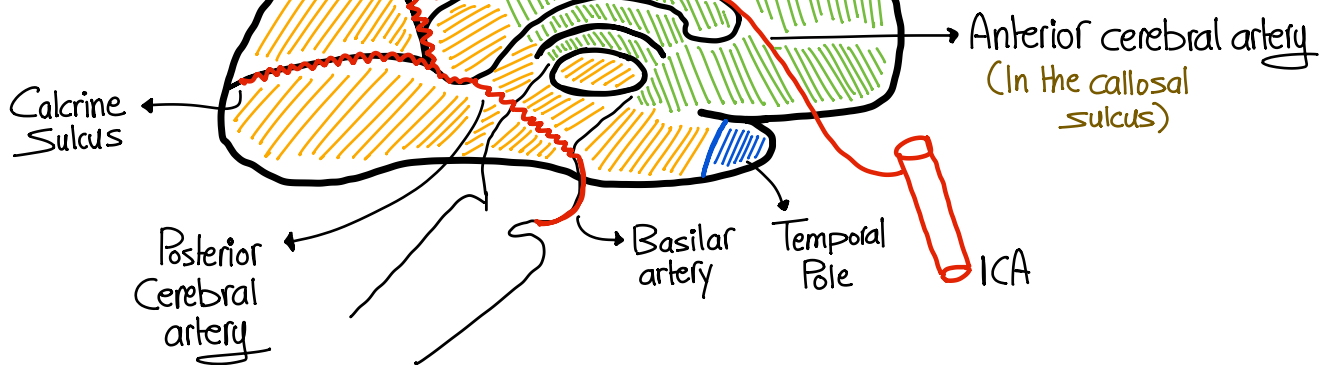
Note: the arteries highlighted in green supply the cerebellum, notice that two of them are branches from the basilar artery (**the major blood supply of the cerebellum**)

Lateral surface

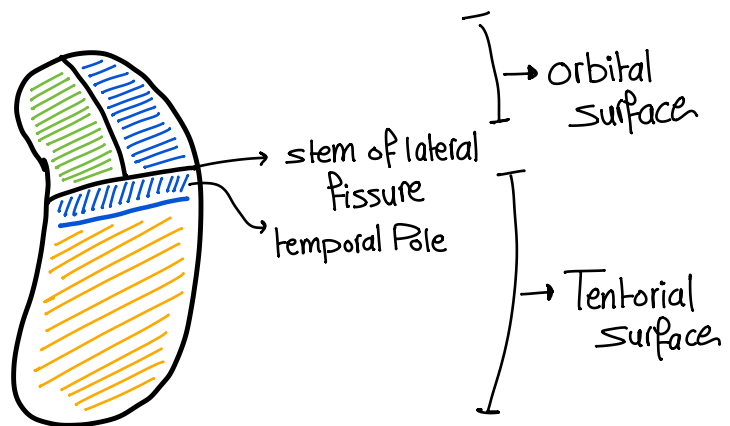


Paretto-Occipital Fissure

Medial surface



Inferior surface



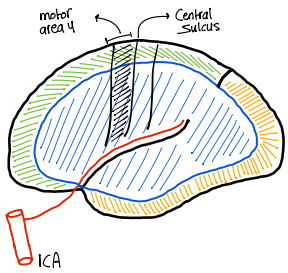
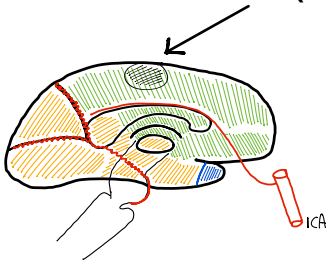
The anterior cerebral artery: most of the medial side including the corpus callosum (except the splenium), the septum pellucidum and the fornix + the upper 1 inch on the lateral side + the medial half of the orbital surface.

The middle cerebral artery: all the lateral side except the upper 1 inch and lower 1 inch + the temporal pole + the lateral half of the orbital surface.

The Posterior cerebral artery: from the paretto-occipital fissure in the medial side to the all tentorial surface + the splenium of corpus callosum + thalamus + the lower 1 inch in the lateral side.

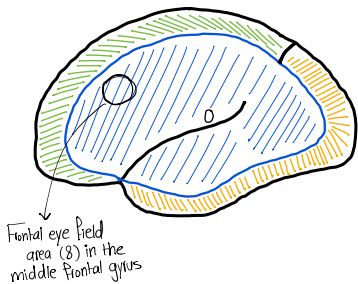
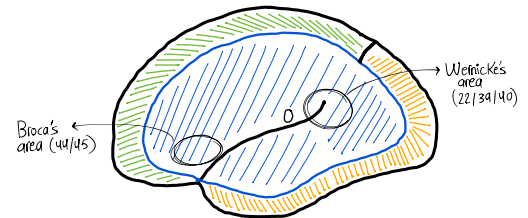
Let's take these scenarios:

A lesion in this area (**the paracentral lobule**) : **anterior** to the central sulcus in the paracentral lobule (Motor to the area of the lower limb below the knee + sphincters) and **Posterior** to the central sulcus in the paracentral lobule (sensory to the area of the lower limb below the knee)...**occlusion in the ACA** will make the patient **lose sensation and motor control to the area below the knee + incontinence**



Remember that the body is represented upside down as a homunculus in the motor area 4 so accordingly, the upper 1 inch in the lateral surface represents the thigh. In conclusion, almost all the lower limb is supplied by the ACA (**the lower limb will be spared in case of occlusion in the MCA**) and this applies to both motor and sensory.

Occlusion in **the MCA in the left dominant hemisphere** → (motor aphasia/ non-fluent aphasia) in Broca's area + (sensory aphasia/ fluent aphasia) in Wernicke's area...because both areas are supplied by the MCA



The frontal eye field area (area 8) is found in the middle frontal gyrus and it is responsible for the conjugate eye movement to the opposite side and the lesion in this area is **ipsilateral**. For example, if an occlusion happens in the MCA on the right side, both eyes will go to the right side

