

Al- Mustaqbal University College

First stage.

Department of Optometry(Optics)



جامعة المستقبل الاهلي  
مرحلة الاولى

قسم التقنيات البصرية

# Head and neck anatomy

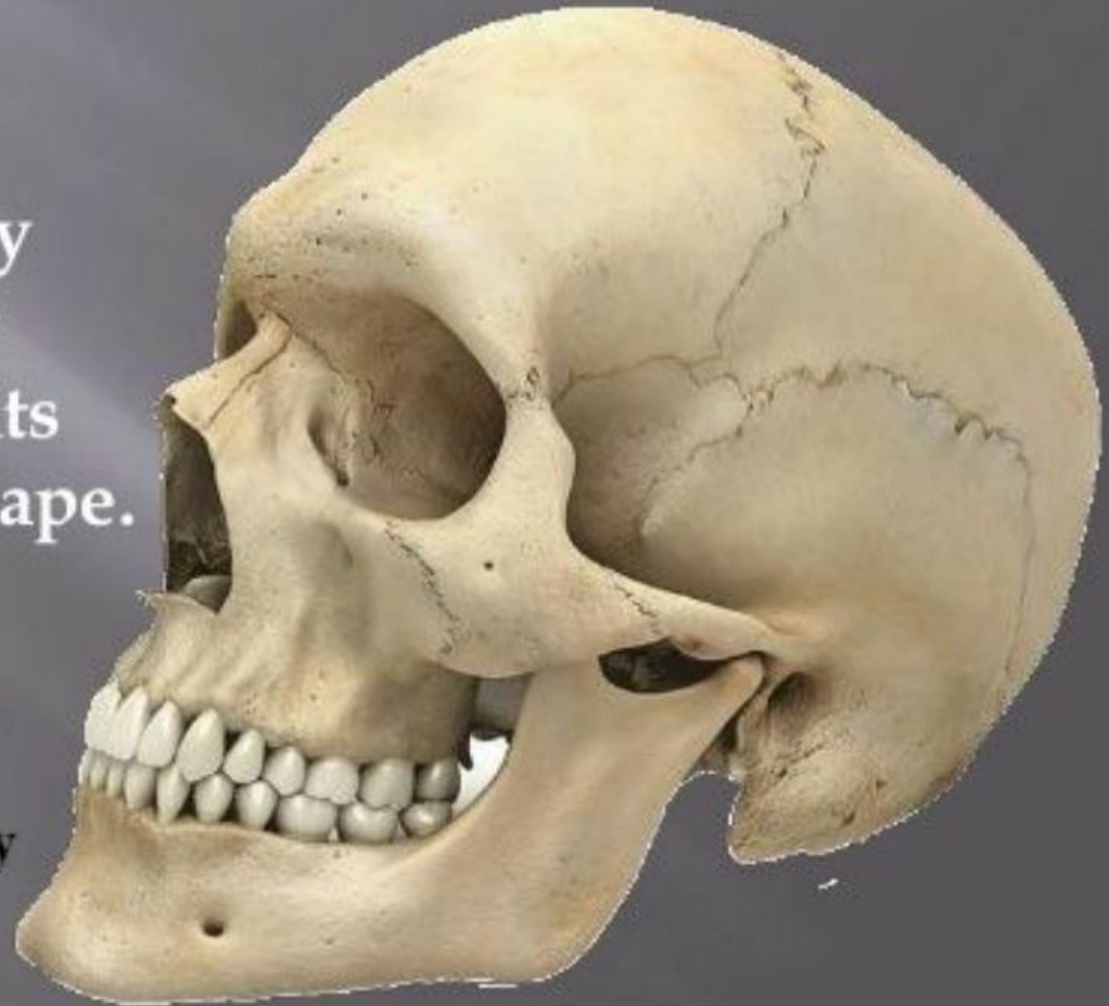
## Lec. 4

### *Bones of Skull*

Dr. Marrwan Hisham Mohamed

- ▣ Skull is the bony framework, that gives the head, its characteristic shape.

**. The function of the skull is to protect the soft and the vital tissues of the head, particularly the brain.**



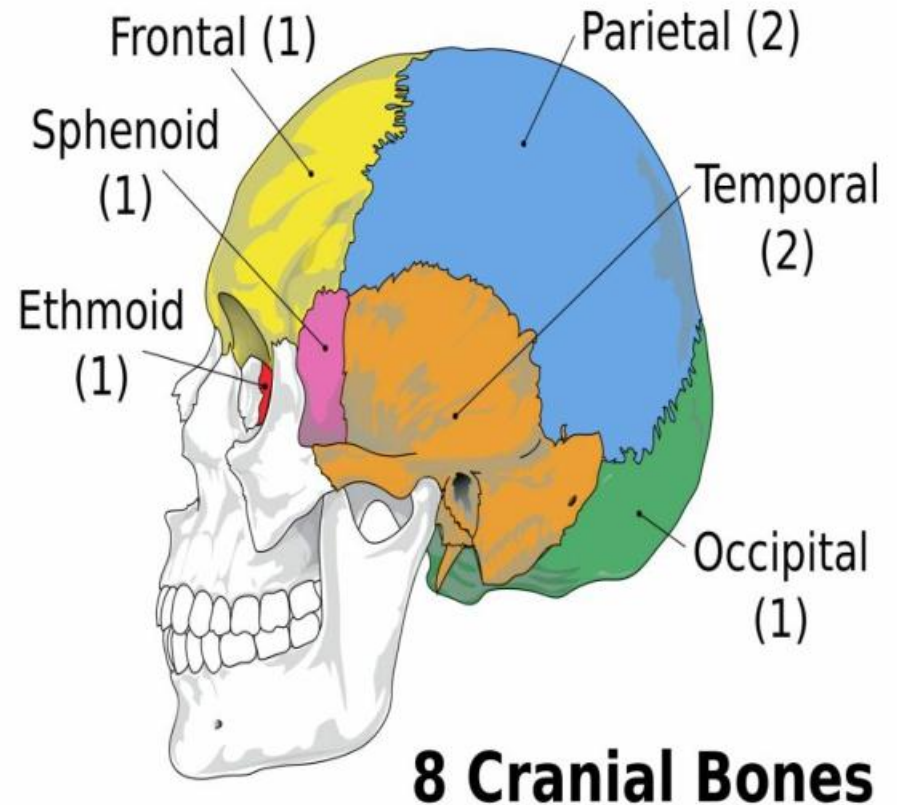
The skull is composed of 22 bones, 8 in the cranium and 14 in the face.



# Cranial Bones

The cranium is formed by 8 flattened bones two of which are paired which include:

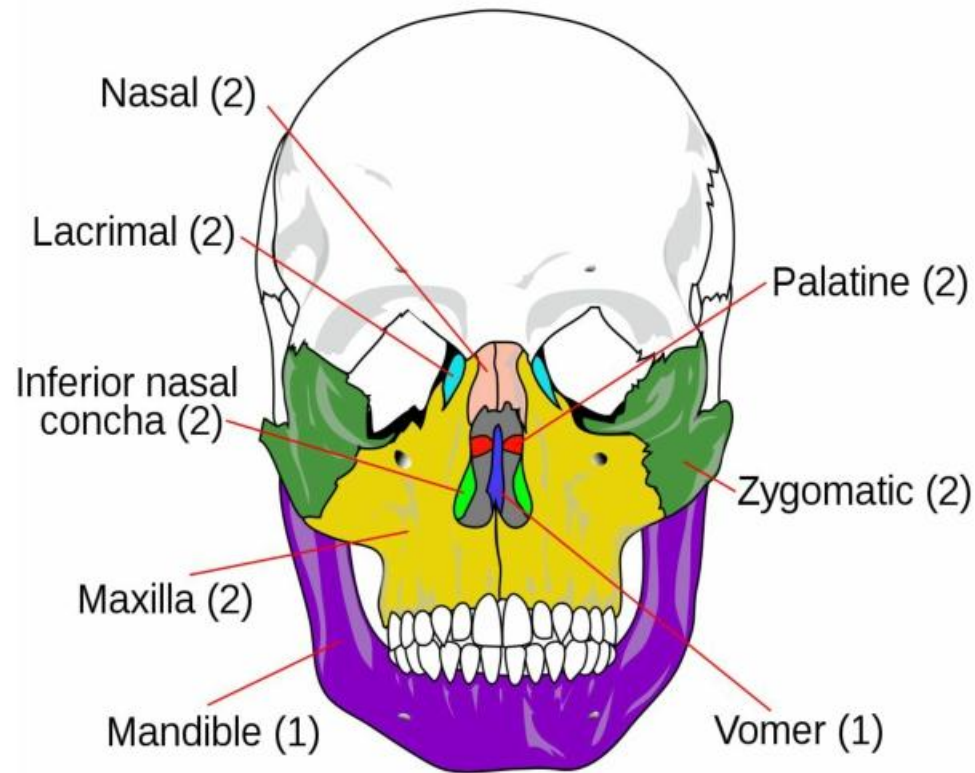
1. **Frontal bone** (1)
2. **Parietal bone** (2)
3. **Occipital bone** (1)
4. **Temporal bones** (2)
5. **Sphenoid bone** (1)
6. **Ethmoid bone** (1)



# Facial Bones

- There are 14 facial bones, all except the mandible being united by structures that are immovable:

1. Zygomatic bones (2)
2. Lacrimal bones (2)
3. Nasal bones (2)
4. Vomer (1)
5. Palatine bones (2)
6. Inferior conchae (2)
7. Maxillae (2)
8. Mandible (1)



**14 facial bones**



# Paranasal sinuses

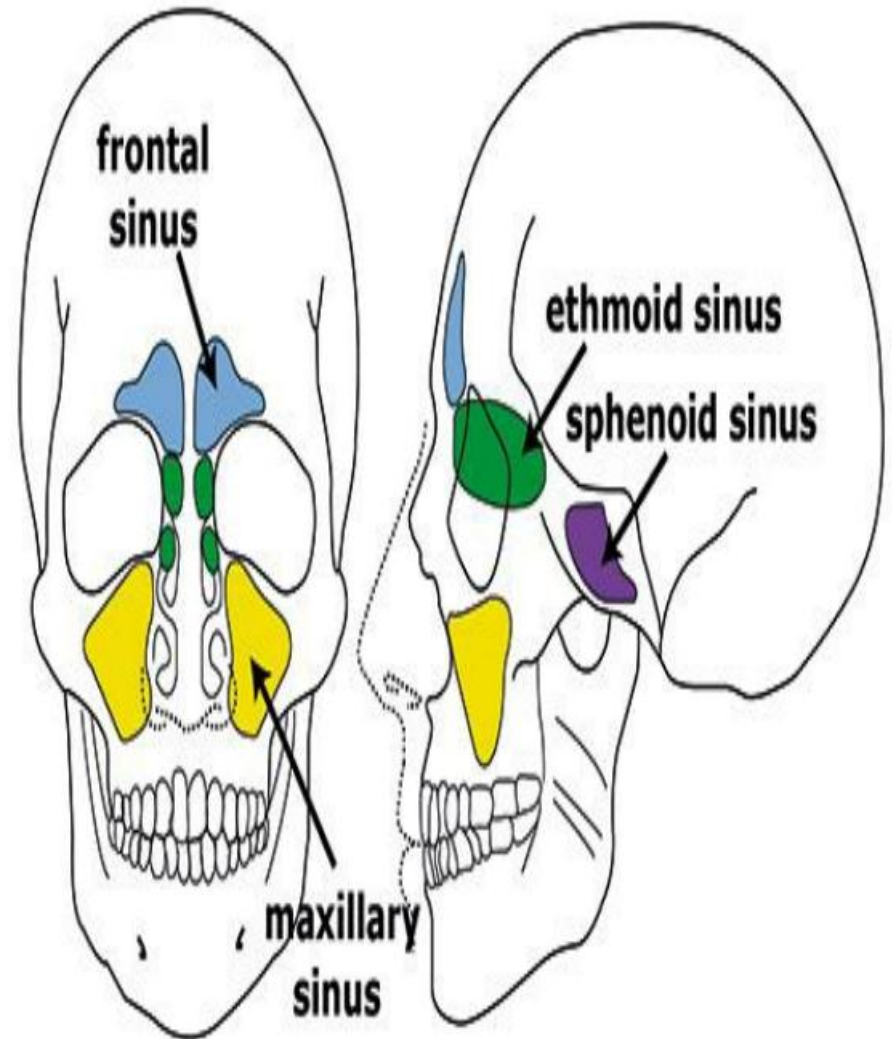
Air filled sacs found in the skull

bones, these sacs surround the

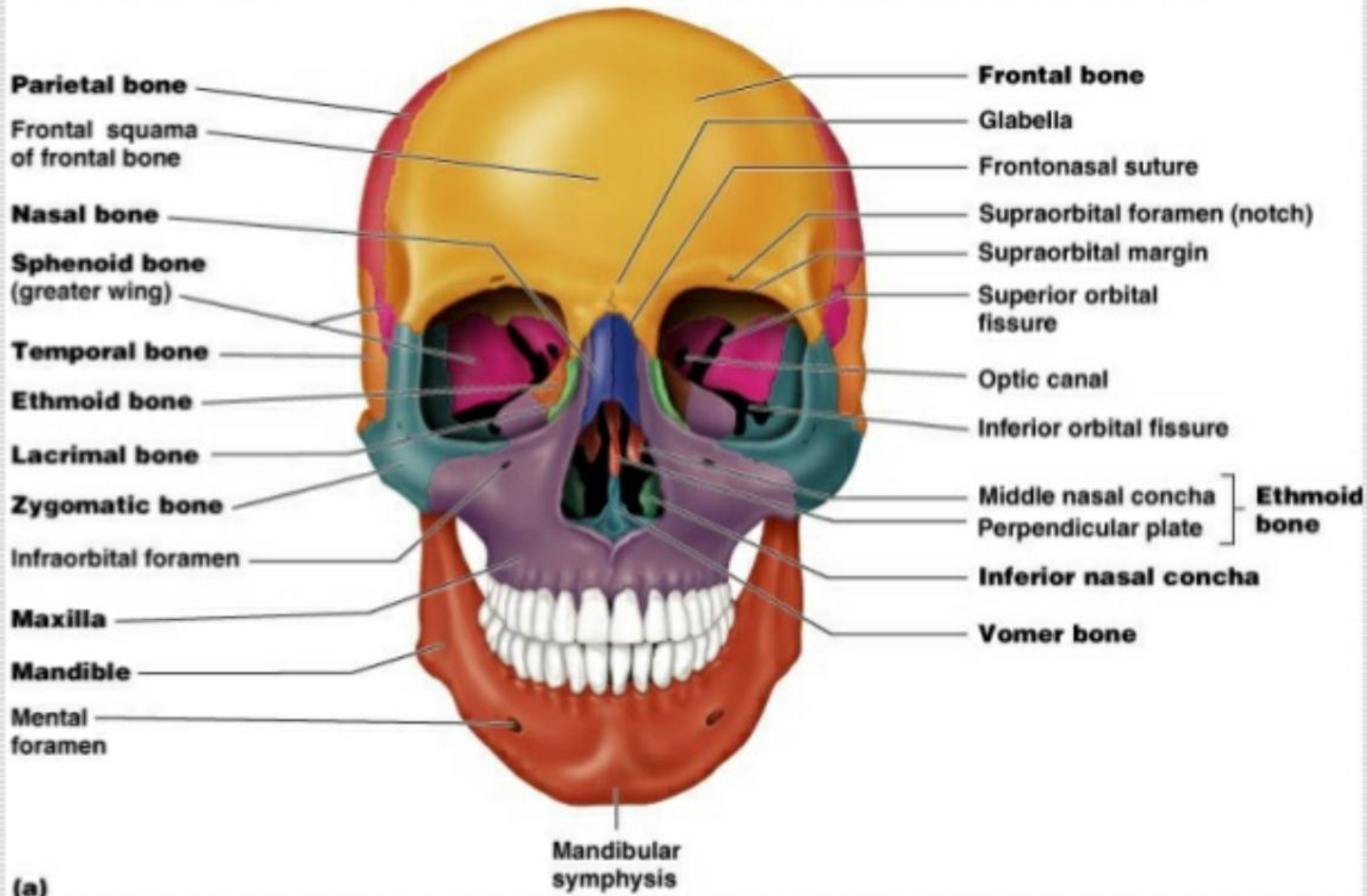
**nasal cavity,**

They are paired structure, include **frontal ,maxillary, ethmoidal and sphenoidal sinuses.**

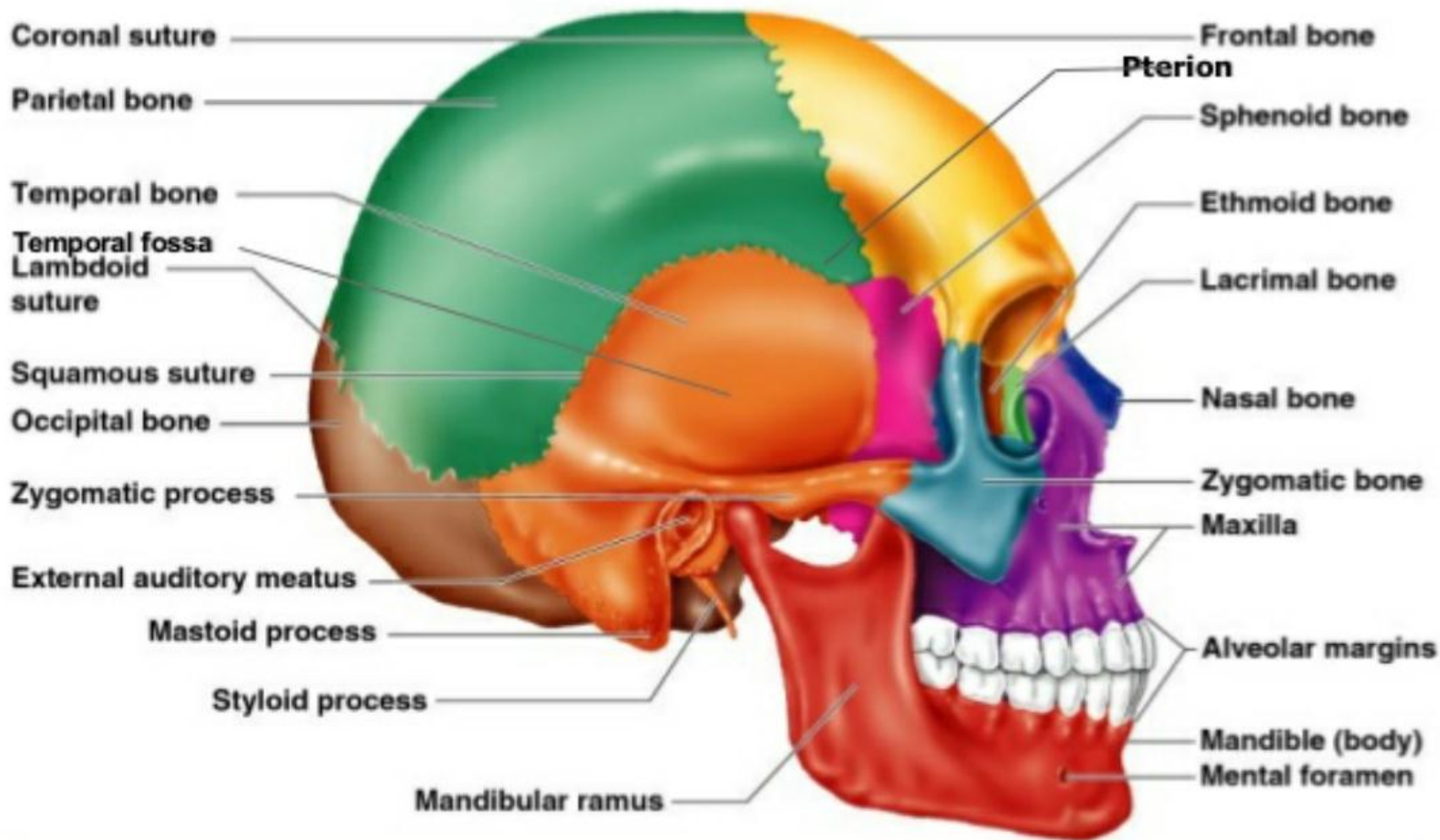
These sinuses are lined with **mucous membrane.**



# Bones of the Skull (Anterior view)

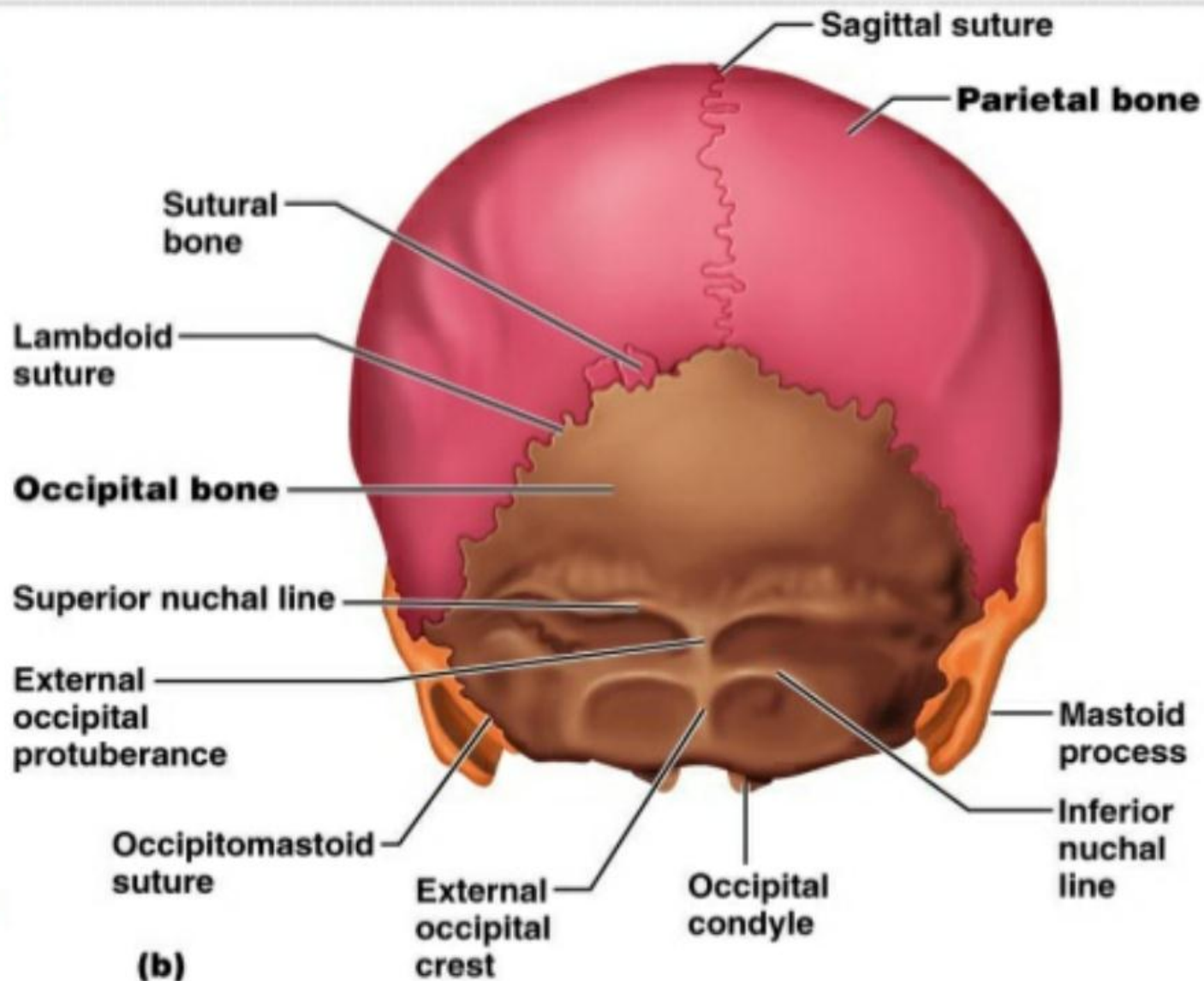


# Bones of the Skull ( Lateral view)





# The Skull – Posterior View

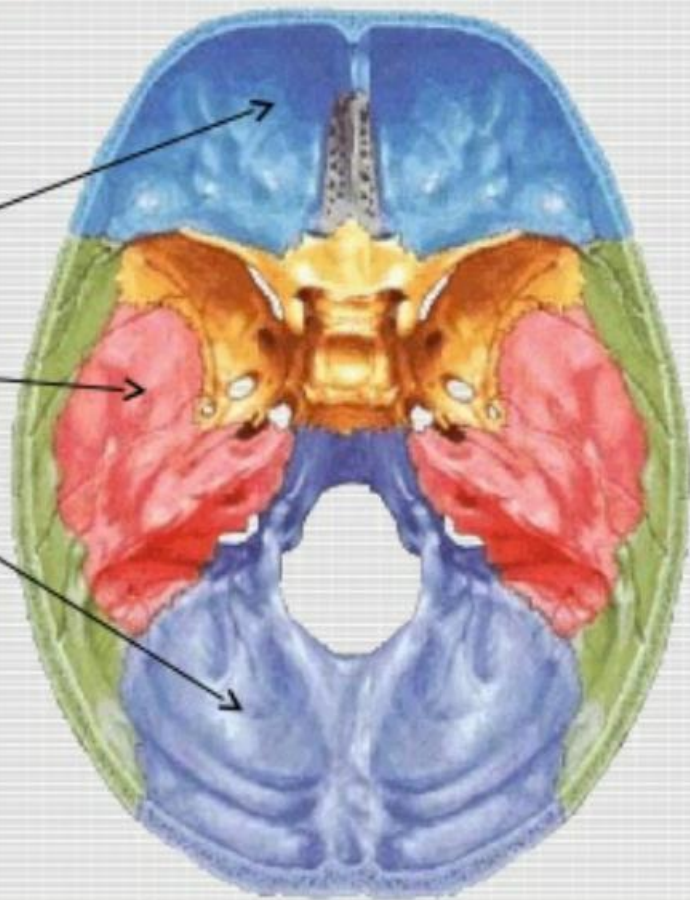


# Internal view of base of skull

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## Base of skull forms three fossae

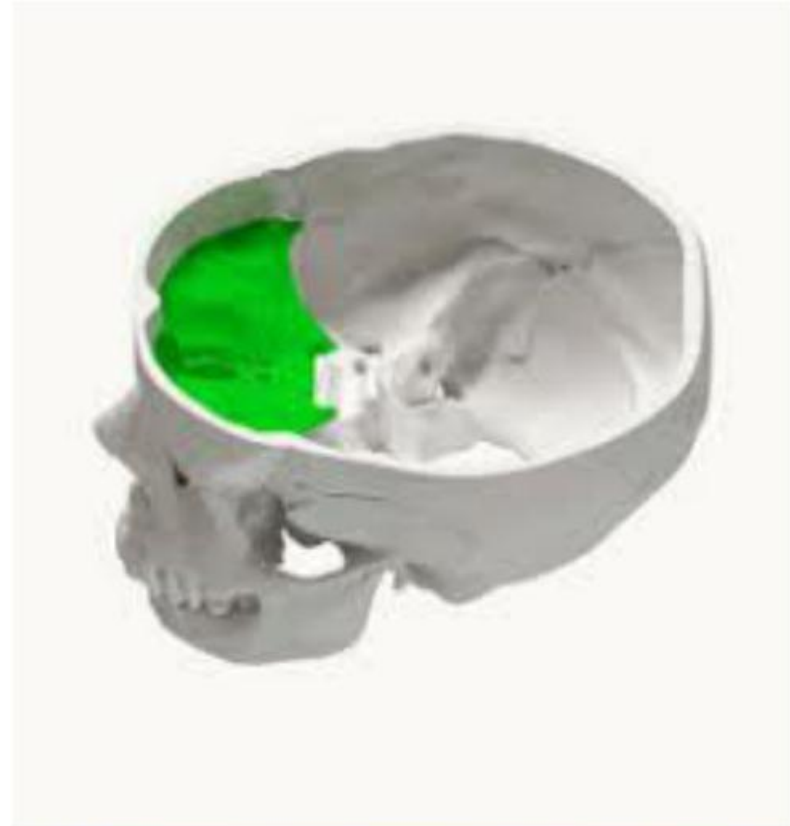
- Anterior cranial fossa
- Middle cranial fossa
- Posterior cranial fossa



- **Anterior Cranial Fossa**

- The anterior cranial fossa is the most **shallow** and **superior** of the three cranial fossae. It lies superiorly over the nasal and orbital cavities.

- The fossa accommodates the anteroinferior portions of the **frontal lobes of the brain.**





# Middle Cranial Fossa

. **Deeper** than the anterior cranial fossa, is **narrow medially** and **widens laterally** to the sides of the skull.

Its boundaries are as follows:  
**Anteriorly** and **laterally** it is bounded by the lesser wings of the **sphenoid bone**. It is separated from the posterior fossa by the **clivus** and **the petrous crest**.





# Posterior Cranial Fossa

- a small space in the skull,
- It houses the **brainstem** and **cerebellum**.
- **The cerebellum** is the part of the brain responsible for balance and coordinated movements.
- The **brainstem** is responsible for controlling vital body functions, such as breathing.
- **Anteriorly** it extends to the apex of the **petrous temporal**. **Posteriorly** it is enclosed by the **occipital bone**.

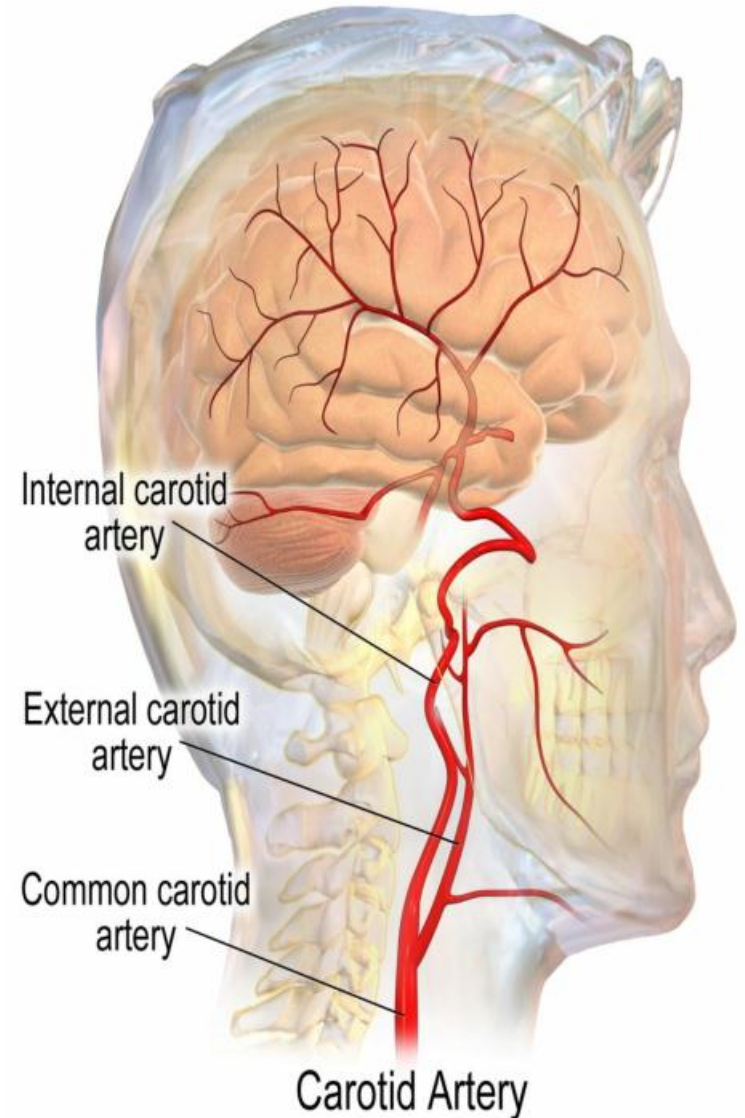


# BLOOD SUPPLY OF BRAIN

## Arterial supply of brain

- Brain is supplied by 2 sets of arteries
  - A pair of **Vertebral arteries**
  - A pair of **Internal carotid arteries**

- **Carotid Arteries:** These vessels run along the front of the neck.
  - I. Right-sided carotid originates from **brachiocephalic trunk in neck**
  - II. Left-sided carotid artery originates from **arch of aorta in thorax.**
- The common **carotid arteries** have two divisions.
  - I. **The external carotid arteries** supply the **face and scalp with blood.**
  - II. **The internal carotid arteries** supply blood to most of the anterior portion of the **cerebrum** (brain).



# Terminal Branches

- **Middle Cerebral Artery:**
  - **bigger branch of the two terminal branches**
  - It branches off frontal, parietal, and temporal branches supplying primary motor and premotor cortex, frontal eye field, primary somatosensory area.
  - **Left middle cerebral artery supplies language center.**

Occlusion of middle cerebral artery: paralysis of face, arm, aphasia (language center)



- **Anterior Cerebral Artery:**

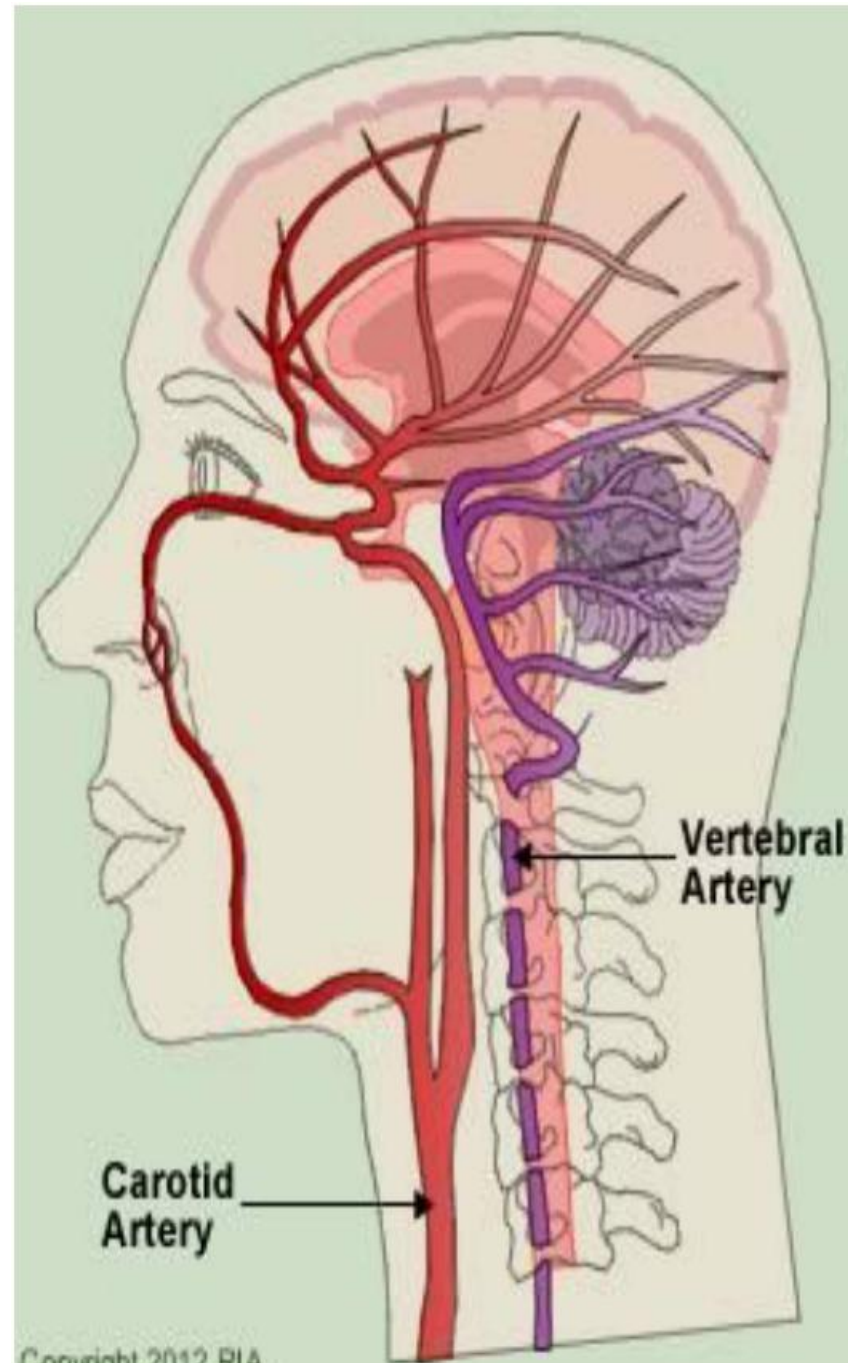
- meets together to form anterior communicating artery  
before they join, gives off recurrent artery of Heubner,  
also called **medial striate artery**, supplies **corpus  
striatum**.

**Vertebral Arteries:** These vessels run along the back of your neck. originate from the **subclavian arteries**.

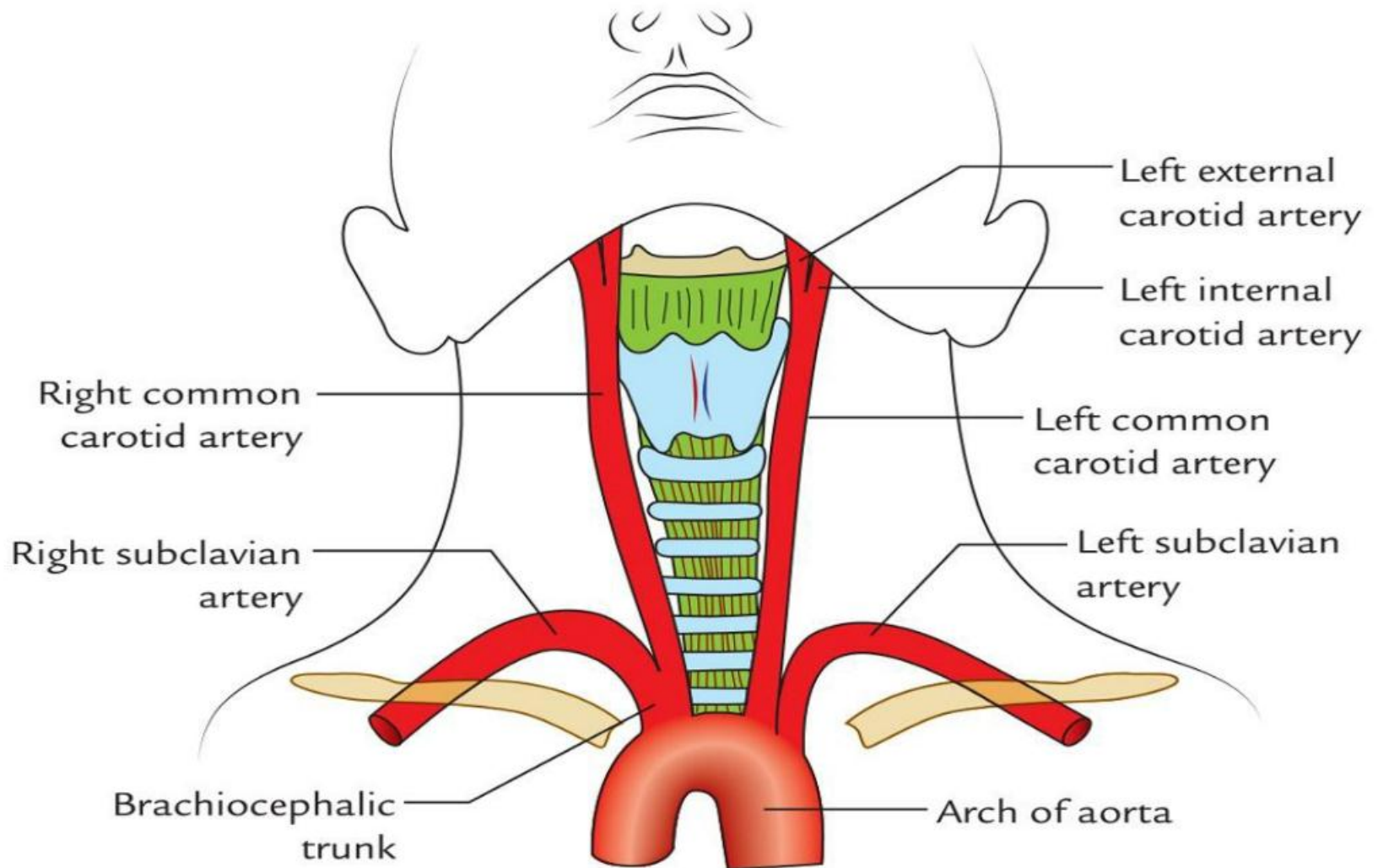
- ♠ The right and left vertebral join to form one **basilar artery**.
- ♠ The vertebral arteries supply blood to the upper **spinal cord**, **brainstem**, **cerebellum**, and posterior part of **brain**.

## **Posterior Cerebral Artery**

- The posterior cerebral arteries stem in most individuals from the basilar artery.
- Supply the **temporal and occipital lobes** of the left cerebral hemisphere and the right hemisphere.



# Carotid & Vertebral Arteries



# Circle of Willis

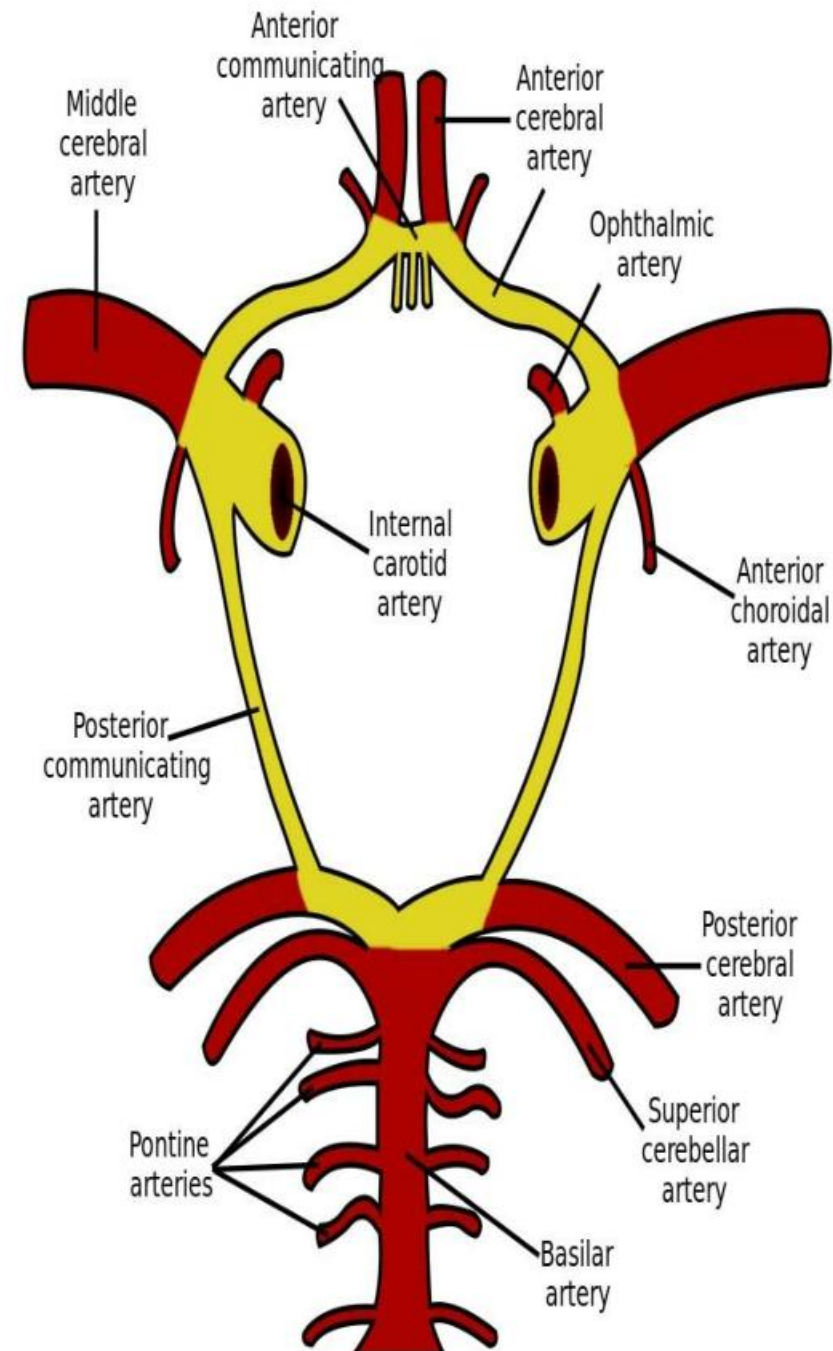
Arterial anastomosis connecting vertebasilar & internal carotid systems

## Location:

- Base of interpeduncular fossa

## Branches Involved

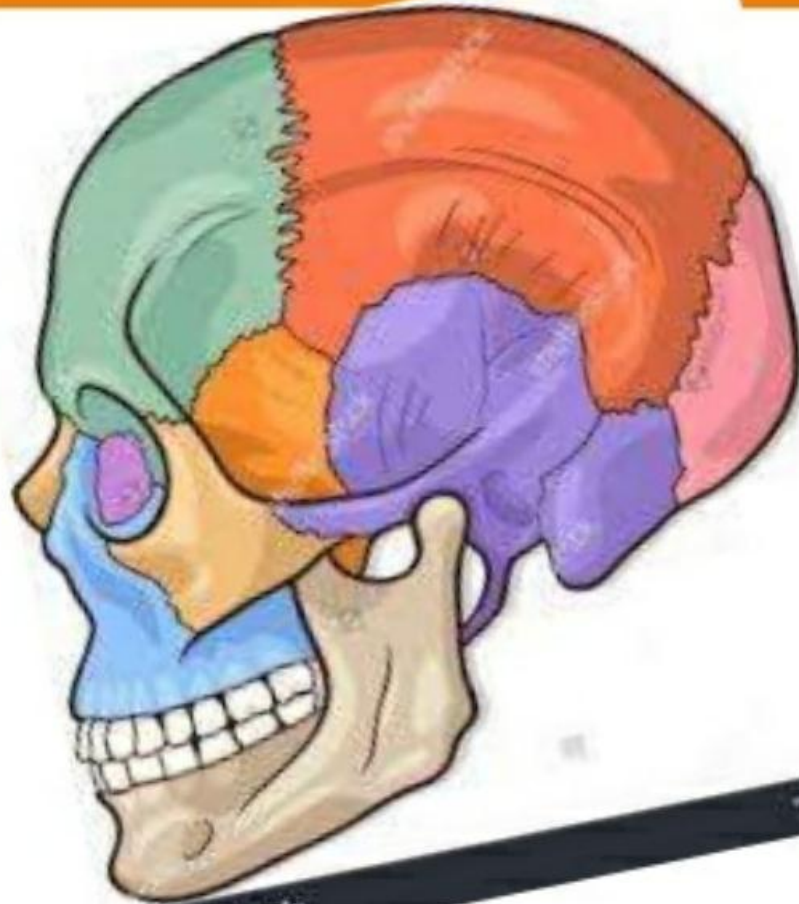
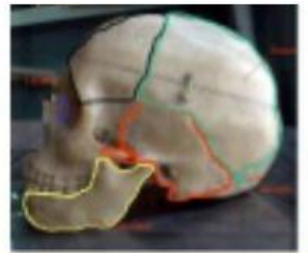
- **Anteriorly:** Anterior Communicating artery
- **Posteriorly:** Two posterior cerebral arteries.
- **Postero-laterally:** Posterior Communicating arteries.
- **Anterior-laterally:** Anterior cerebral artery.





# Importance of circle of Willis

- Serves to equalize blood flow to various parts of brain
- maintaining a constant supply of oxygen & glucose even when a contributing artery is narrowed or in head movements
- Furnishes collateral circulation in cases of occlusion of one or more of arteries contributing to the circle



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