



# Anatomy of Basal Ganglia & internal Capsule

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# Intended Learning Outcomes (ILOs)

1. Describe anatomy of the basal ganglia.
2. Describe anatomy of the internal capsule.





# Agenda

1. Anatomy of the basal ganglia.
2. Anatomy of the internal capsule.





# Anatomy of Basal Ganglia



# Basal Ganglia

Masses of grey matter deep to the floor of the lateral ventricle & are involved in motor control and cognition

= الإدراك

Components: they are composed of: A.

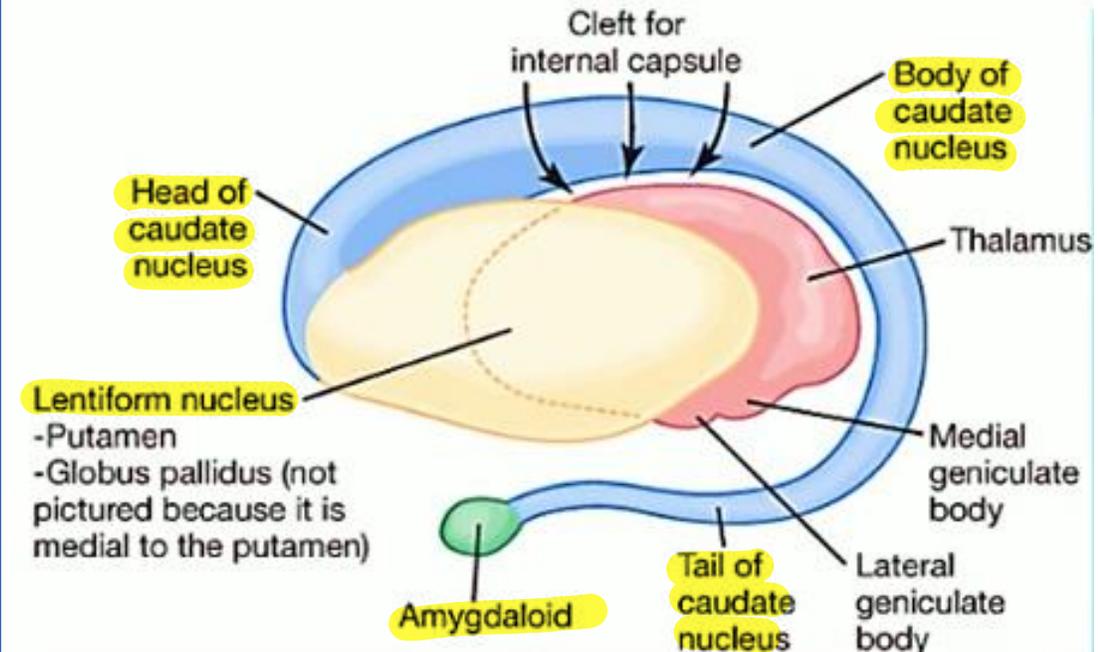
1. **Corpus Striatum**: formed of:

a. Caudate nucleus.

b. Lentiform nucleus.

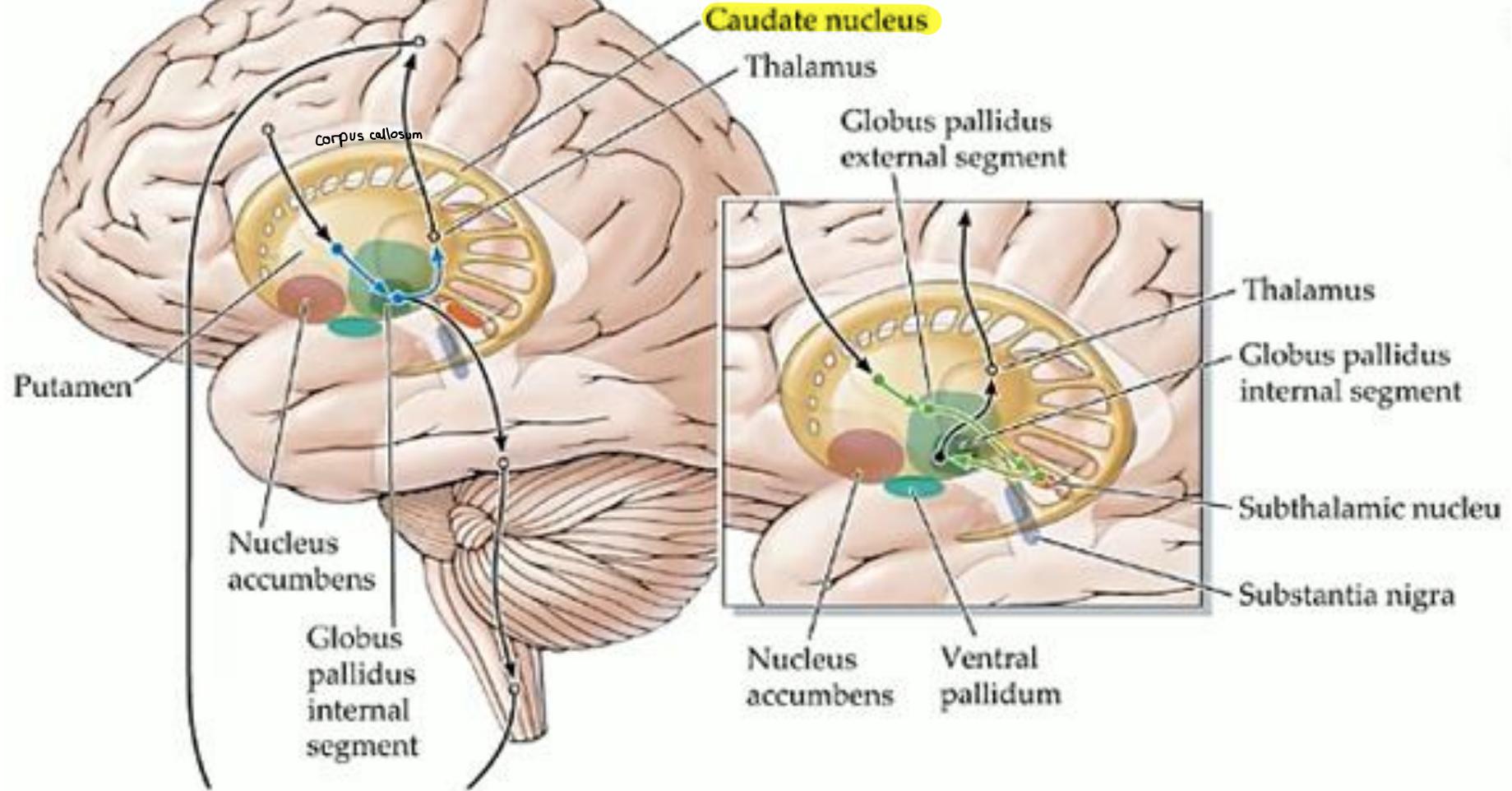
2. **Amygdaloid nucleus**: functionally, it is a part of the limbic system.

3. **Clastrum**: controversial function.

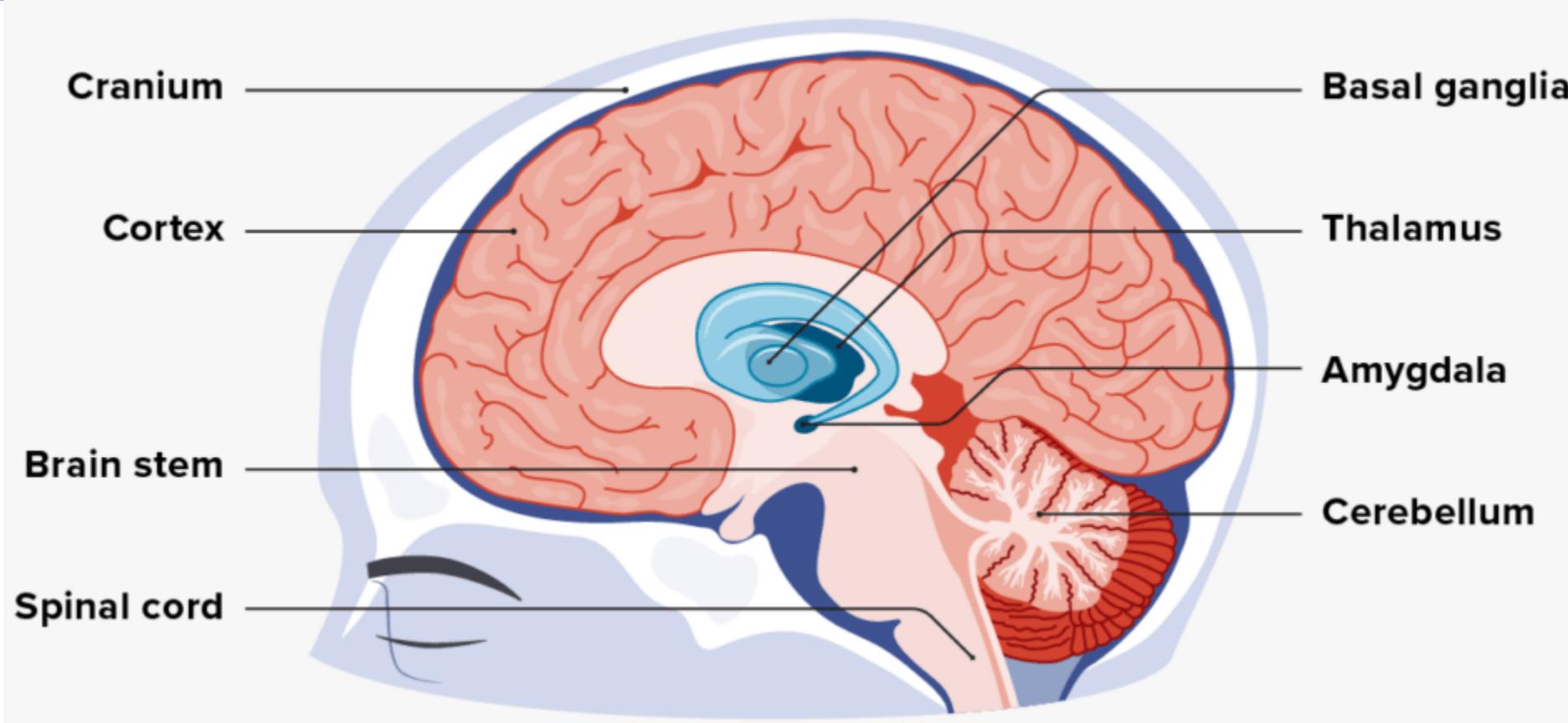


جاية من  
كلمة lens

B

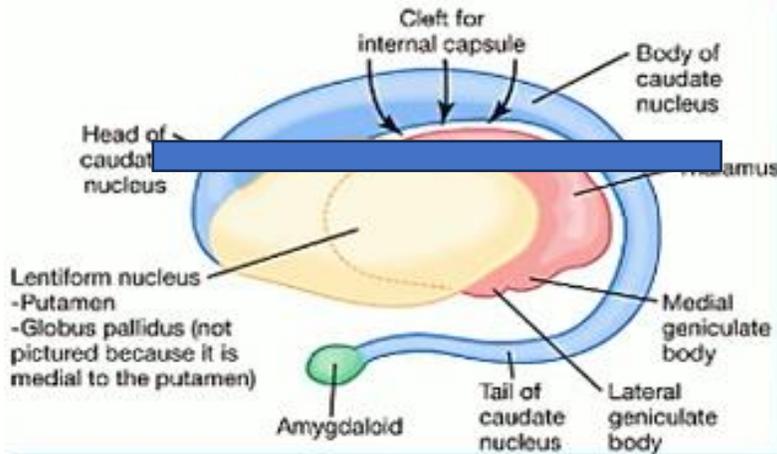


# Components of Basal Ganglia



# BASAL GANGLIA

## Corpus striatum



## Other nuclei

- **Amygdaloid nuclei:** they are part of the limbic system.
- **Clastrum:** a band of grey matter that lies lateral to lentiform nucleus, and separated from it by the external capsule. It is separated from grey matter of the insula by the extreme capsule.

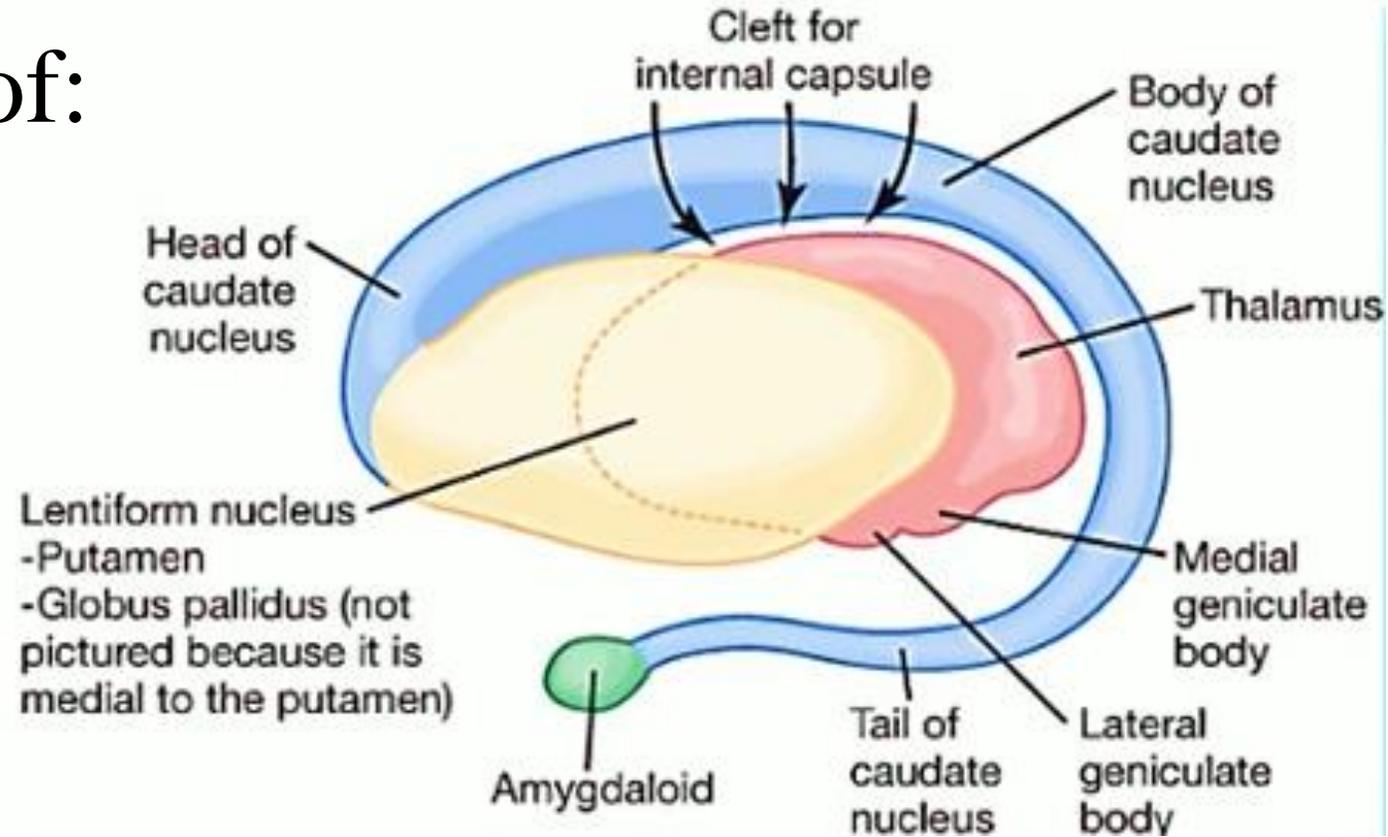


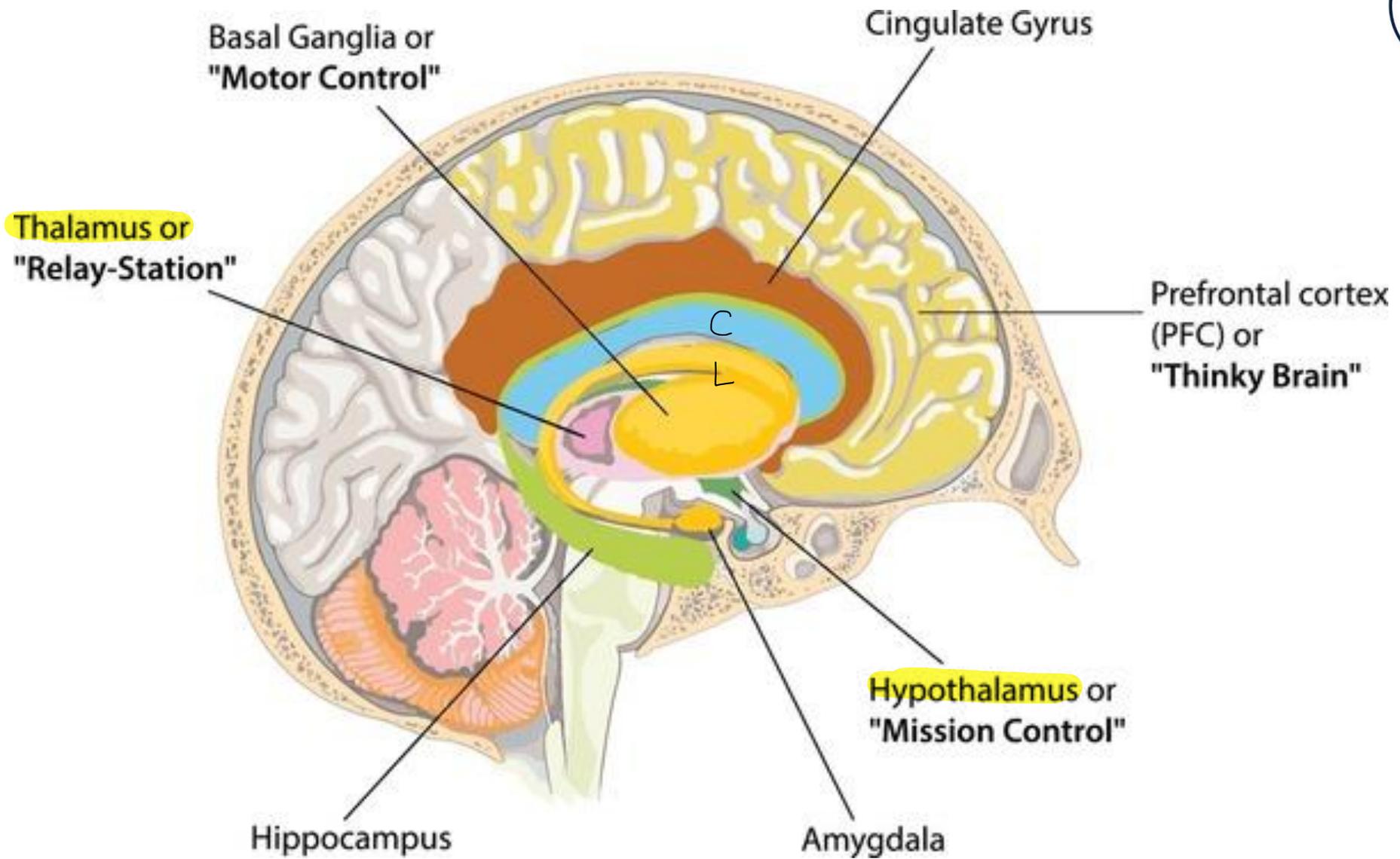
# 1. Corpus Striatum

**Corpus Striatum:** formed of:

- A. Caudate nucleus.
- B. Lentiform nucleus.

**SAQ : Describe Relation of corpus striatum / Caudata to lateral ventricle?**



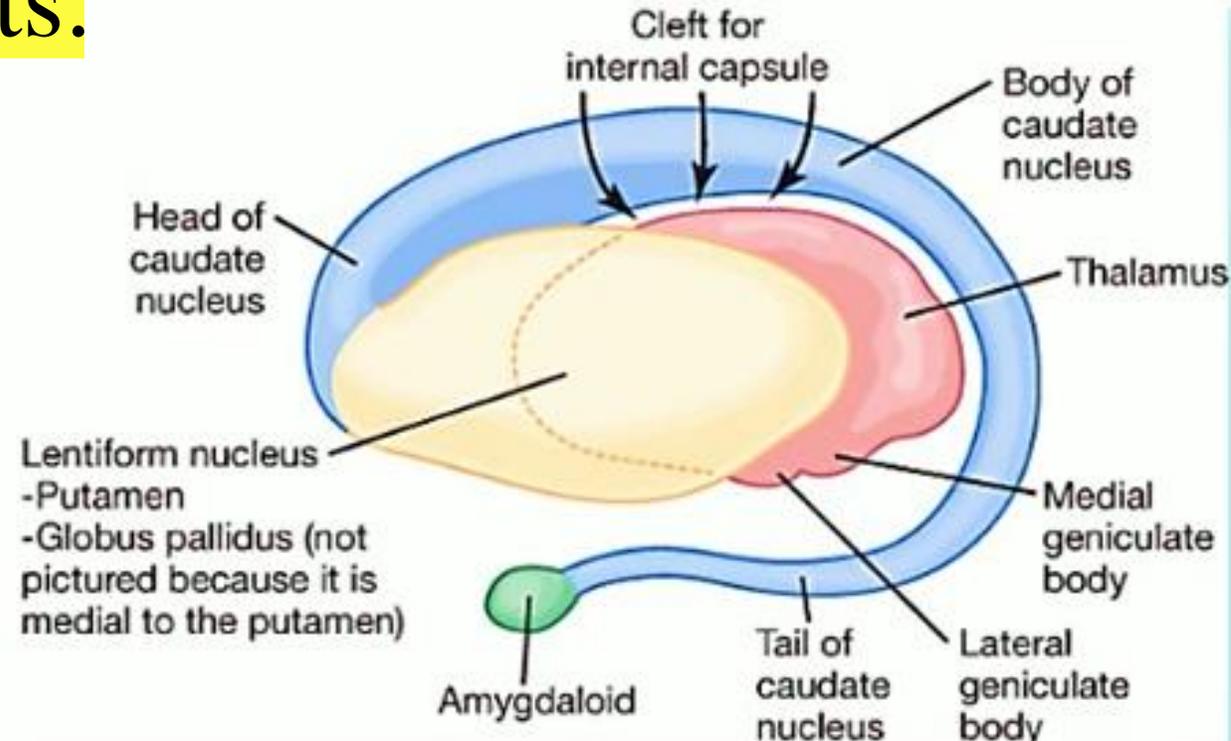


# A. Caudate nucleus

**Shape:** is a C-shaped nucleus.

**Parts:** it is formed of 3 parts:

1. Head
2. Body
3. Tail.

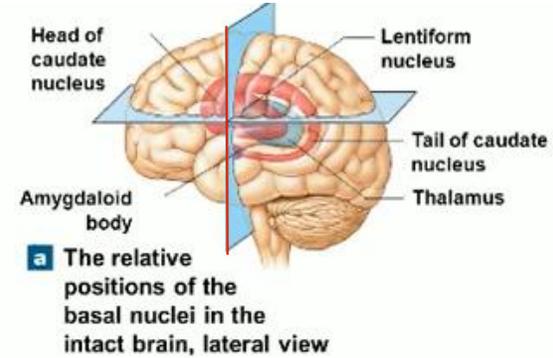


# 1. Head of caudate nucleus

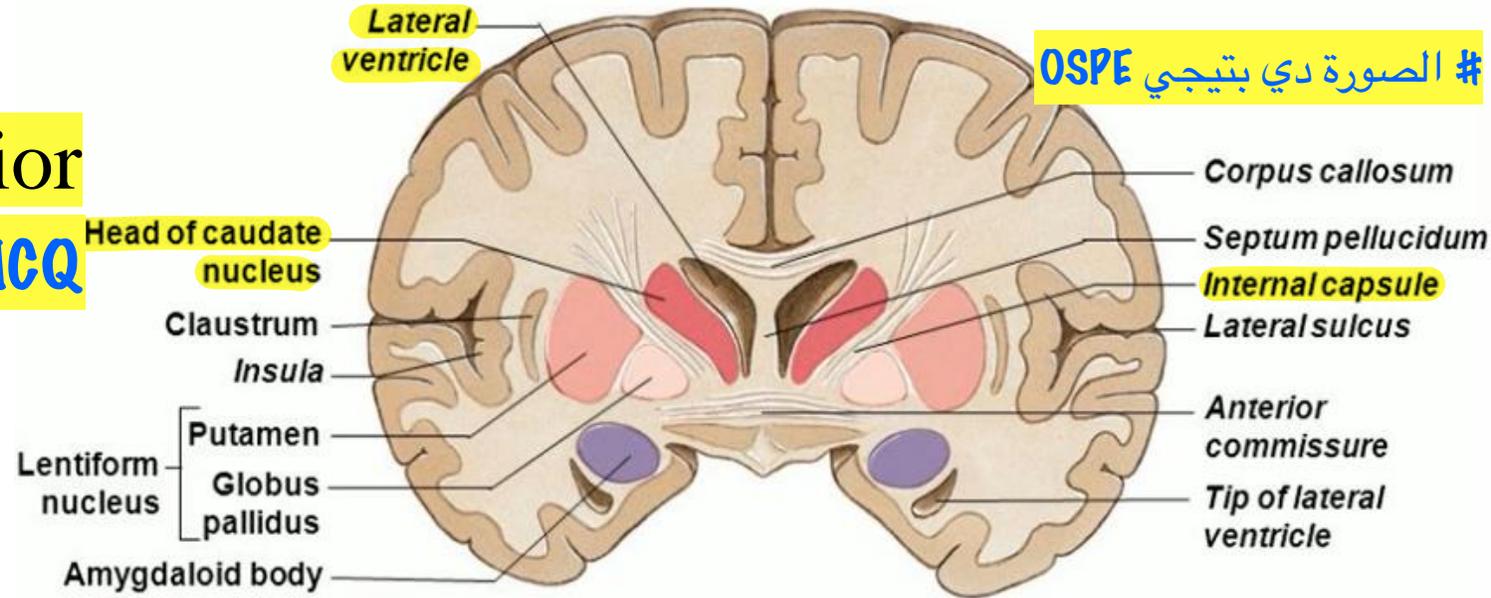
Coronal section

- It forms the lateral wall of the anterior horn of the lateral ventricle

- It is separated from the lentiform nucleus by the anterior limb of the internal capsule



# الصورة دي بتيجي OSPE



MCQ :-

- 1- Head of caudate is related medially to :  
Anterior horn of lateral ventricle
- 2- Head of caudate is related laterally to :  
anterior limb of internal capsule

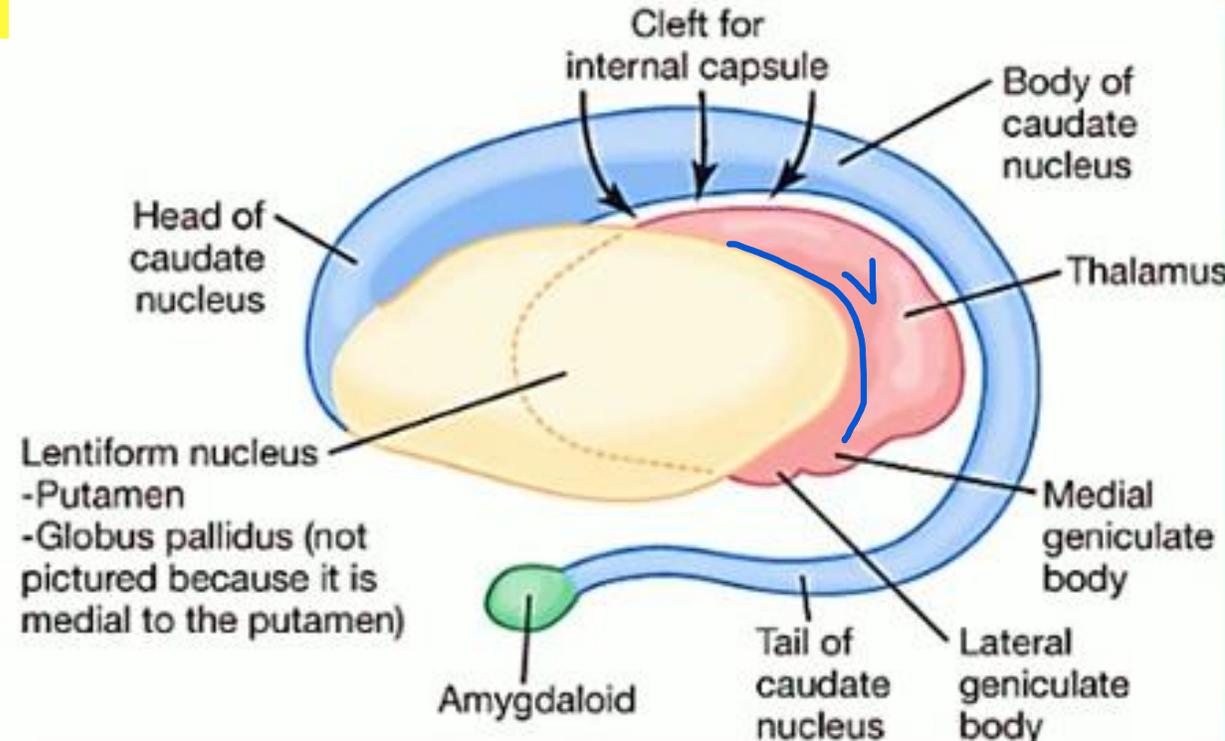
## 2. Body of caudate nucleus

ال lateral ventricle سيكون فوقه



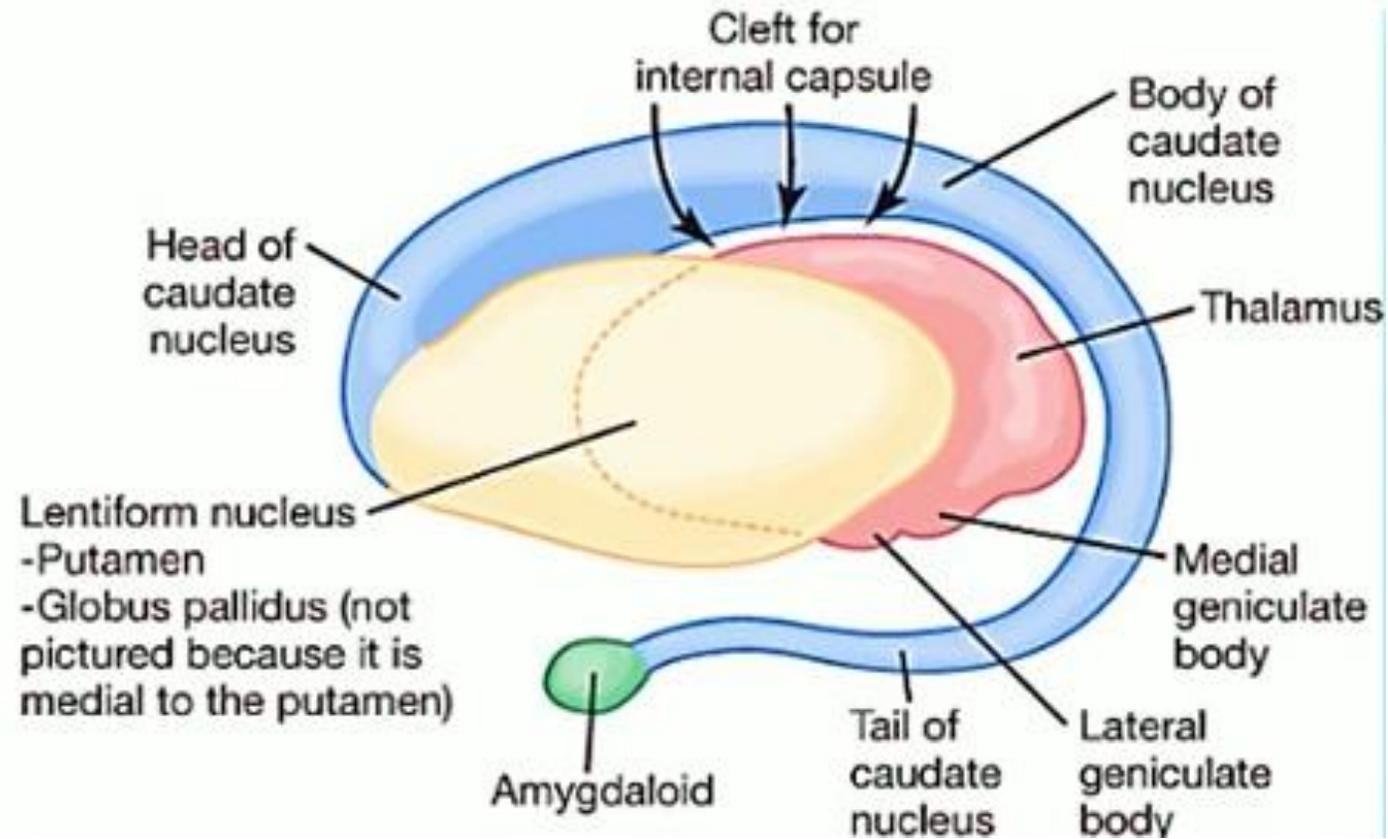
It lies in the **floor of the body part of the lateral ventricle**

It is separated from the thalamus by the **thalamo-striate vein** and the **stria terminalis** (fibers connecting the amygdaloid nucleus with the hypothalamus and septal area).



## 3. Tail of caudate nucleus

- Extends into the temporal lobe in the roof of the **inferior horn of the lateral ventricle**.
- Ends anteriorly at the **amygdaloid** nucleus.

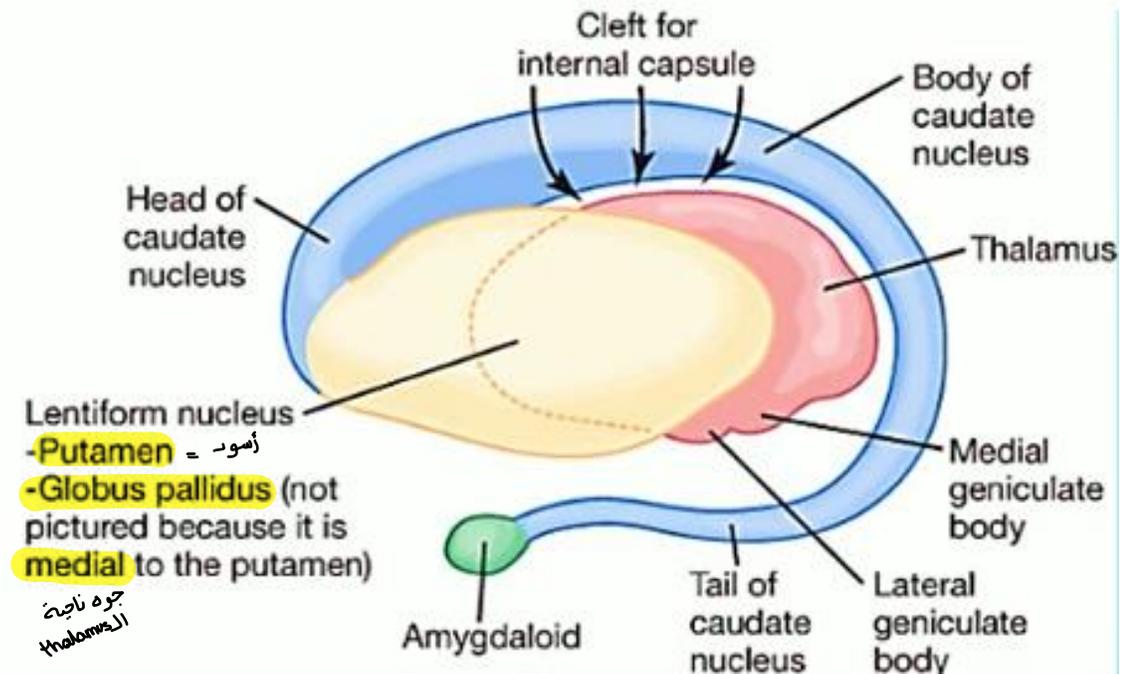


# B. Lentiform nucleus

**Shape:** wedge-shaped. Its apex is directed medially.

**Parts:** It is divided into two parts:

1. **Putamen:** is the lateral part.
2. **Globus pallidus:** is the medial part.



**MCQ : ( Globus pallidus - Putamen ) is part of : Lentiform nucleus**

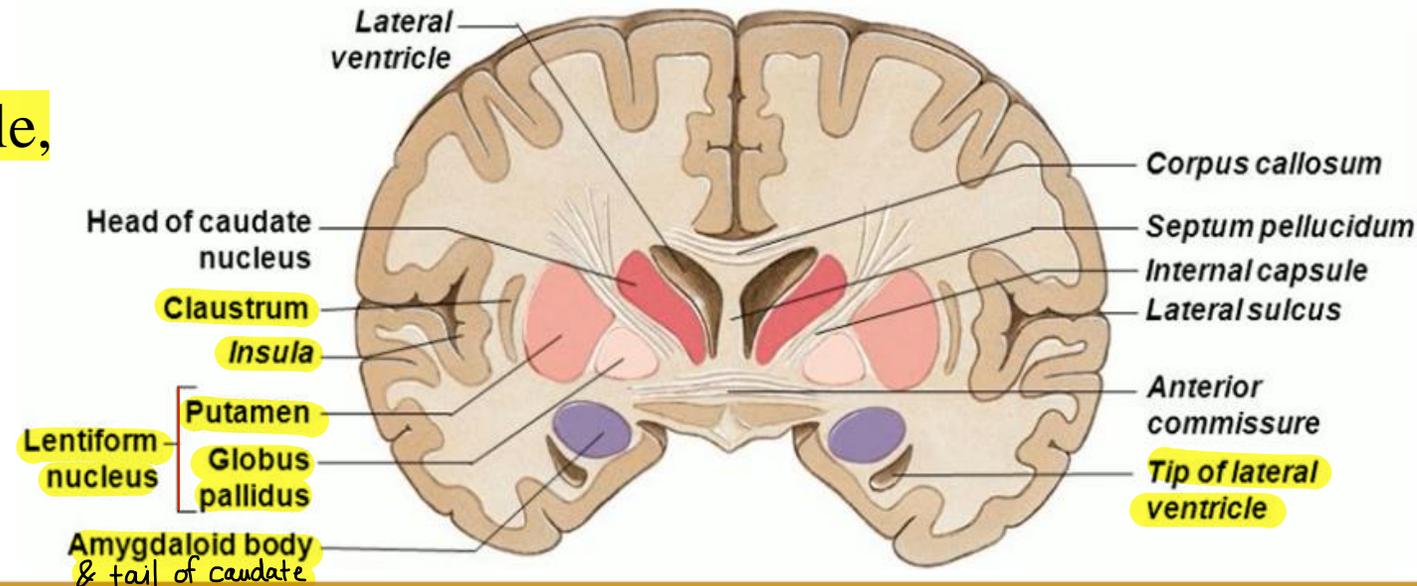
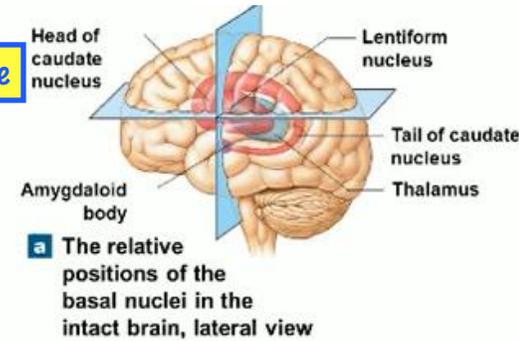
# Relation of lentiform nucleus

**Medially:** related to the **internal capsule.**

- **Anterior limb** separates it from **caudate nucleus.**
- **Posterior limb** separates it from the **thalamus.**

**Laterally:** related to the **external capsule,** which separates it from the **claustrum.**

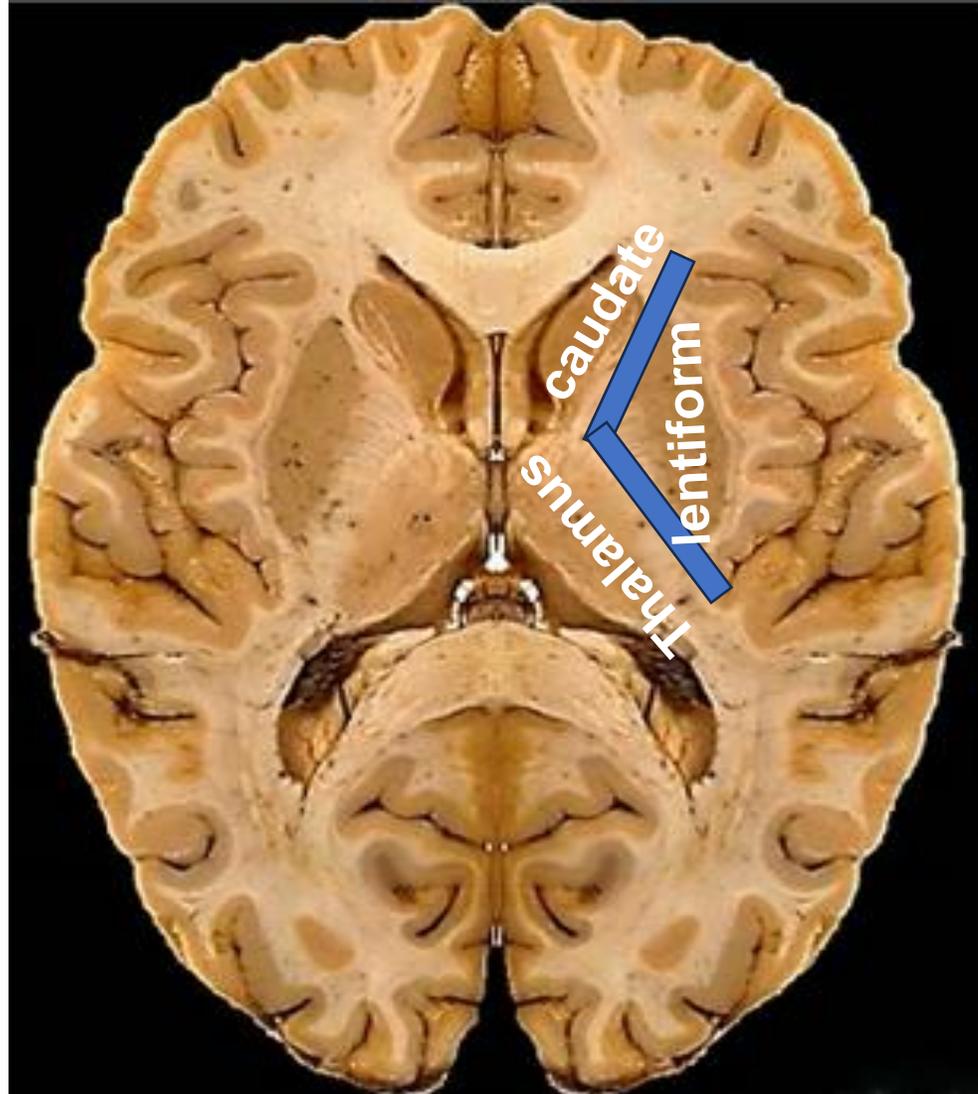
**Inferiorly:** related to the **amygdaloid nucleus** and the **anterior commissure.**



Coronal section

**MCQ : ( Posterior limb - Anterior limb ) of internal capsule separate it from :**





# Clastrum

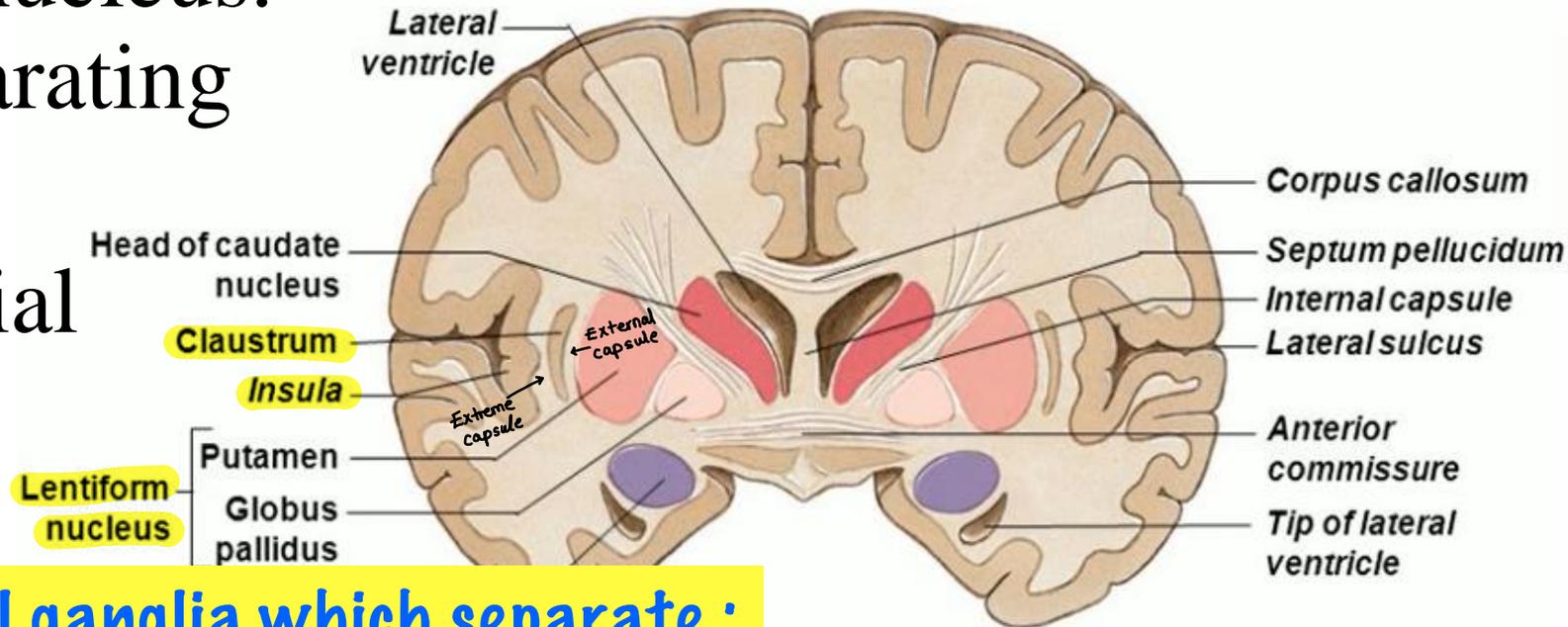
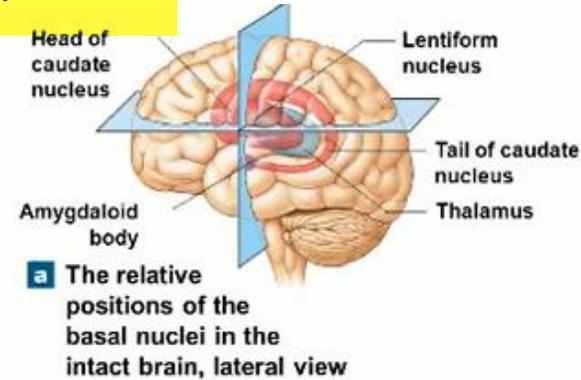
Coronal section

**Relation: deep to the insula**

**External capsule: separating it from the lentiform nucleus.**

**Extreme capsule: separating it from the insula.**

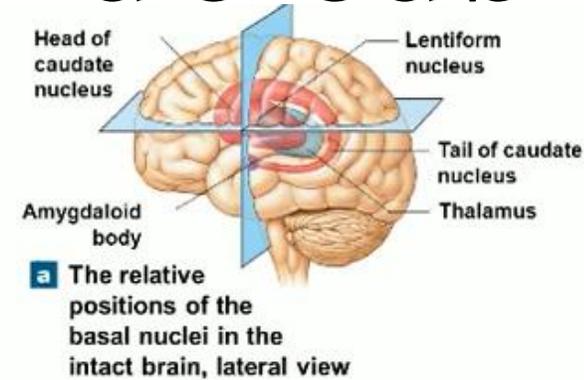
**Function: controversial function**



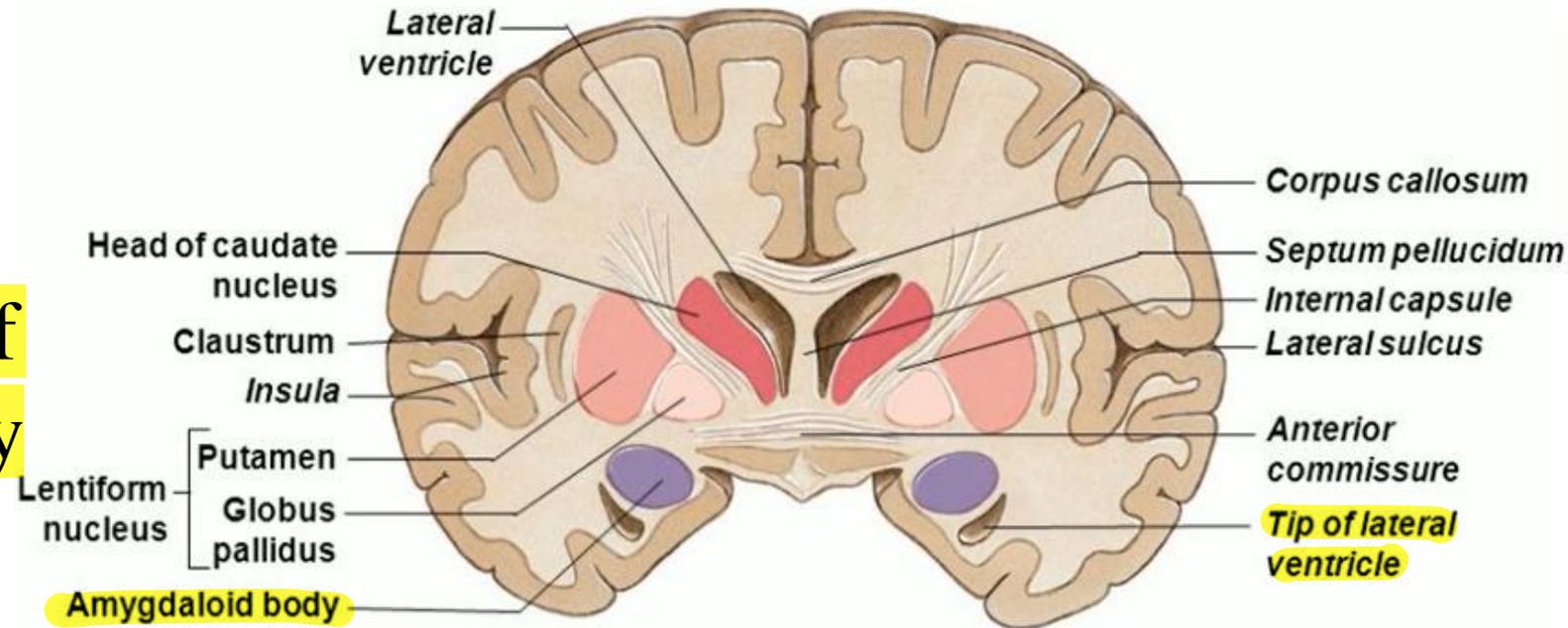
**MCQ : Clastrum is part of basal ganglia which separate : External capsule from Extreme capsule**

# Amygdaloid nucleus

- It lies in the anterior part of the temporal lobe in the roof and in front of the tip of the inferior horn of the lateral ventricle.
- **Function:** It is a part of the limbic and olfactory systems.



Coronal section





# Blood Supply of basal ganglia

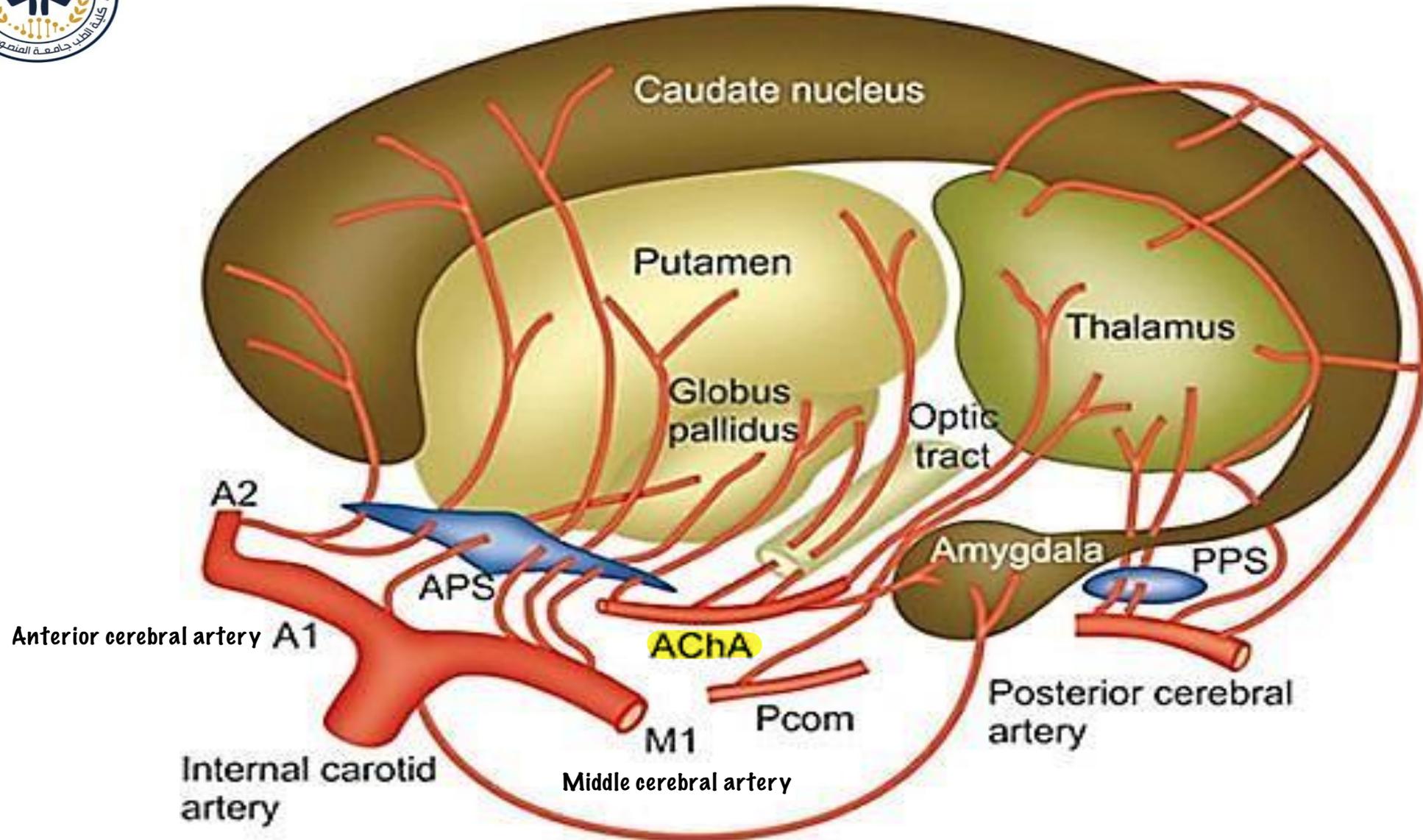


# Arterial supply of the Basal Ganglia

Basal ganglia are supplied by **internal carotid artery (ICA)**

- Anterior part of corpus striatum:** by the **anterior cerebral artery (medial striate artery) from the ICA.**
- Remaining parts of corpus striatum except tail of the caudate nucleus:**
  - by the **middle cerebral artery (lateral striate arteries) from the ICA.**
- Tail of the caudate nucleus & amygdaloid nucleus:** **anterior choroidal artery from the ICA**

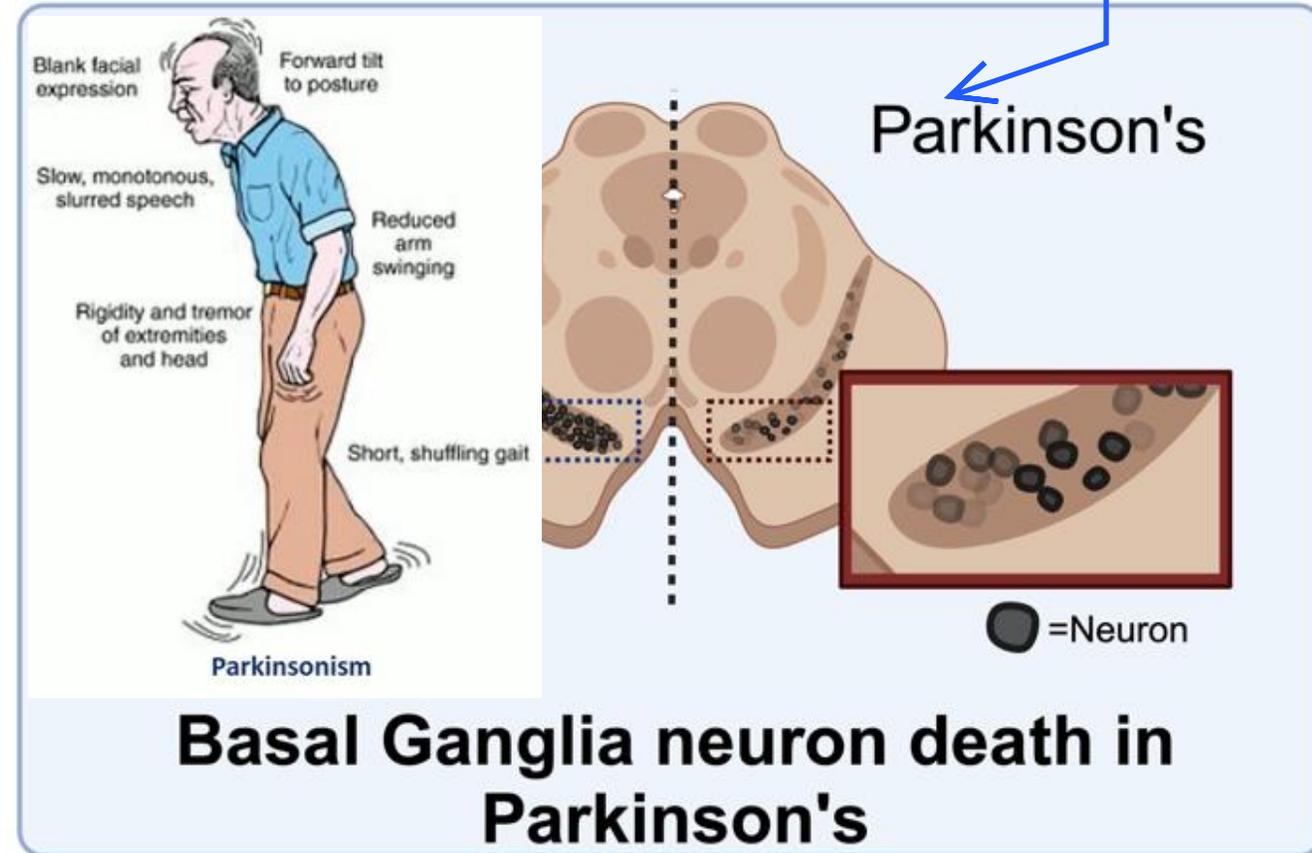
**MCQ شائع : Blood supply of basal ganglia mainly from : internal carotid artery**



# Malfunction of Basal Ganglia

- Damage to the basal ganglia cells may cause problems controlling speech, movement, and posture. This combination of symptoms is called **parkinsonism**. A person with basal ganglia dysfunction may have trouble starting, stopping, or sustaining movement

سببها خلل في الـ dopamine الذي  
جاي من الـ substantia nigra



# Quiz

1. Corpus striatum is supplied by

- a. Vertebral
- b. Basilar
- c. Internal carotid
- d. External carotid
- e. Subclavian

لو ما القيتش internal carotid في الاختيارات دور على عياله اللي هما  
Anterior cerebral أو Posterior cerebral أو anterior chorioidal

Answer: c

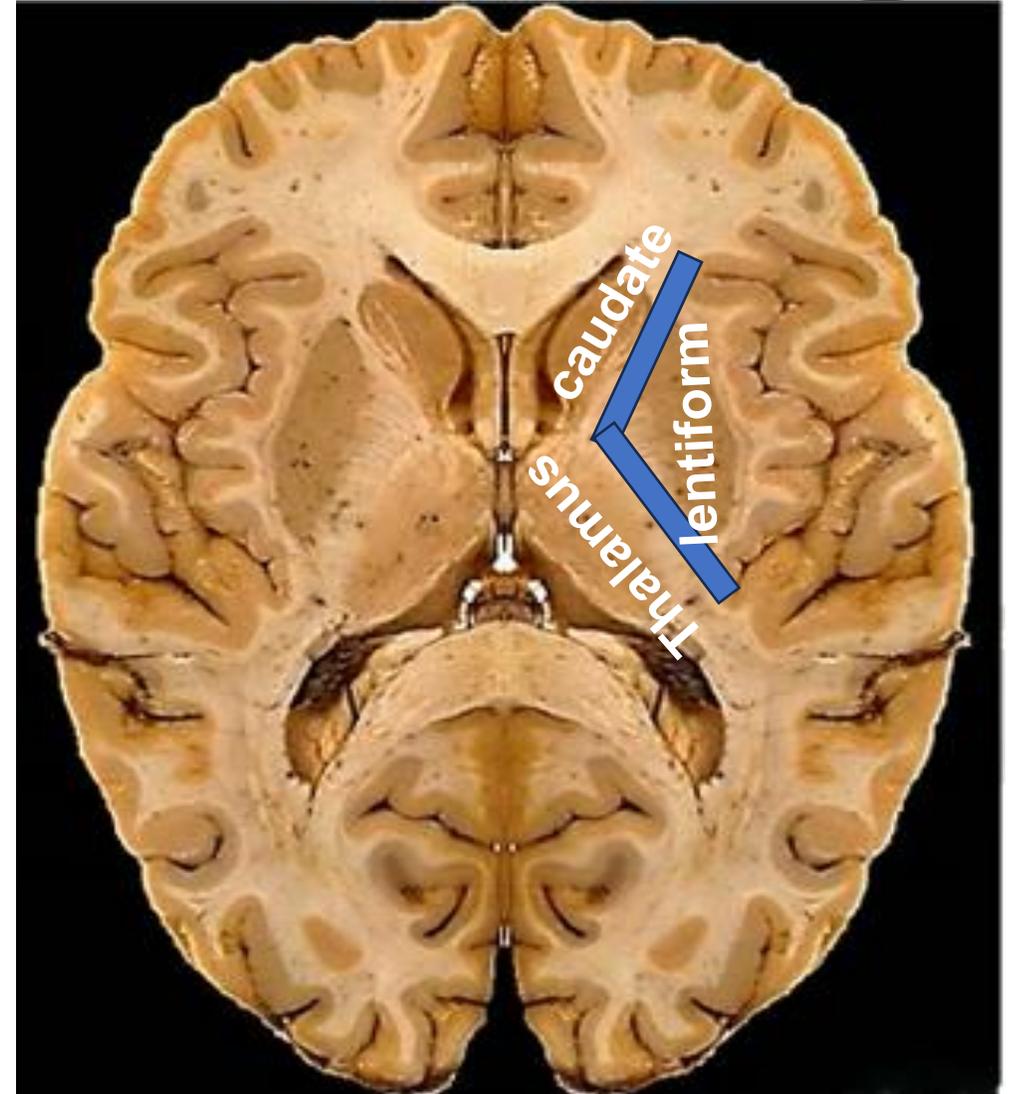


# Anatomy of Internal Capsule

**Definition:** It is a band of **projection** fibers

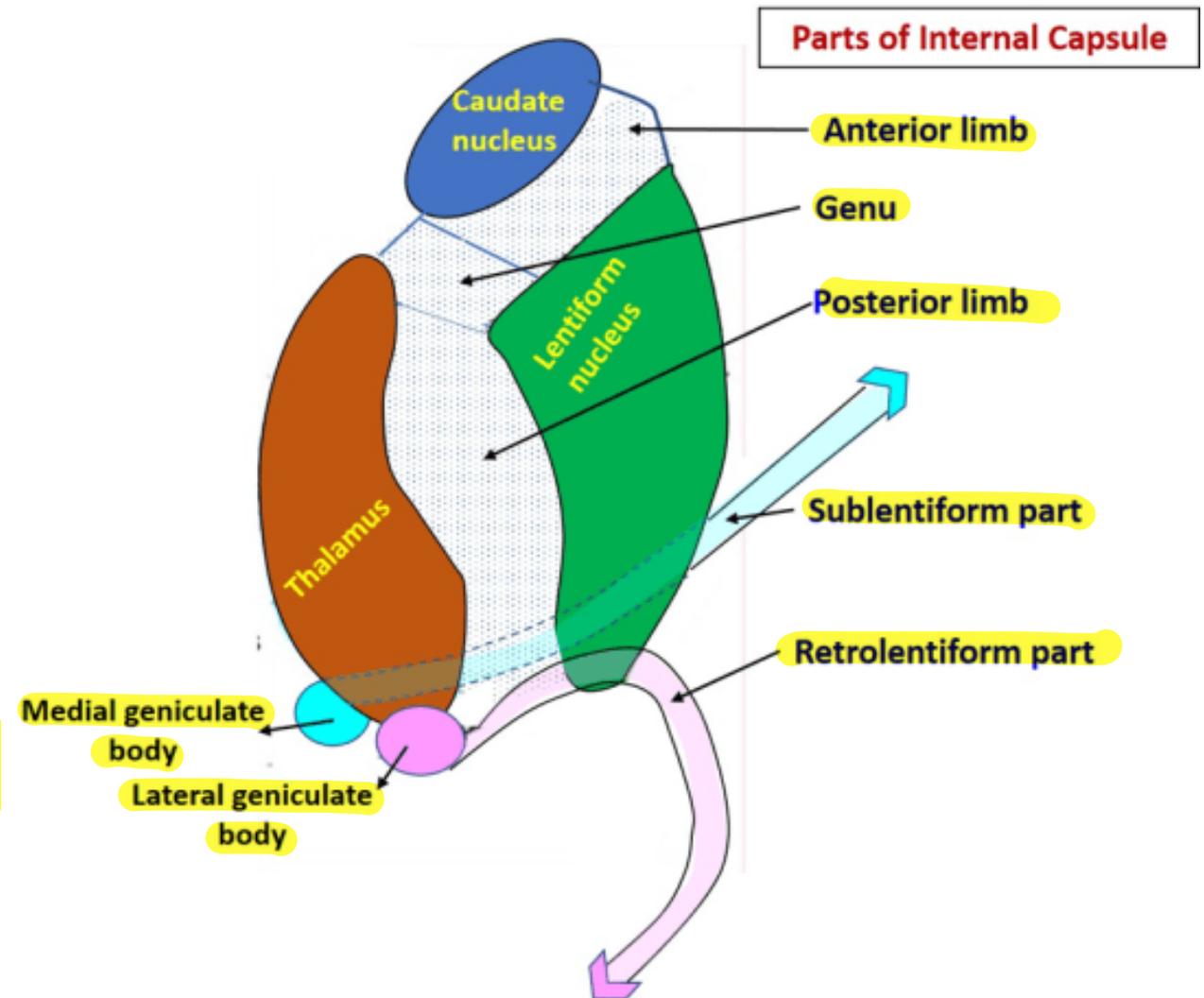
**Divisions:** It is divided into 3 **parts:**

- **Anterior limb:** between the **lentiform** nucleus and the **head** of the **caudate** nucleus.
- **Genu:** opposite the **apex** of the **lentiform** nucleus.
- **Posterior limb:** between the **lentiform** nucleus and the **thalamus**

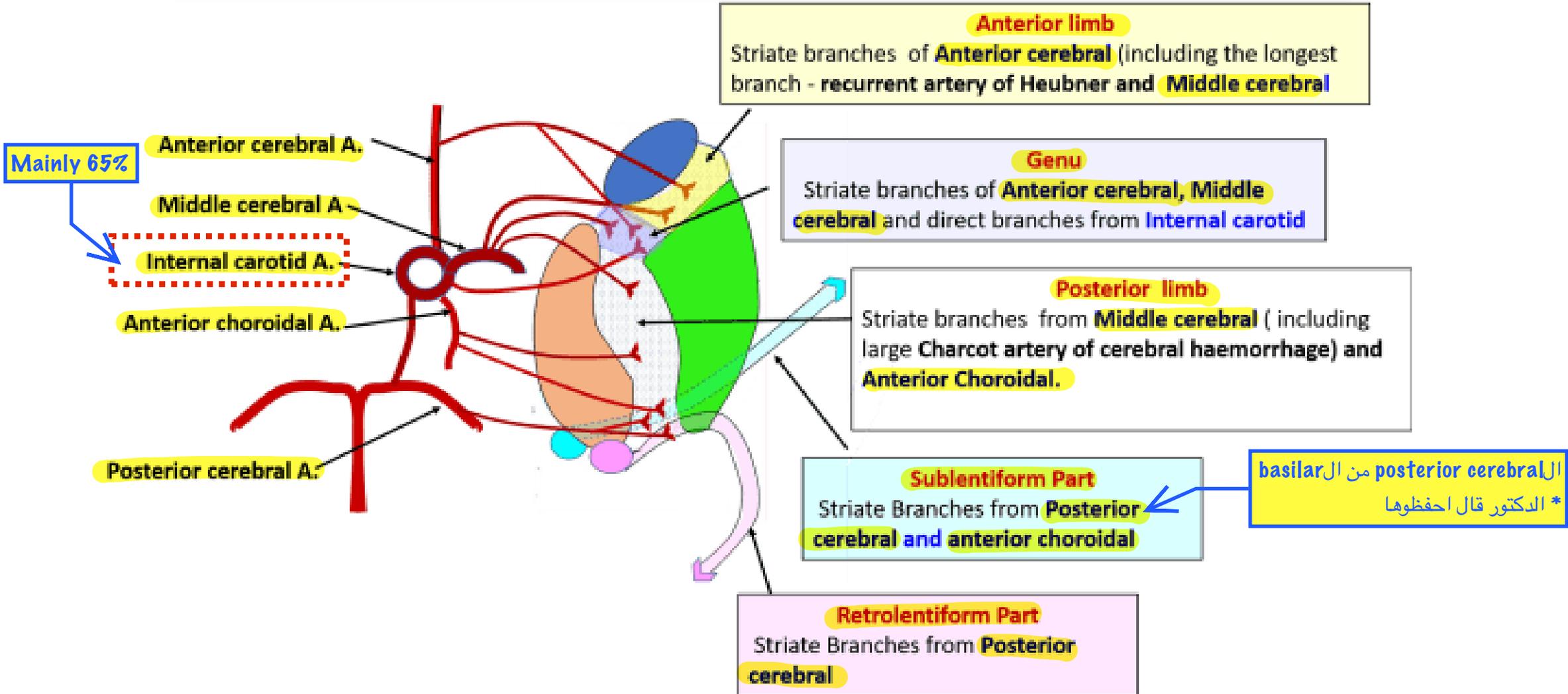


• **Posterior limb: is divided into:**

- A. **Lenticulothalamic part:** between the lentiform nucleus and the thalamus.
- B. **Retolenticular part:** behind the lentiform nucleus.
- C. **Sublenticular part:** below the lentiform nucleus.



# Arterial supply of the internal capsule



# Quiz

**1. Anterior limb of internal capsule lies between the lentiform nucleus and...**

- a. Head of the caudate nucleus.
- b. Body of the caudate nucleus.
- c. Tail of the caudate nucleus.
- d. Thalamus
- e. Claustrum

**Answer: a**

# Quiz

1. Is the main arterial supply of internal capsule
- a. Vertebral
  - b. Basilar
  - c. Internal carotid
  - d. External carotid
  - e. Subclavian

**Answer: c**

# References for further readings

- Oxford Handbook of Clinical Medicine (3rd edition).
- Gray's anatomy for students
- The Clinical Practice Of Neurological and Neurosurgical Nursing Fourth Edition.

