BASAL GANGLIA

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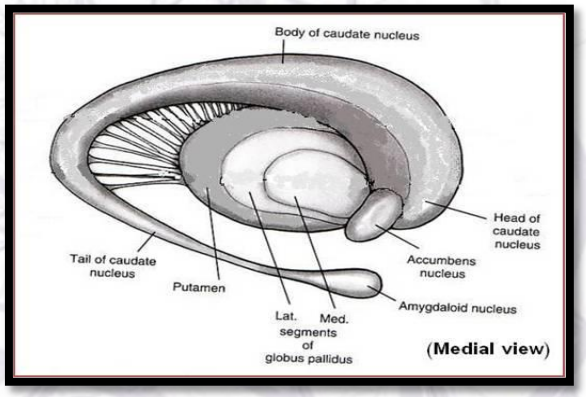
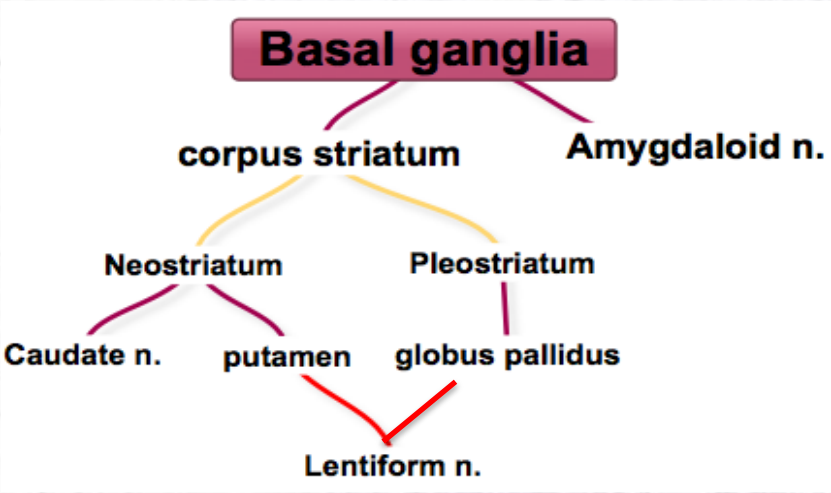
Basal ganglia (nuclei):

Basal ganglia :
Group of nuclei deeply situated in cerebral hemispheres
Caudate Nucleus, Lentiform Nucleus & Amygdaloid Nucleus



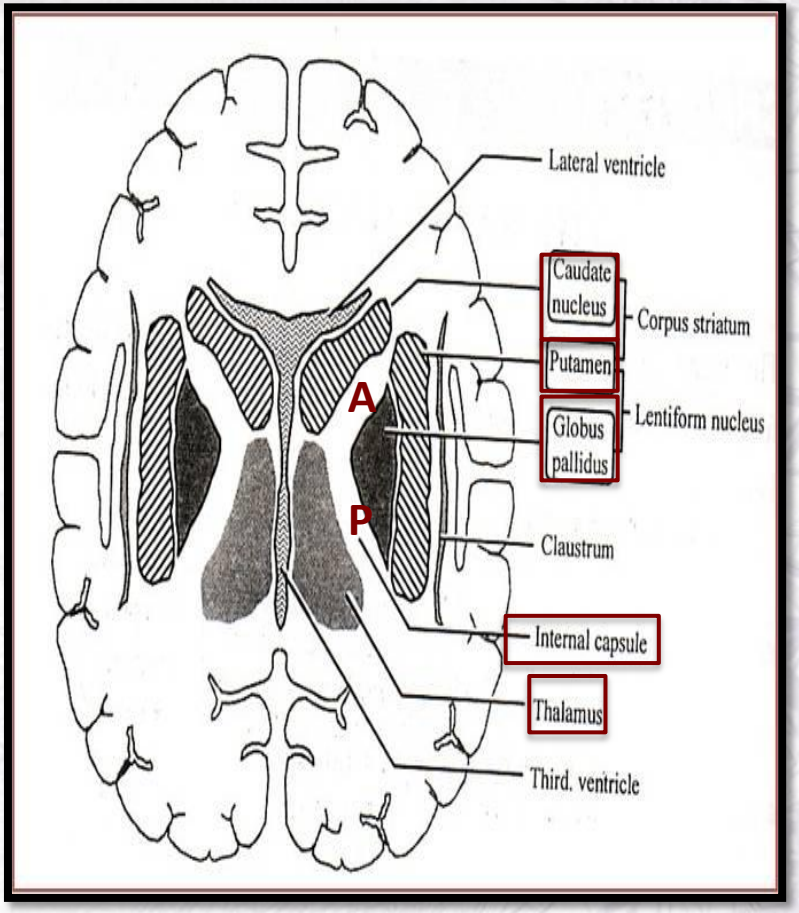


* **corpus striatum** = caudate + lentiform (functional relationship and they are a part of extrapyramidal motor system involved in motor function + control of posture), Bands of grey matter pass from lentiform nucleus across the internal capsule to the caudate nucleus, giving the striated appearance hence, the name corpus striatum.
* **Neostriatum or striatum**= caudate + putamen (regarding development and functional connections).
* **Pleostriatum =** globus pallidus (oldest part)
* **Amygdaloid nuceus** is a part of limbic system and only emberyologically related to corpus striatum.

Important relationship:

Head of caudate:

- Anterior to thalamus.
- Medial to Lentiform & separated from it by anterior limb of internal capsule.**(A)**
- Forms the lateral wall of anterior horn of lateral ventricle.



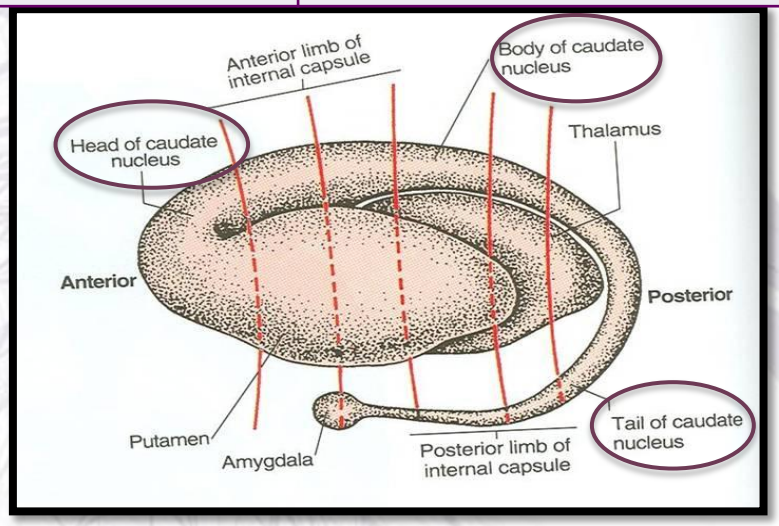
Lentiform nucleus:

- Lateral to thalamus & separated from it by posterior limb of internal capsule.**(P)**

Caudate nucleus:

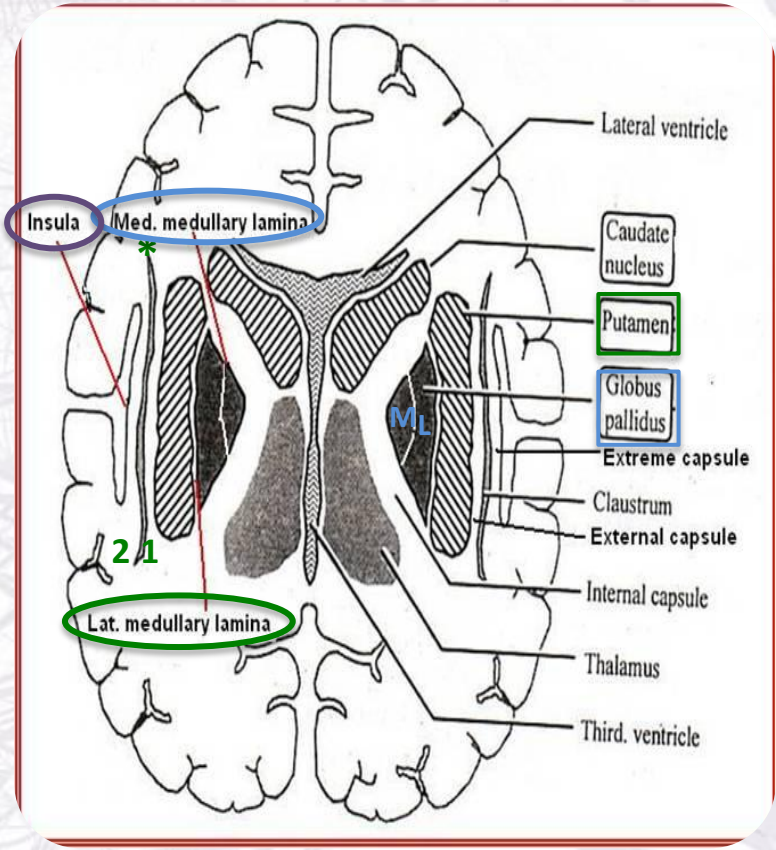
*C shaped mass of gray matter.

Components of Caudate n.			
	Head	**Body**	**Tail**
shape	**Rounded in shape**	**Longandnarrow,**	**Long & tapering,**
Site	**Lies anterior to thalamus (in frontal lobe).**	**Extends above thalamus (in parietal lobe).**	**Descends below thalamus, into temporal lobe.**
	Completely separated from the putamen by the internal capsule except rostrally where it is continuous with the putamen.		**Continuous with Amygdaloid Nucleus.**



Lentiform nucleus:

*Wedge shaped mass of gray mater, its apex lies against the genu of internal capsule.



Division:

1. **Larger darker lateral portion (putamen):**

- separated from GP by lateral medullary lamina
- The white mater that lies lateral to it divided by sheath of gray mater (claustrum*) into :

1.external capsule: between putamen and claustrum.
2.extreme capsule: between claustrum and **insula**.

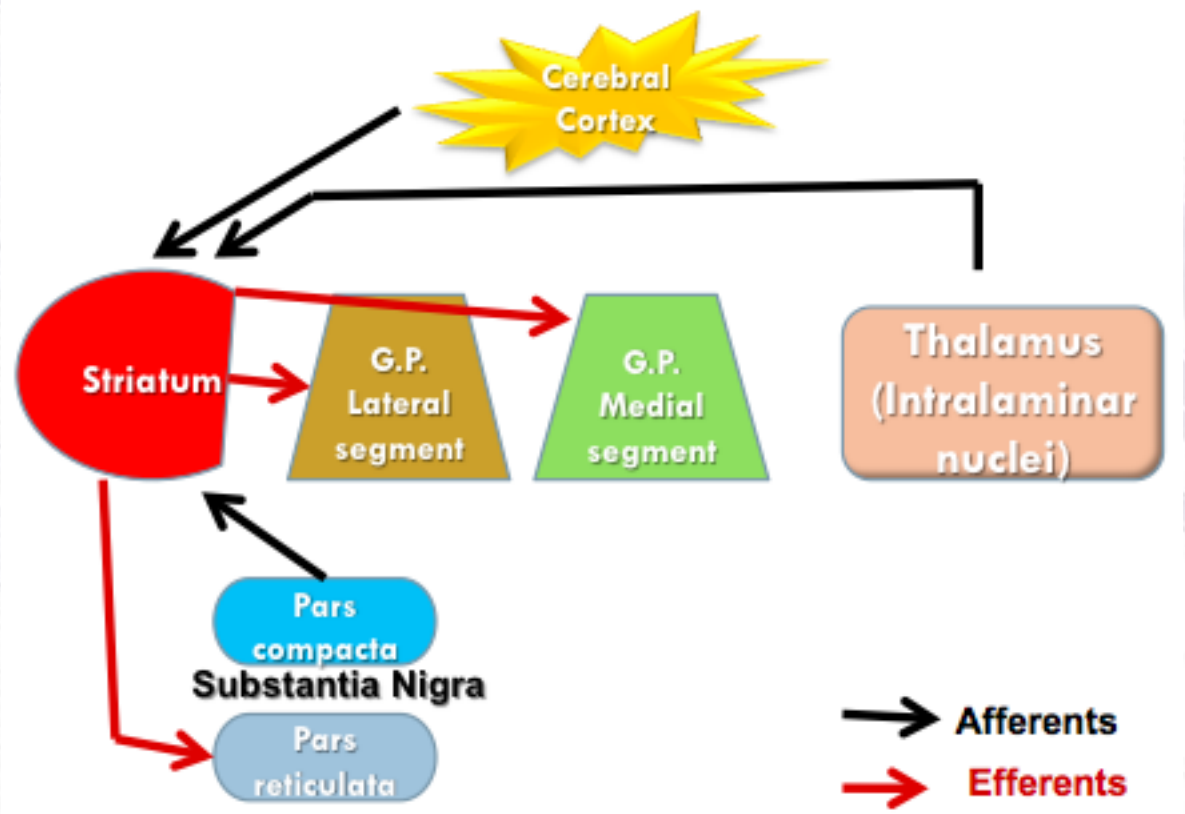
2. **Smaller lighter medial portion (globus pallidus):**

- Consist of two divisions Lateral (external) and Medial (internal) segments divided by medial medullary lamina.
- The medial segment is similar, in terms of cytology and connections with the pars reticulata of substantia nigra.

Connection of the basal ganglia:

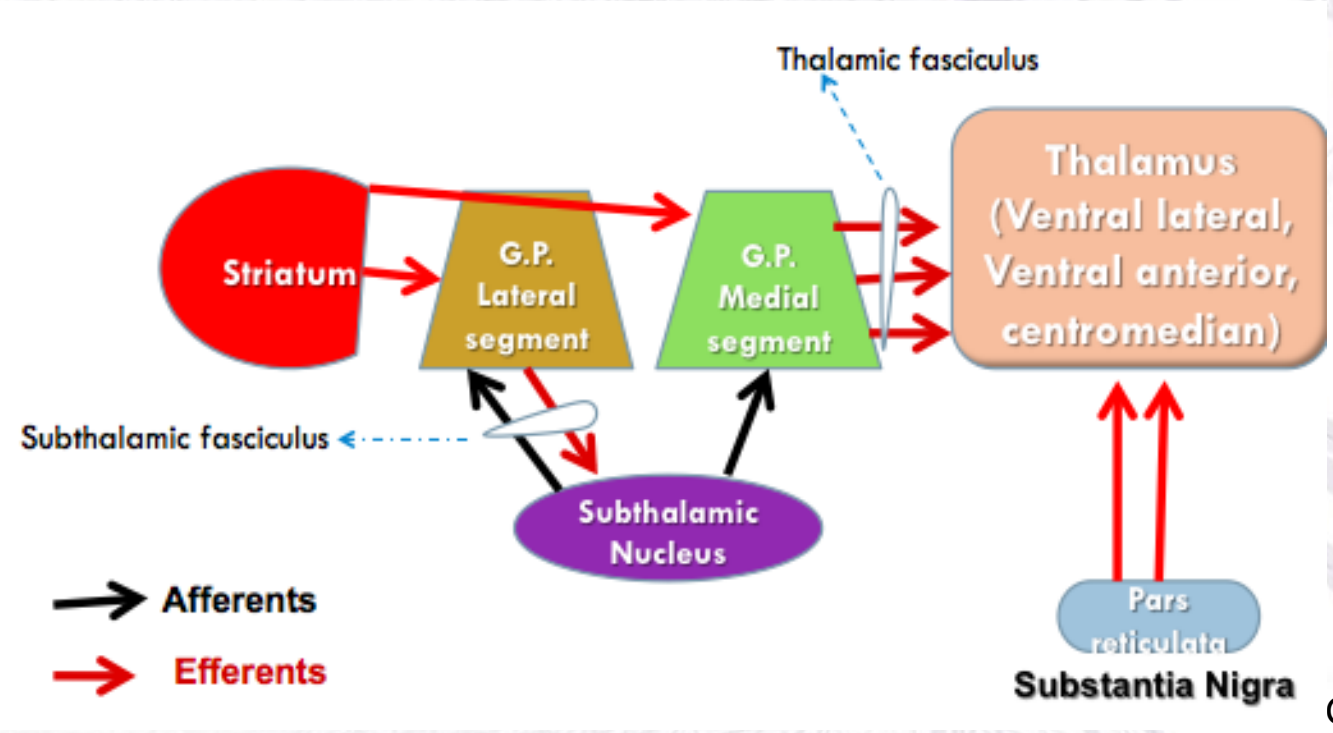
Input region (striatum):-

- **Afferent**: come from: cerebral cortex, intralaminar nucleus of thalamus and pars compacta of substantia nigra.
- **Efferent**: directed to globus pallidus & pars reticulata of substantia nigra.



Output regions are (medial GP and pars reticulata of substentia nigra)

- Afferent of both lateral and medial GP : comes from subthalamic nucleus and striatum.
- Efferent of lateral GP: directed to subthalamic nucleus.
- Efferent of medial GP: directed to ventral lateral, ventral anterior and centromedian nucleus of thalamus.



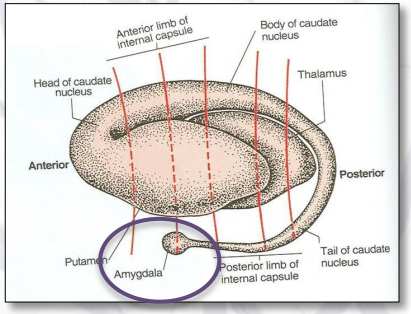
Notes:

Subthalamic fasciculus = fibers from subthalamic nucleus to the GP.

Thalamic fasciculus = fibers from medial GP to the thlamus .

Amygdaloid nucleus

- Site: It lies in the temporal lobe, related to tail of caudate nucleus.
- Function: it is the part of **limbic system** concerned with **emotional and behavioral functions**. It is responsible for strong affective reactions as **fear & anger** and emotions associated with **sexual behavior**.
- **Lesion**: lack of emotional responses, docility



Corpus striatum (function and dysfunction)

- The corpus striatum assists in **regulation of voluntary movement and learning of motor skills**.
- Their function is to facilitate behavior and movement that are required and appropriate, and inhibit unwanted or inappropriate movement.

* Its dysfunction does not cause paralysis, sensory loss or ataxia.
* Its dysfunction leads to: 1- Abnormal motor control: dyskinasia
  2- alteration in muscle tone: hypertonia and hypotonia

Questions:

The lentiform is separated from caudate by :
A- Anterior limb of internal capsule
B- Posterior limb of internal capsule
C- lateral medullary lamina
D- Medial medullary lamina

2-Which of the following called pleostriatum ?
A-caudate
B-putamen
C-globus pallidus
D-amygdala

3-the lentiform located ……. To thalamus ?
A-medial
B-lateral
C-anterior
D-posterior

4-putamen Separated from globus pallidus by a thin sheath of nerve fibers called :
A-lateral medullary lamina
B-medial medullary lamina
C-anterior medullary lamina

5- Which part of CAUDATE NUCLEUS continue with Amygdaloid Nucleus
A- Head
B- Body
C- Tail
D- B and C

1-a 2-c 3-b 4-a 5-c 6-b 7-a 8-b 9-b 10-a

6-Body of caudate located in the
A- Frontal lobe
B- parietal lobe
C- Temporal lobe
D- Occipital lobe

7-the - Extreme capsule between:
A- claustrum and insula
B- claustrum and putamen
C- claustrum and globus pallidus
D- globus pallidus and putamen

8-STRIATUM is formed of :
A- Caudate and Thalamus
B- Putmen and caudate
C- Caudate and globus pallidus
D- Putmen and globus pallidus

9- amygdale located in which lobe of brain ?
A-frontal
B-temporal
c-parietal
D-occipital

10-lesion of amygdale lead to :
A-lack of emotional responses
B- lack of sensation
C-lack of motor activity
D-paralysis