

Diencephalon

Diencephalon

- Part of brain between the cerebrum & brainstem (midbrain).
- Cavity within it - **third ventricle**
- Communicates on either side with the lateral ventricle of the cerebral hemisphere.
- **Subdivisions: by shallow groove, the hypothalamic sulcus**
 - Pars dorsalis
 - Pars ventralis

Diencephalon

- **Pars dorsalis** consists of:
 - **Thalamus**
 - **Metathalamus:** include medial & lateral geniculate body
 - **Epithalamus:** consists of pineal gland, habenular nuclei & commissure, posterior commissure & stria medullaris thalami
- **Pars ventralis** consists of:
 - **Subthalamus**
 - **Hypothalamus**

Divisions	Subdivisions
Pars dorsalis	
<ul style="list-style-type: none">• Thalamus (dorsal thalamus)	
<ul style="list-style-type: none">• Metathalamus	Medial and lateral geniculate bodies
<ul style="list-style-type: none">• Epithalamus	Pineal gland, habenular nuclei and commissure, and posterior commissure
Pars ventralis	
<ul style="list-style-type: none">• Subthalamus (ventral thalamus)	Subthalamic nucleus and zona inserta
<ul style="list-style-type: none">• Hypothalamus	

Thalamus

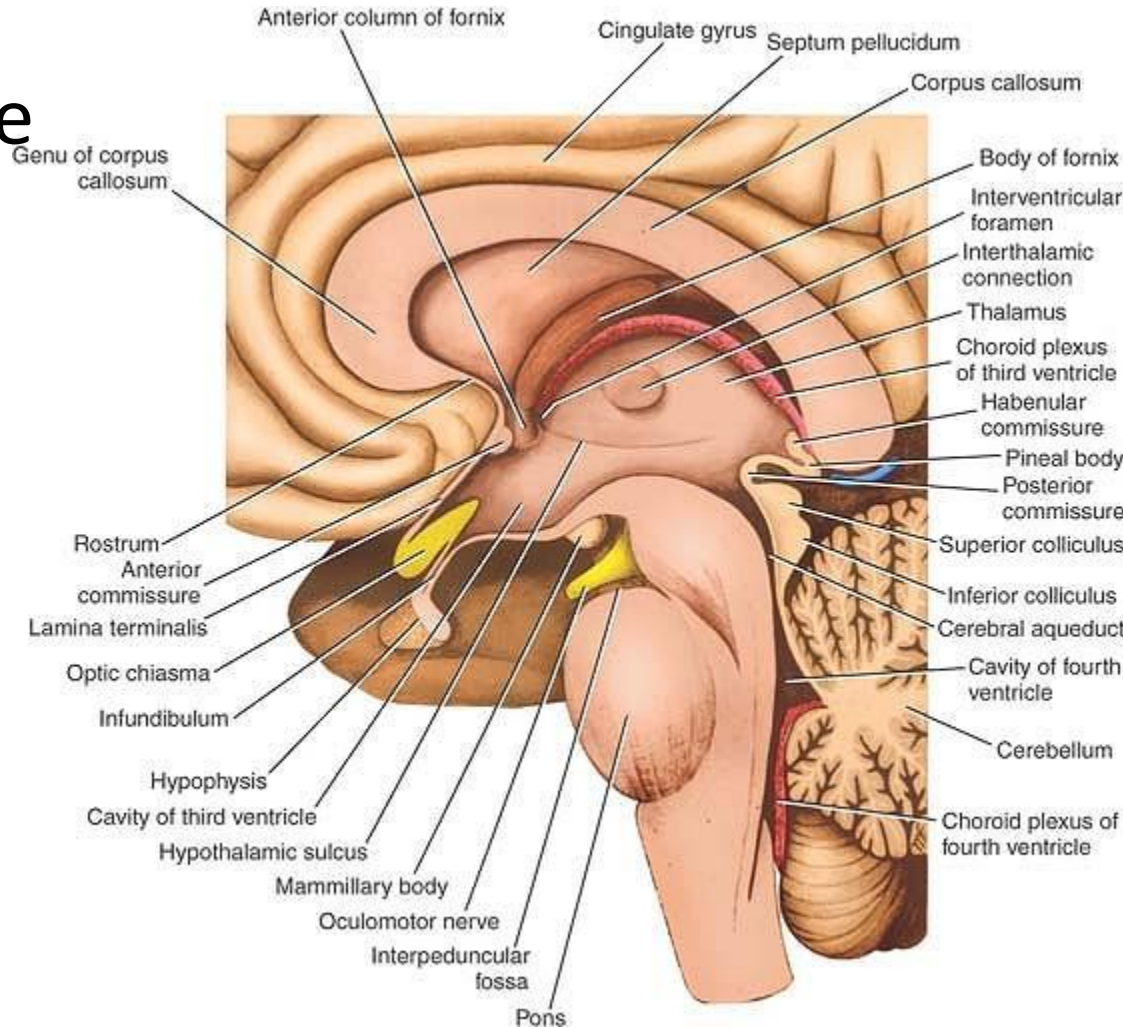
- Large ovoid mass of gray matter lying above the midbrain.
- Situation: on each side of third ventricle
- The thalami are connected to each other by interthalamic connection(adhesion)

External features of thalamus

- Two ends: anterior & posterior
- Four surfaces: superior, inferior, medial & lateral
- **Ends :**
 - Anterior end - narrow & rounded
 - Posterior end - expanded to form pulvinar

Superior surface

- lateral part forms the floor of the central part of the lateral ventricle
- Its medial part is covered by the tela choroidea of the 3rd ventricle.



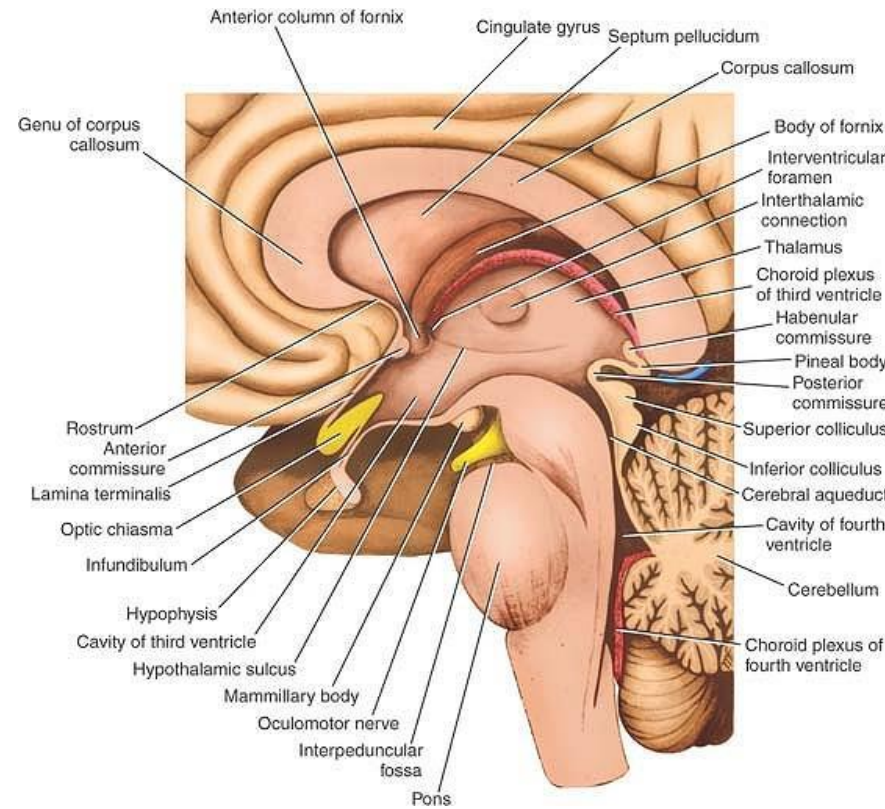
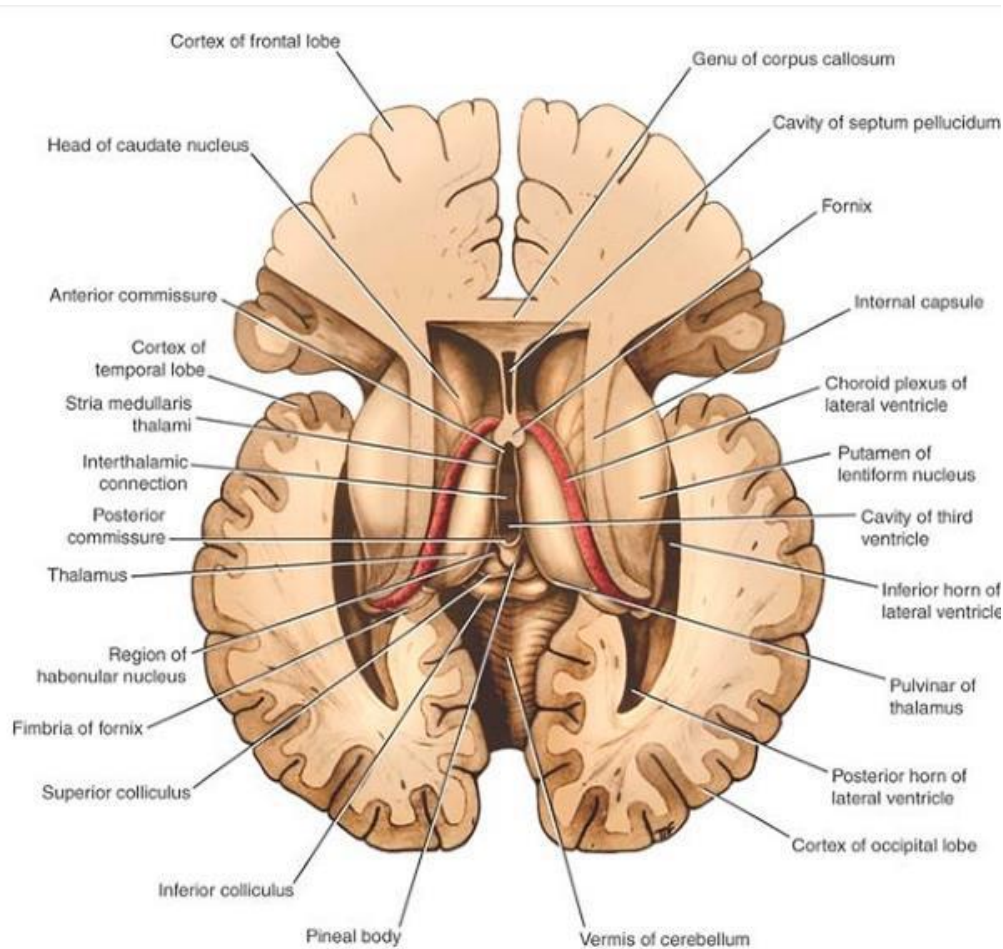
Inferior surface

- Anterior part is fused with the subthalamus
- Posterior part is free, forming the inferior aspect of the pulvinar.



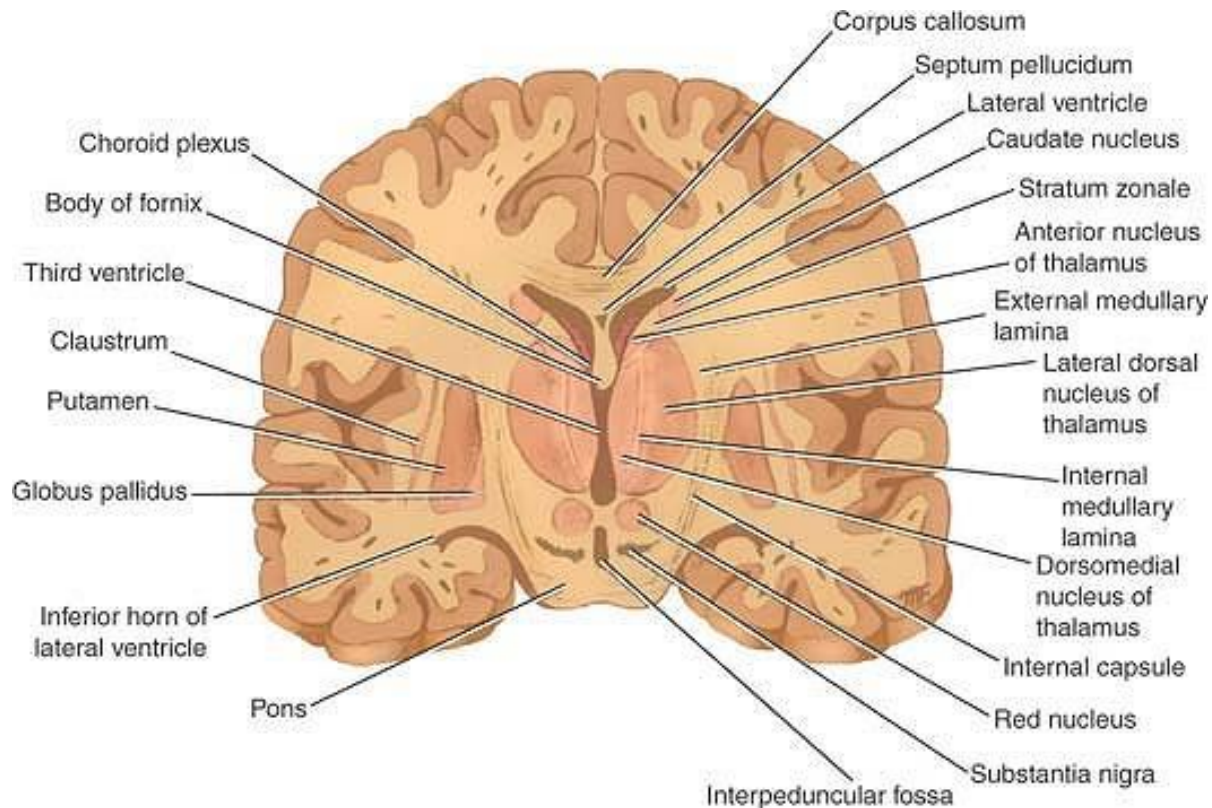
Medial surface

- Forms the greater part of the lateral wall of the 3rd ventricle.



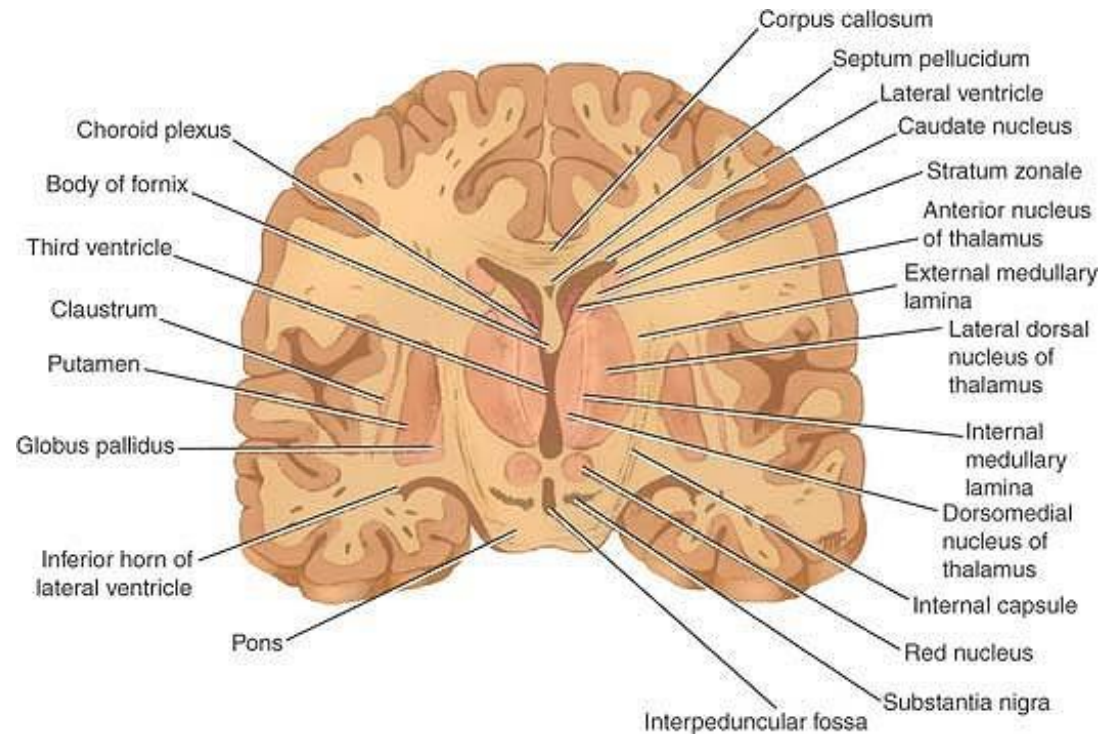
Lateral surface

- Forms the medial boundary of the posterior limb of the internal capsule.



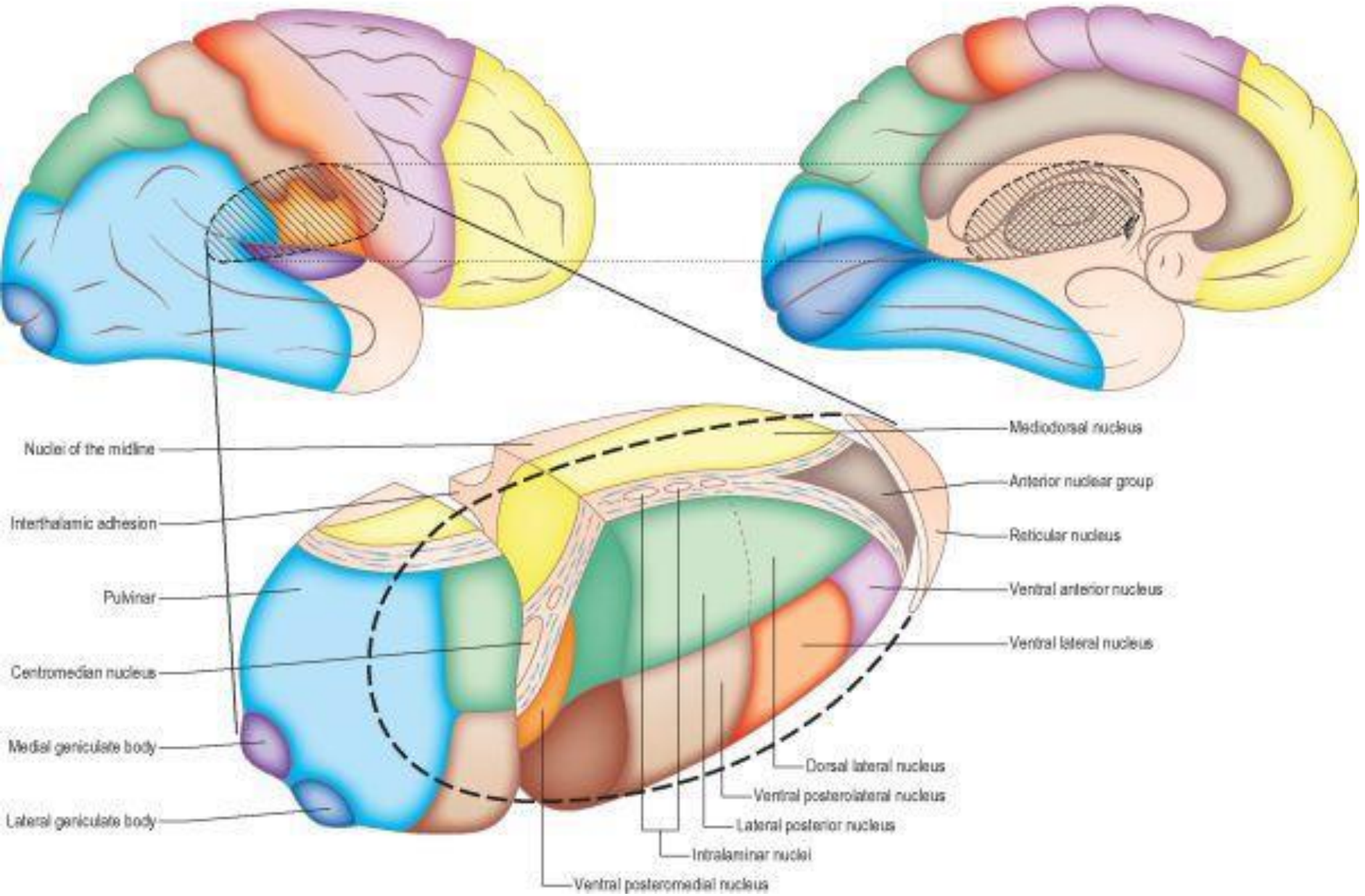
Internal structure of thalamus

- The thalamus consists of mainly gray matter & only a small amount of white matter
- **White matter:**
 - External medullary lamina
 - Stratum zonale
 - Y shaped - Internal medullary lamina



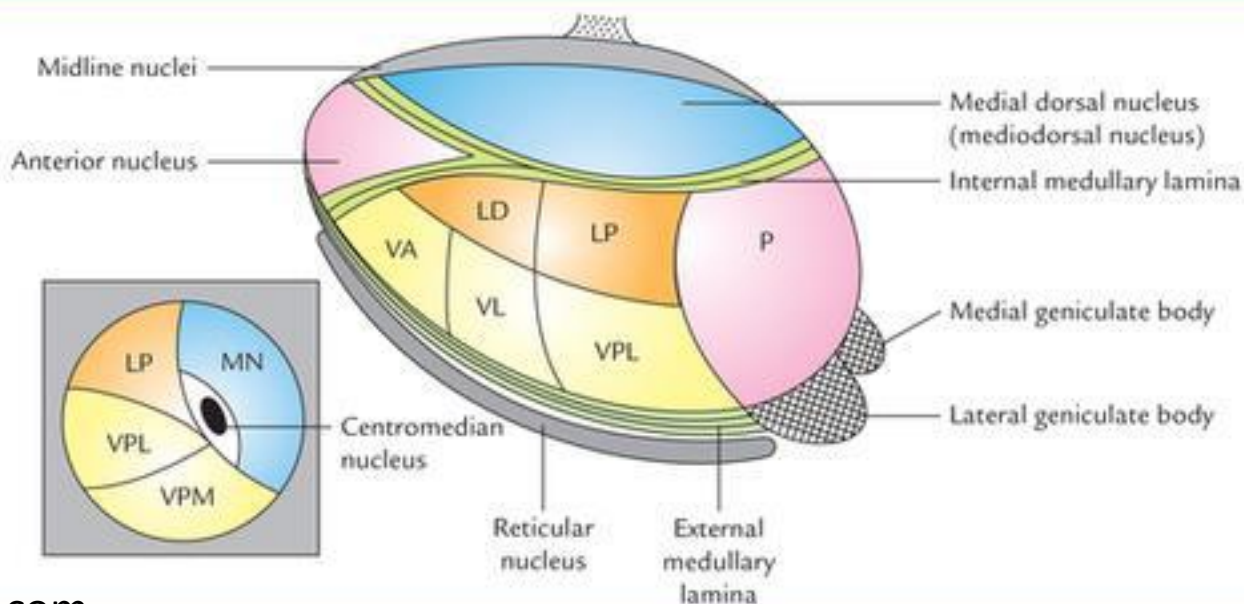
SUPEROLATERAL SURFACE OF HEMISPHERE

MEDIAL SURFACE OF HEMISPHERE

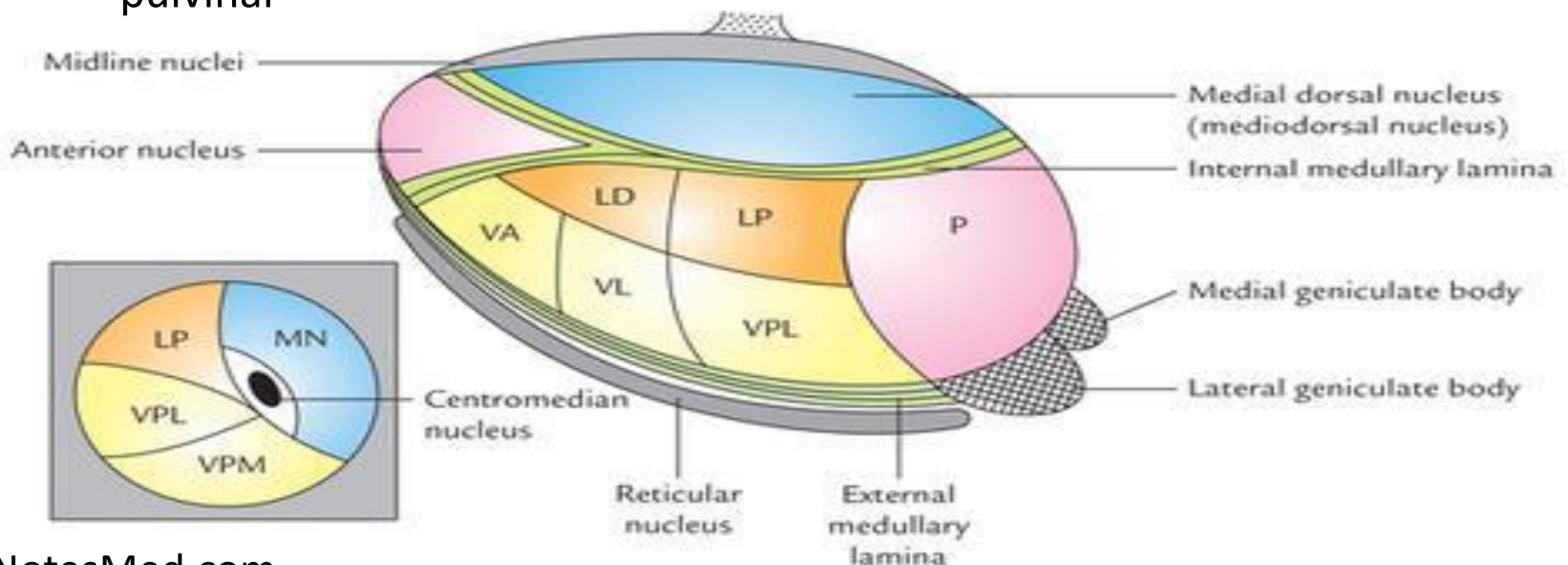


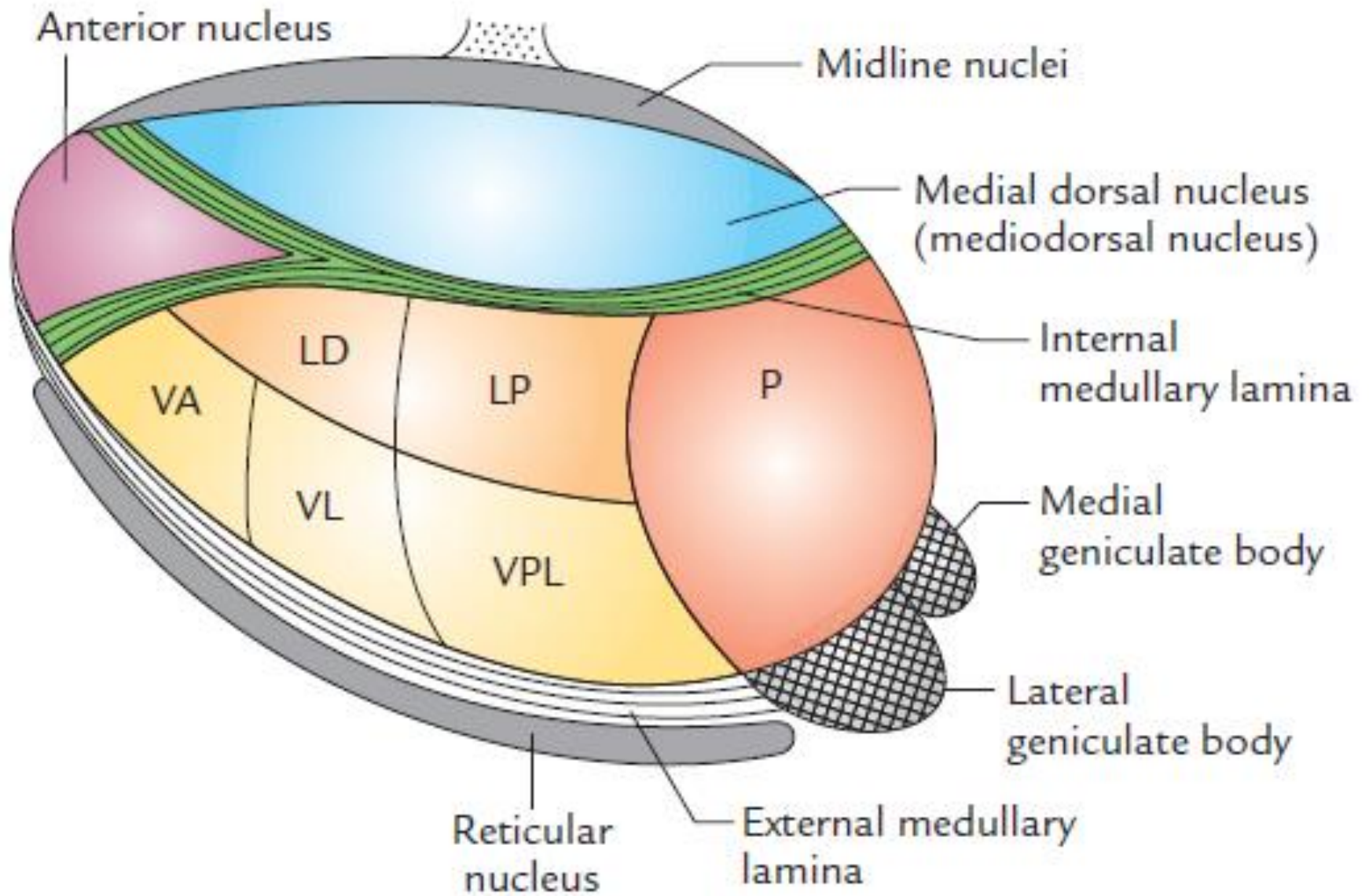
- **Gray matter:**

- consists of nuclei
- Divides into three parts: **anterior, medial & lateral** by **Y – shaped white matter** i.e. **internal medullary lamina**

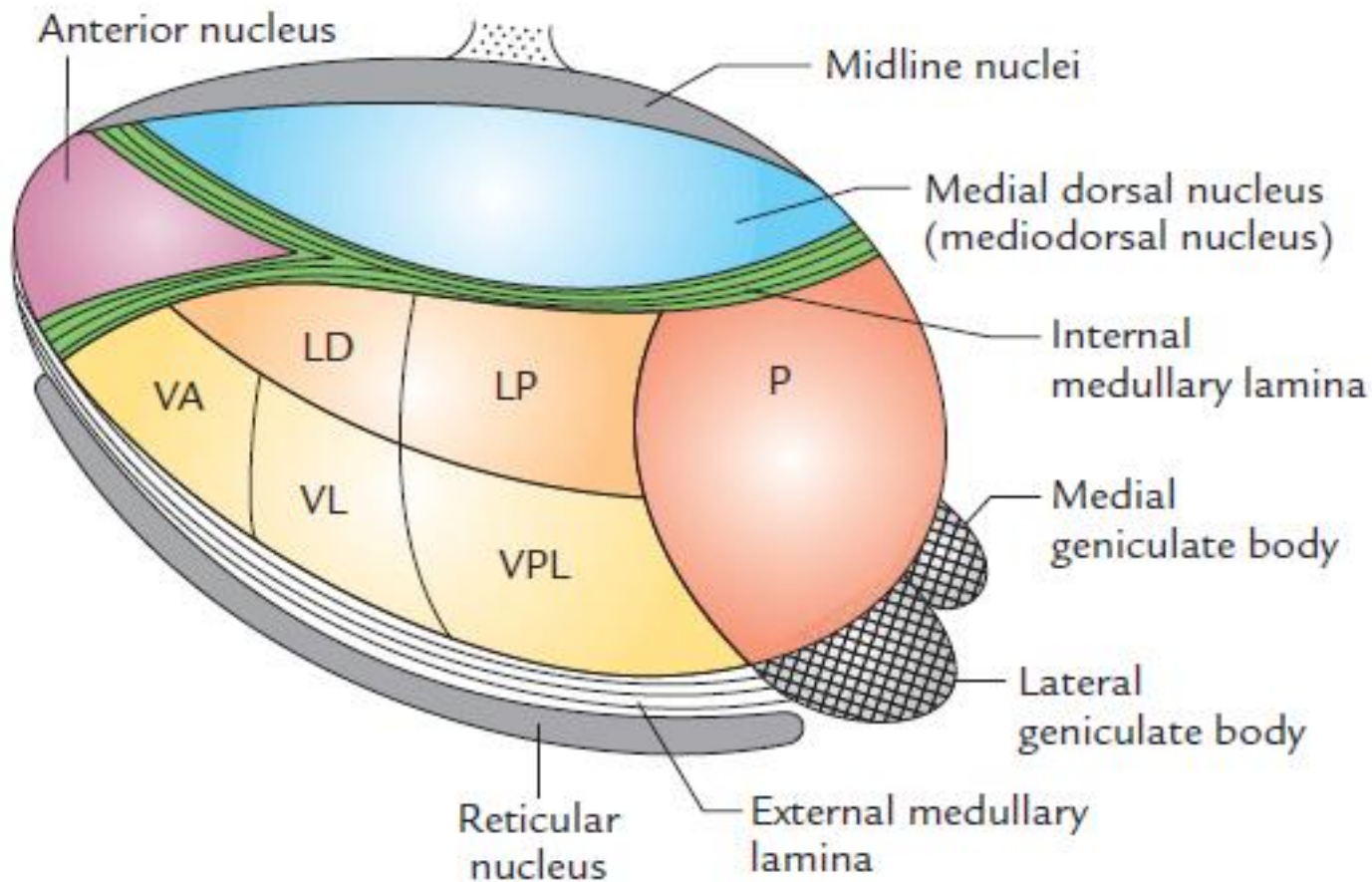


- **Nuclei in the anterior part:** anterior nuclei
- **Nuclei in the medial part:** large dorsomedial nucleus & several smaller nuclei
- **Nuclei in the lateral part:** subdivided into a dorsal tier & a ventral tier
 - Dorsal tier of the nuclei:
 - Lateral dorsal nucleus
 - Lateral posterior nucleus
 - pulvinar

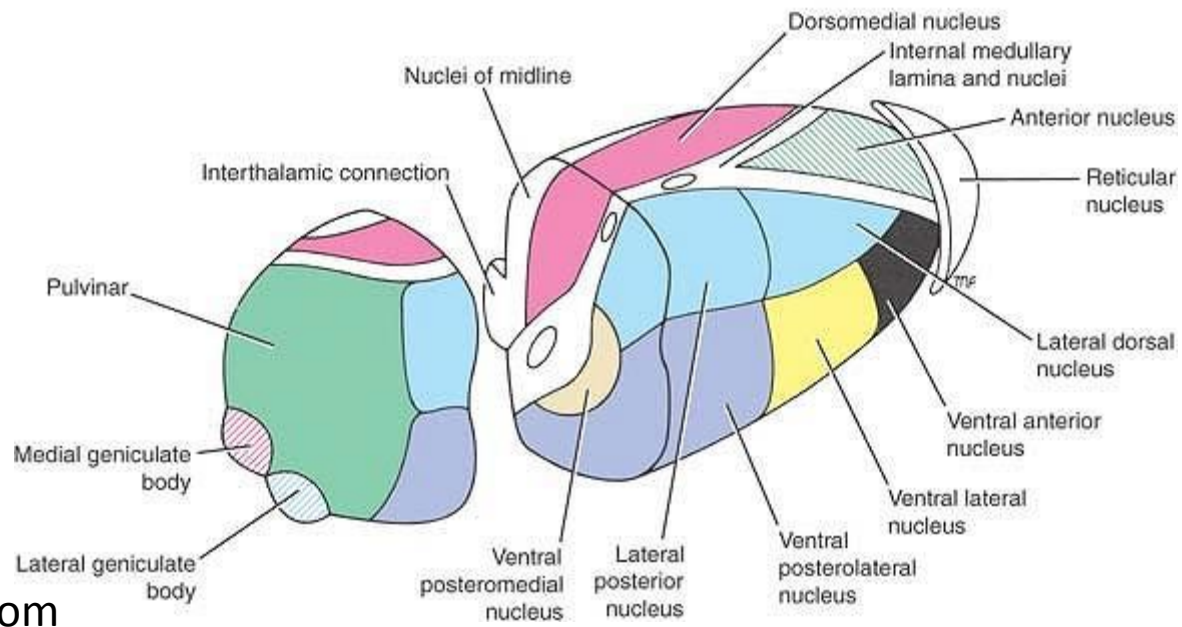
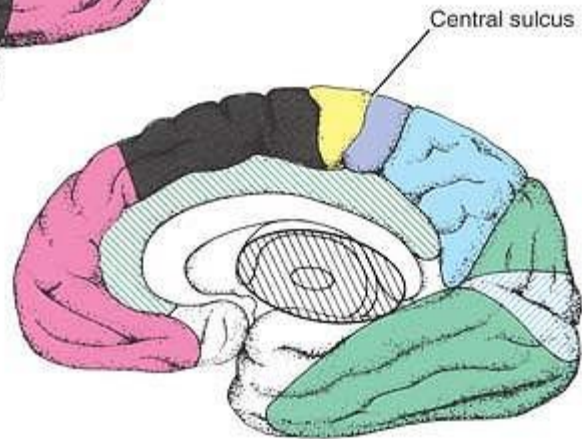
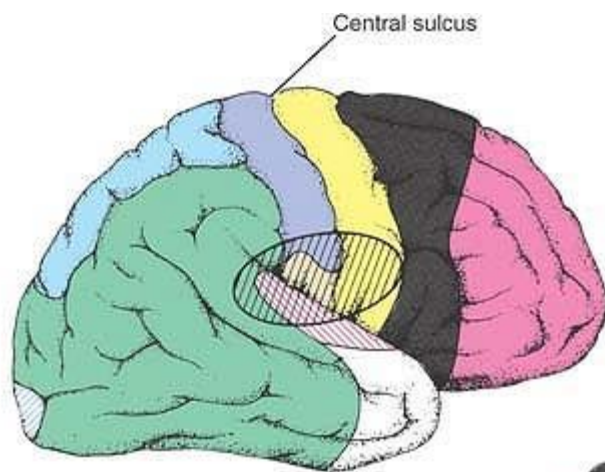




- Ventral tier of the nuclei
 - Ventral anterior nucleus
 - Ventral lateral nucleus
 - Ventral posterior nucleus
 - Ventral posterolateral nucleus
 - Ventral posteromedial nucleus



Part	Nuclei
Anterior part	Anterior nucleus
Medial part	Medial dorsal nucleus, medial ventral nucleus
Lateral part	
• Dorsal tier nuclei	Lateral dorsal, lateral posterior, pulvinar
• Ventral tier nuclei	Ventral anterior (VA), ventral lateral (VL), ventral posterior: (a) ventral posterolateral (VPL), (b) ventral posteromedial (VPM)



- Other thalamic nuclei are:-
 - Intralaminar nuclei
 - Midline nuclei
 - Reticular nuclei
 - Medial & Lateral geniculate bodies

Applied aspects

- **Thalamic syndrome:**
 - Usually occurs subsequent to a vascular lesion of the thalamus.

Metathalamus

- Consists of the medial & lateral geniculate bodies.
- Relay stations for the auditory & visual pathways respectively



Epithalamus

- **Pineal Gland (Epiphysis Cerebri):**
 - a midline cone-shaped reddish grey structure.
 - Occupying the vertical groove between the two superior colliculi below the splenium of corpus callosum.
 - Projects back from the posterior wall of the 3rd ventricle, below the splenium of the corpus callosum.
 - Divides into two laminae