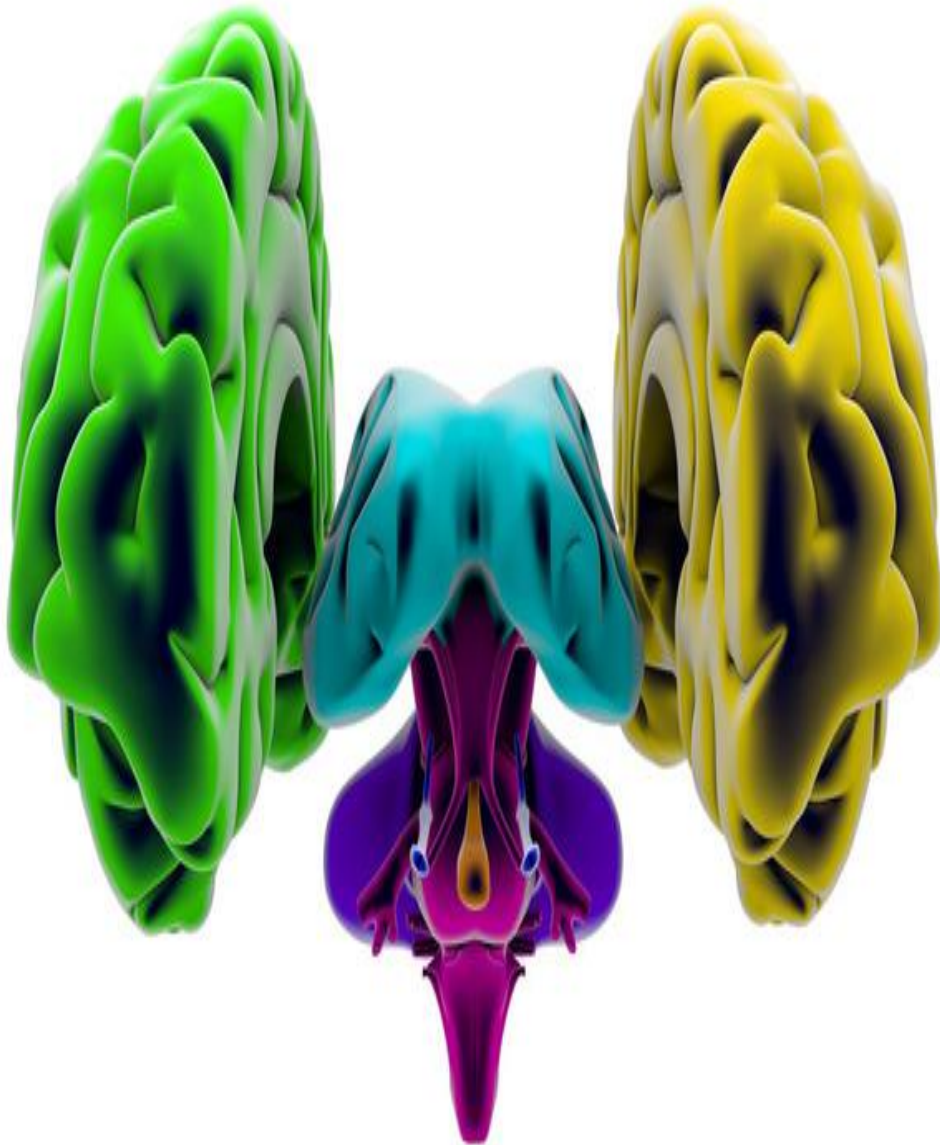


DIENCEPHALON 1

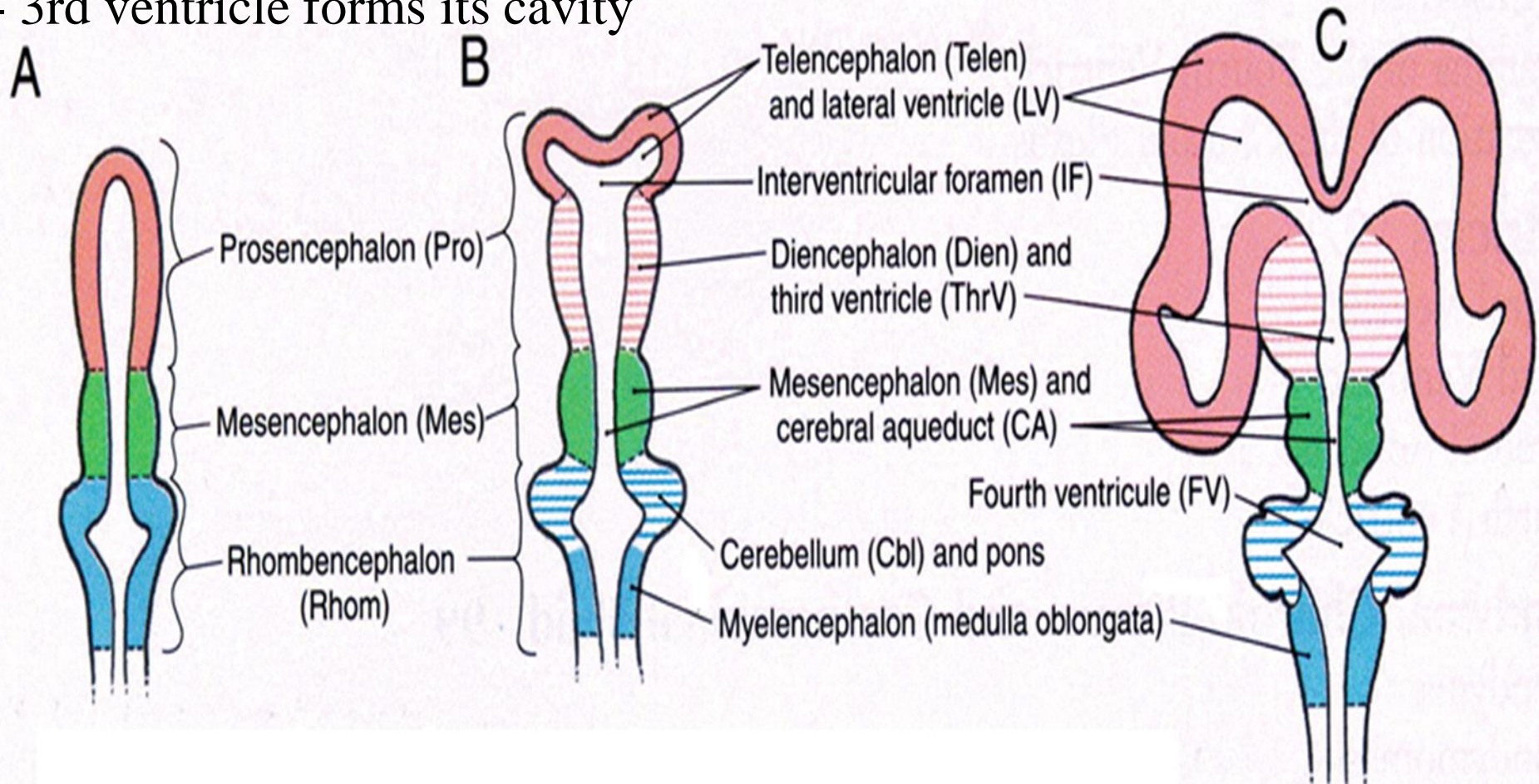


BY
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MUTAH UNIVERSITY

DIENCEPHALON

Def:-

- small part of the forebrain embedded in the lower part of the medial aspect of cerebral hemisphere above midbrain
- 3rd ventricle forms its cavity



DIENCEPHALON

Parts:-

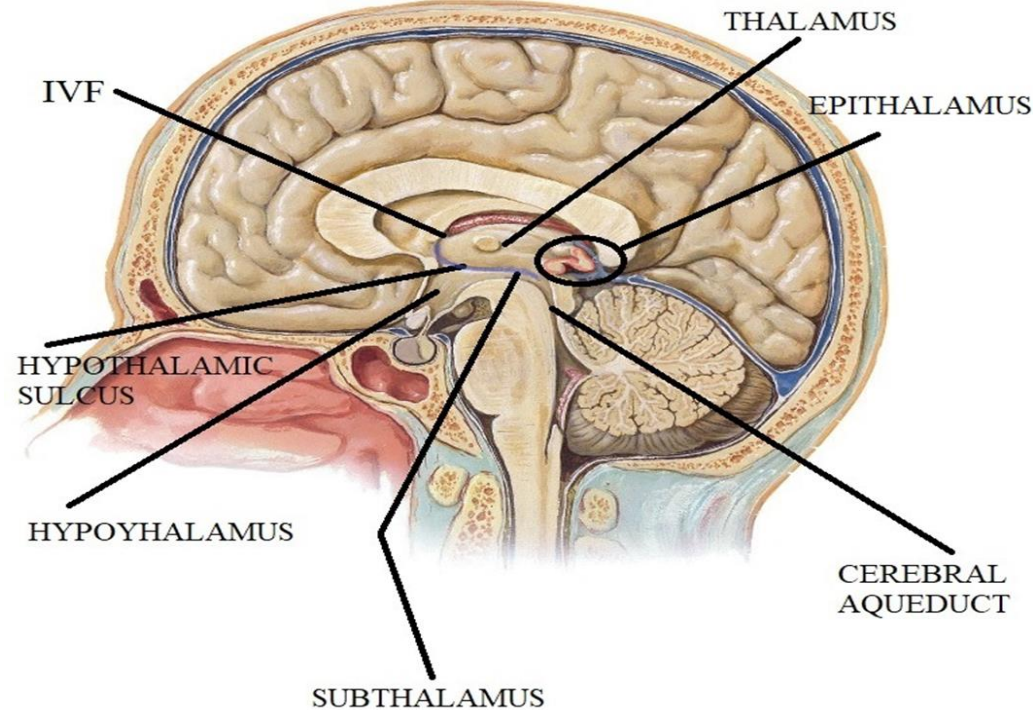
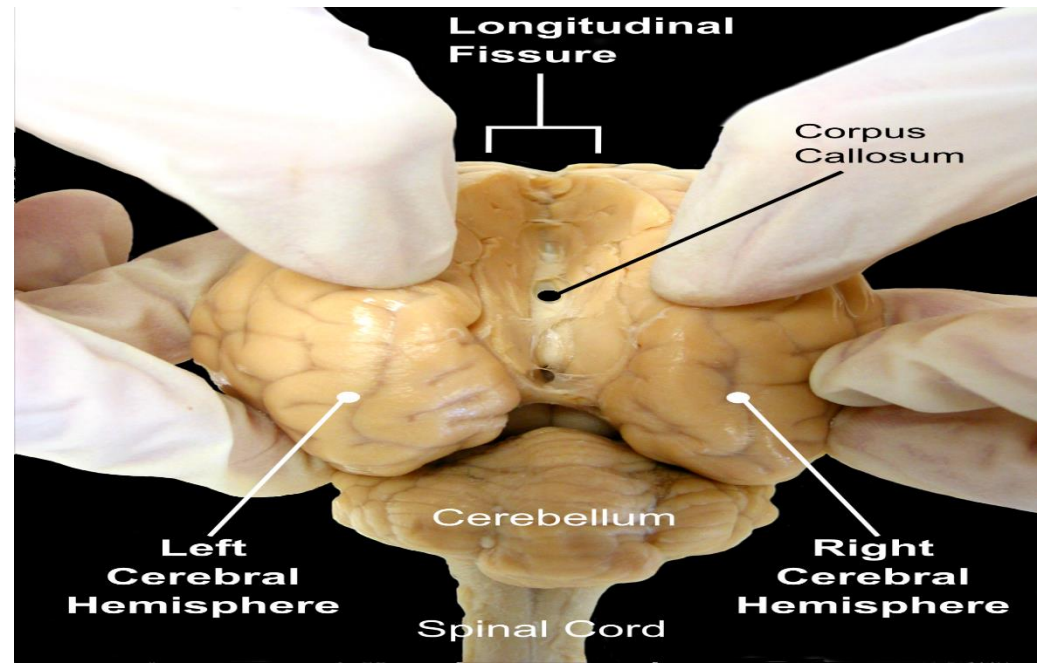
divided by hypothalamic sulcus that extends from interventricular foramen to cerebral aqueduct into

Dorsal part

- a- Thalamus
- b- Epithalamus
- c- Metathalamus

Ventral part

- d- Hypothalamus
- e- Subthalamus



THALAMUS

Shape:

Large oval mass with

2 Ends

ant. end:

narrow and so called
ant. tubercle.

It lies close to midline

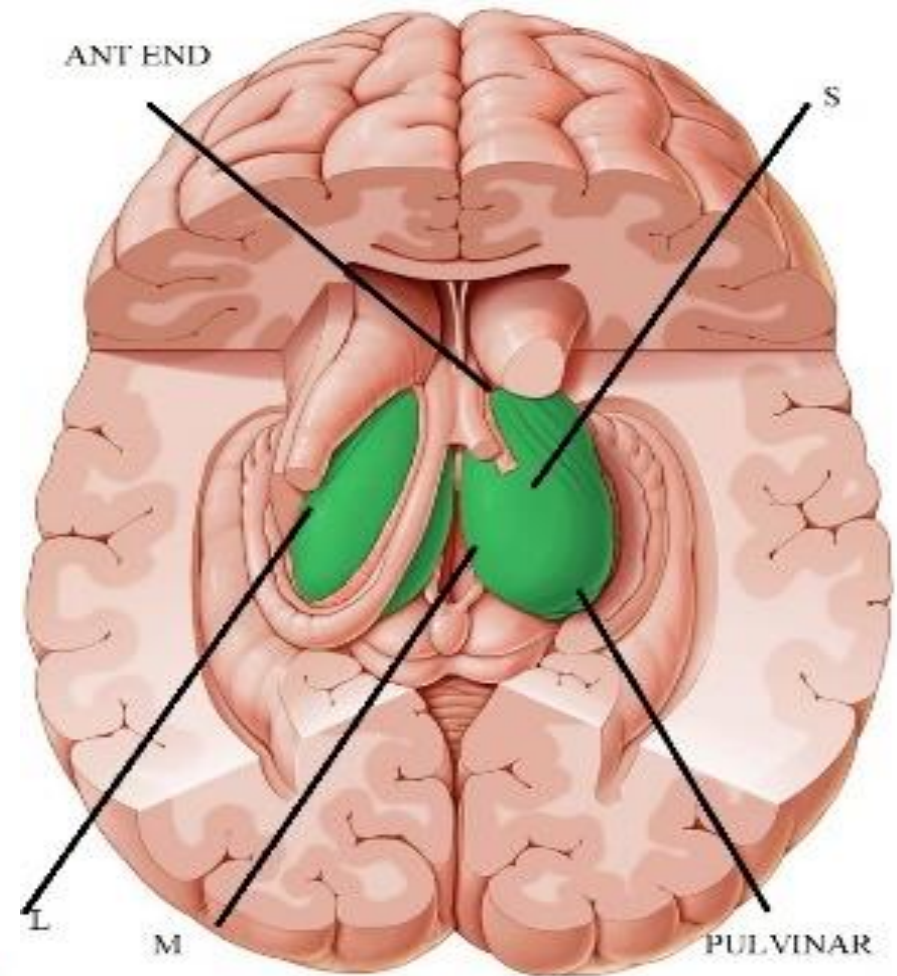
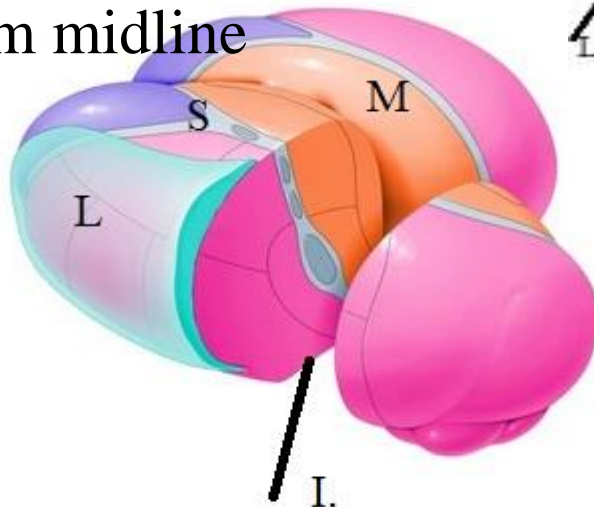
post. end:

wide and so called
Pulvinar.

It lies away from midline

4 Surfaces

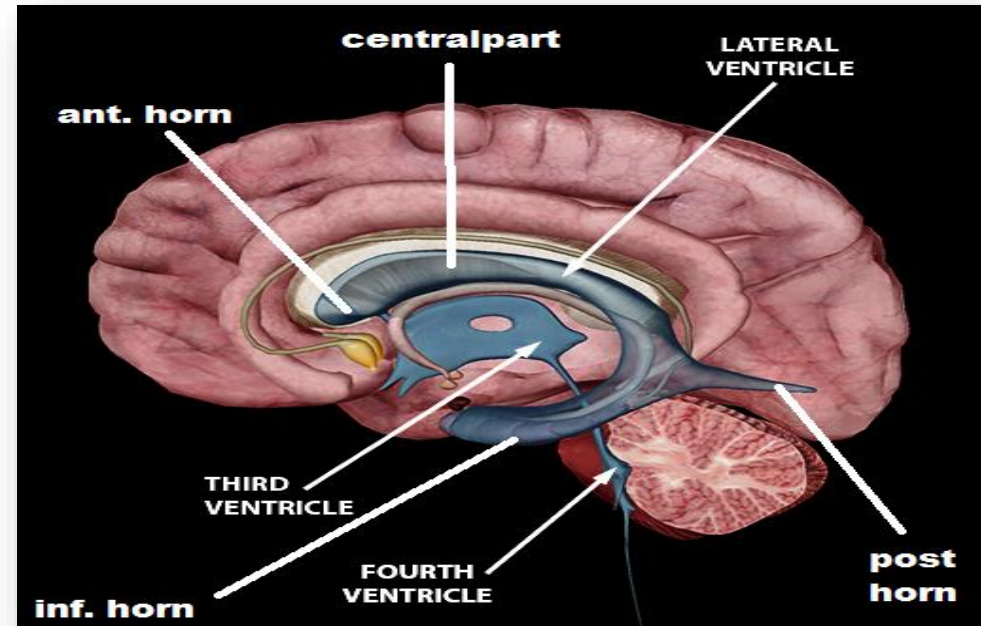
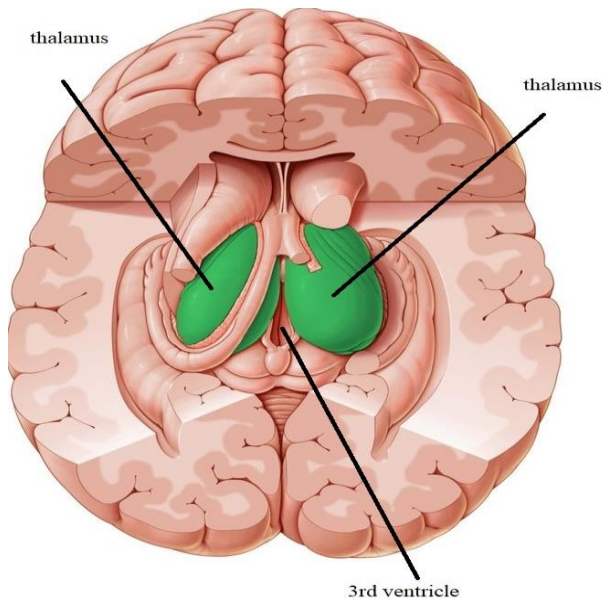
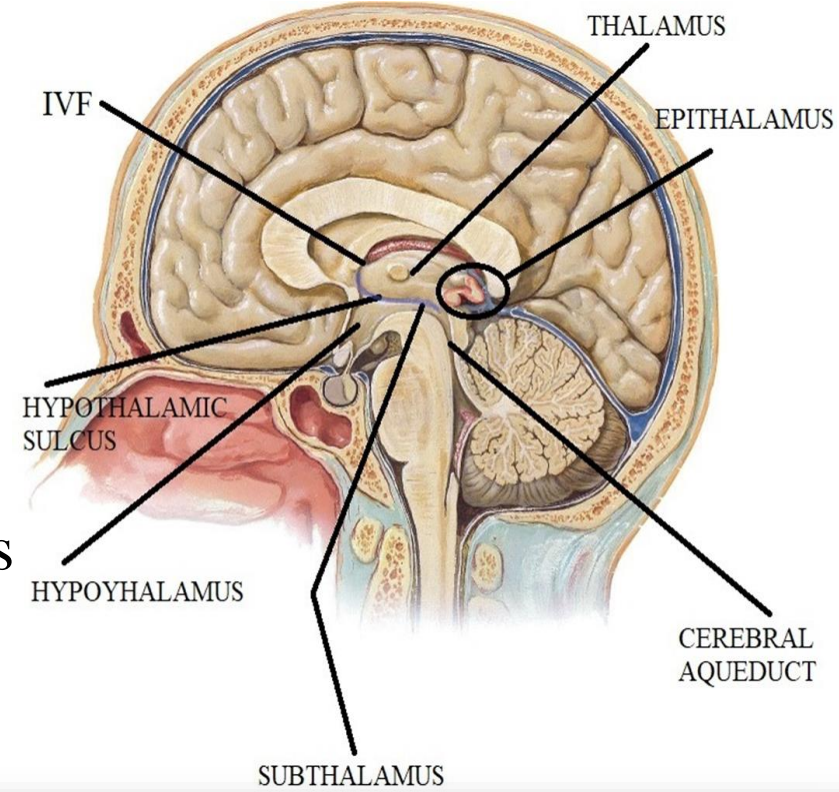
superior,
inferior,
medial &
lateral



THALAMUS

Position:

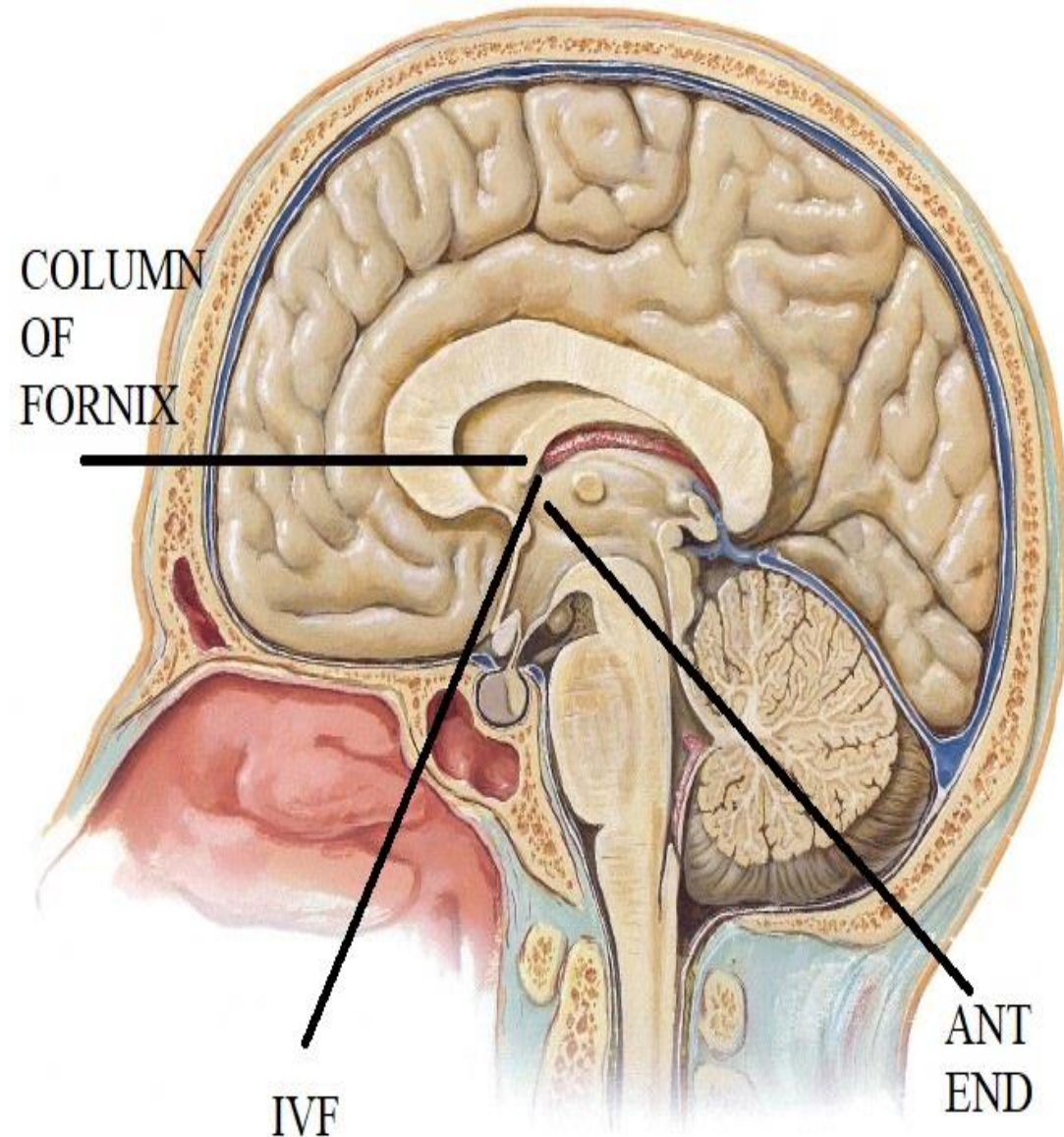
- lies above tegmentum of midbrain, separated from it by subthalamus
- lies in the lateral wall of 3rd ventricle (i.e. separated from the opposite thalamus by the 3rd ventricle)
- and in the floor of the central part of lateral ventricle



THALAMUS

Relations:

ant. end (ant. tubercle):
forms the **post. Boundary**
of interventricular foramen
of Monro that separate it
from **column of fornix**



THALAMUS

Relations:

post. end (Pulvinar):

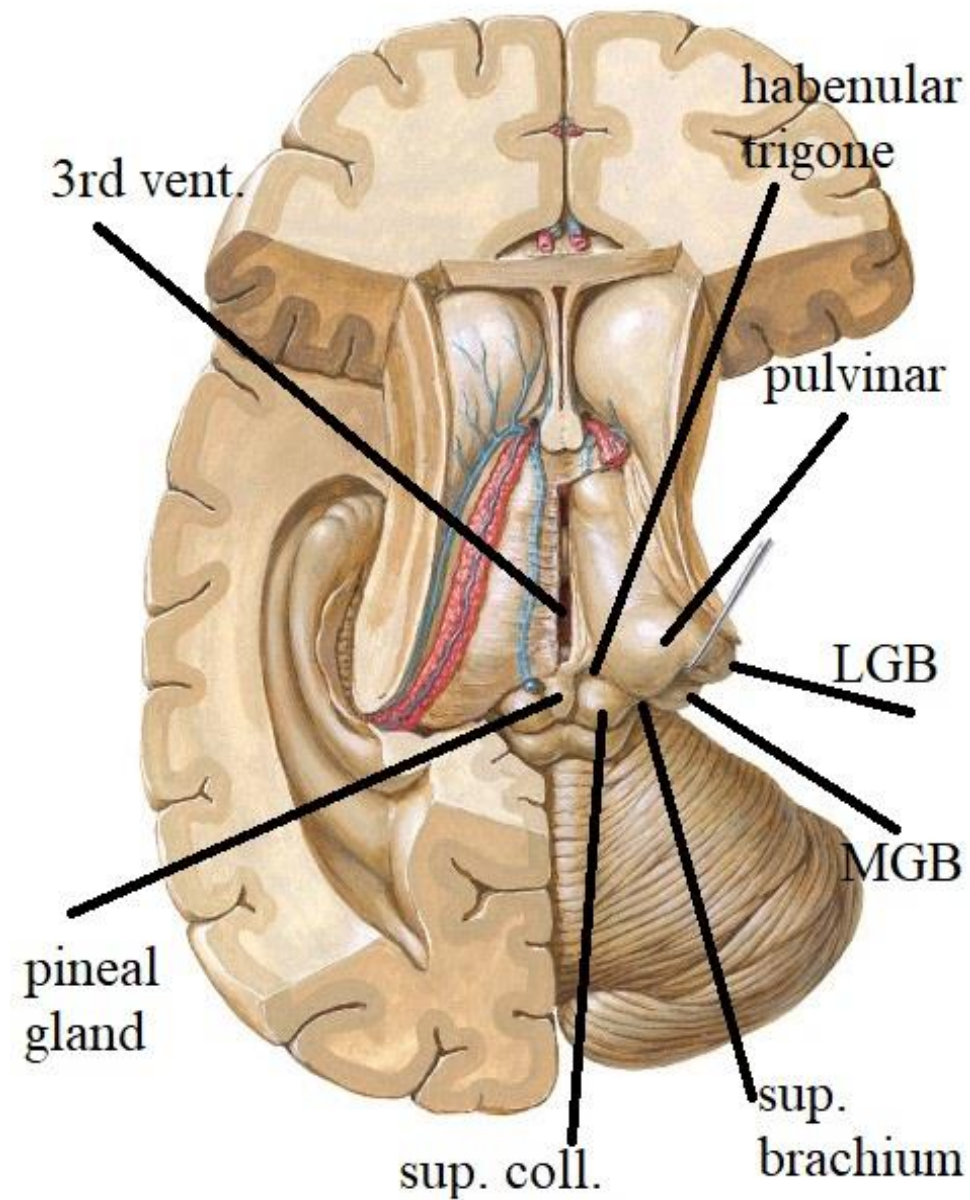
1-not represented in lateral wall of 3rd ventricle as it extends more posteriorly than the post. limit of the 3rd ventricle

2-medially:

it is separated from its fellow by Epithalamus (pineal body & habenular trigones)

3-inferiorly:

it overhangs the Metathalamus (LGB&MGB) and the superior colliculus & its brachium



THALAMUS

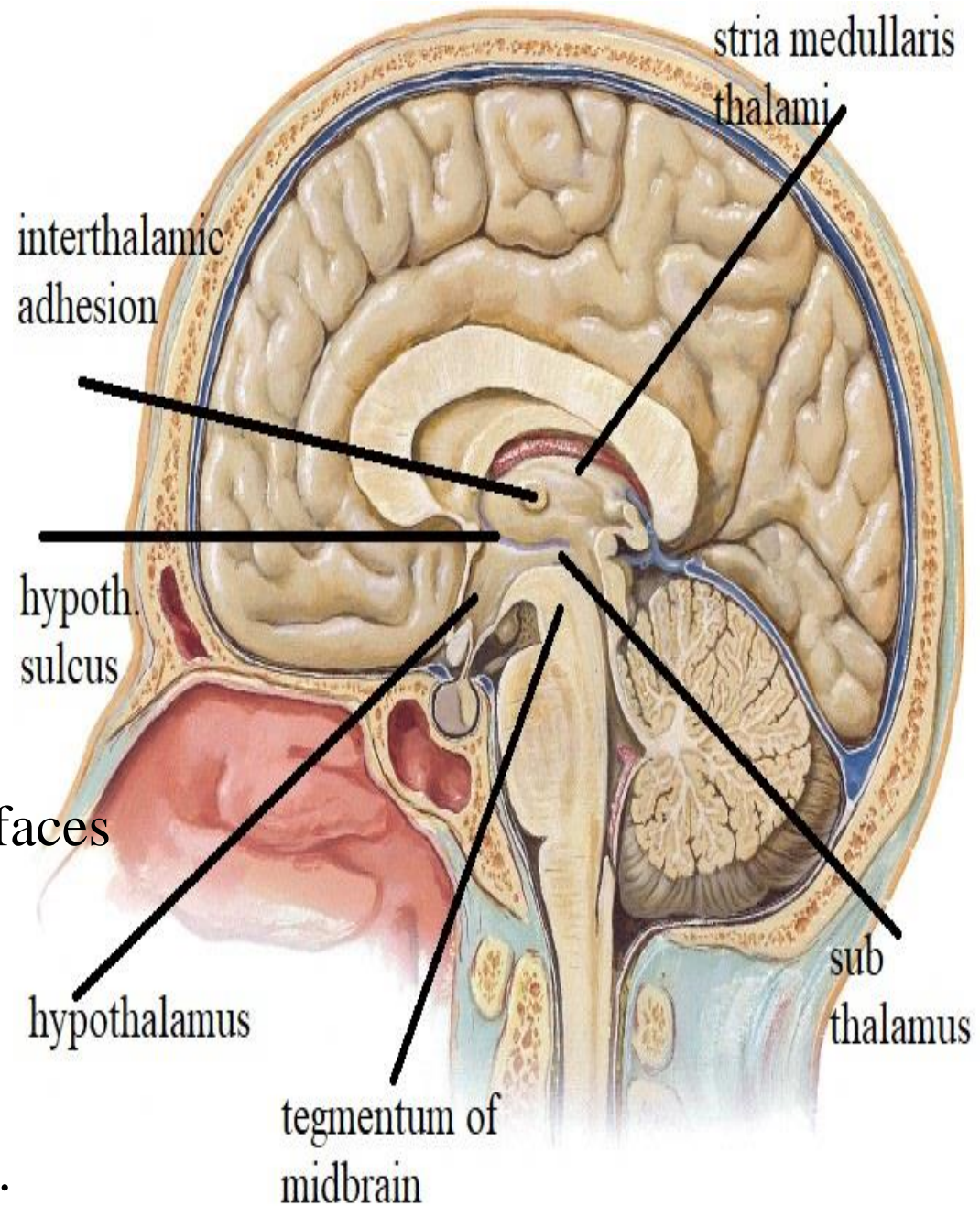
Relations:

inferior surface:

- 1- hypothalamic sulcus
- 2- hypothalamus: anteriorly
- 3- subthalamus :posteriorly

medial surface:

- 1- stria medullaris thalami (stria habenularis): white matter band between medial & superior surfaces
- 2- it forms the upper part of the lateral wall of 3rd ventricle
- 3- interthalamic adhesions: grey matter connects the 2 thalami through 3rd ventricle.



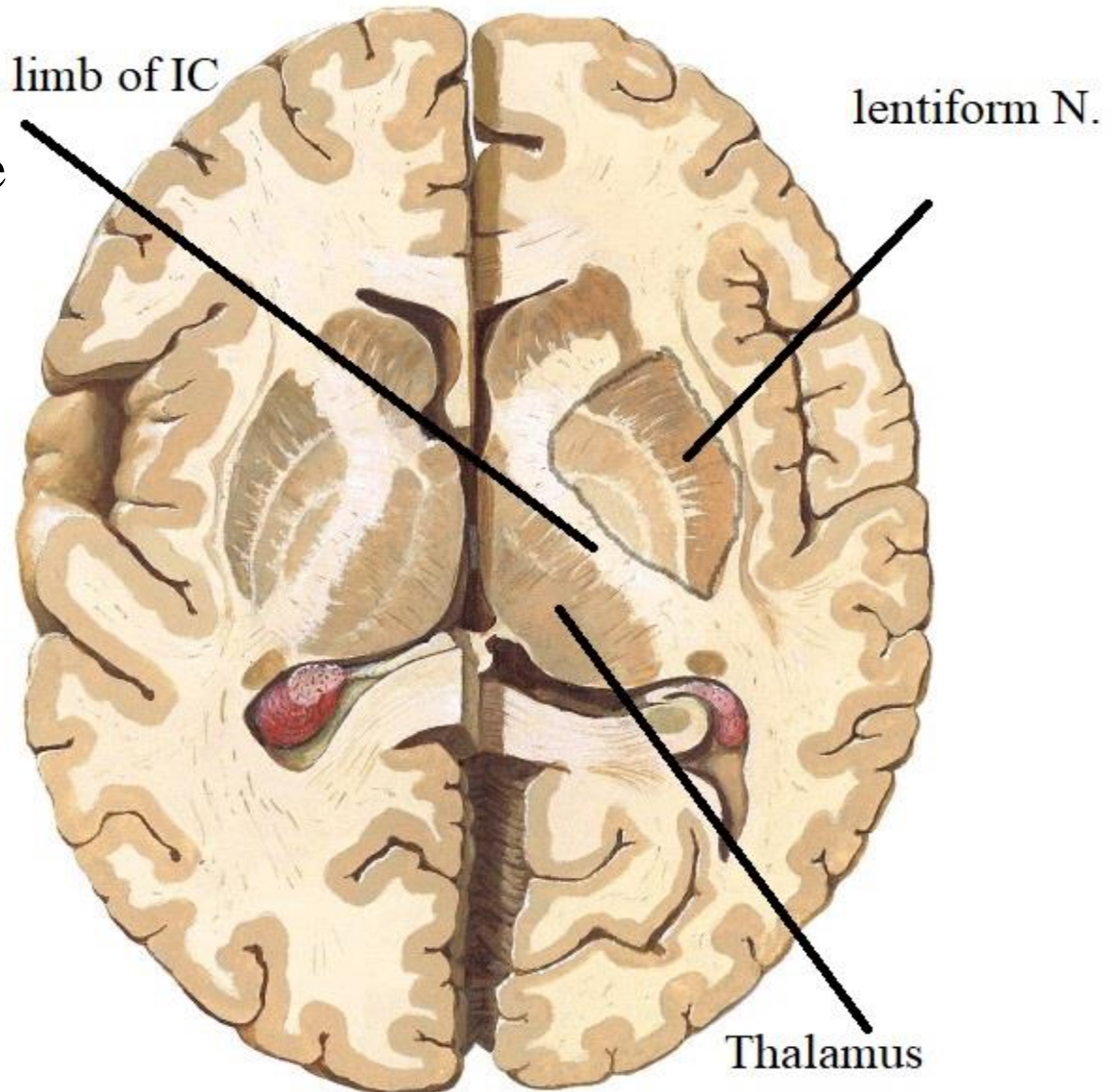
THALAMUS

Relations:

lateral surface:

1-post. limb of int. capsule

2-lentiform nucleus



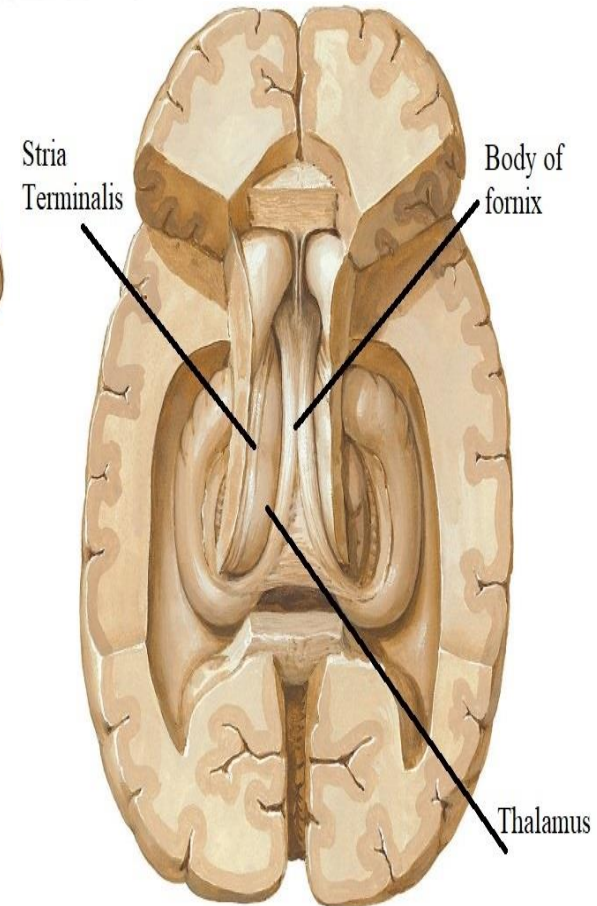
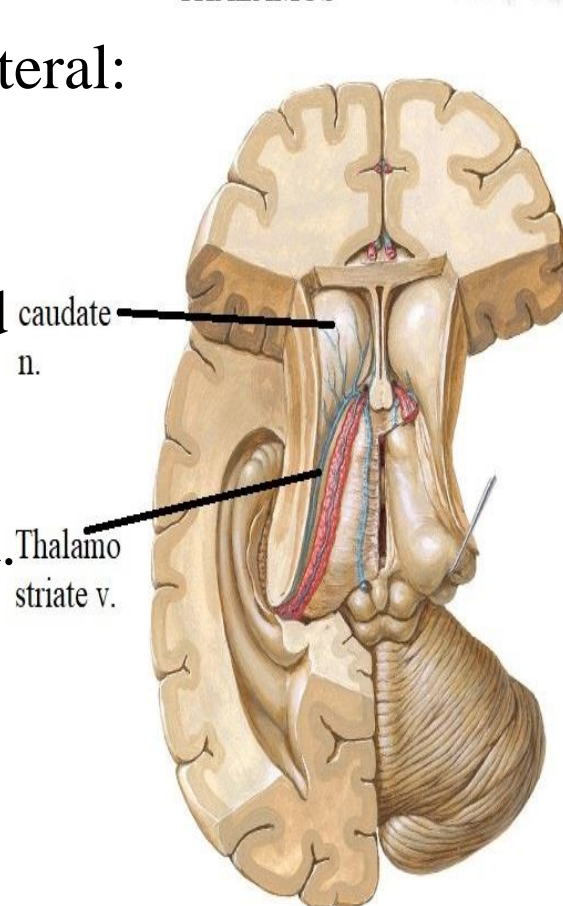
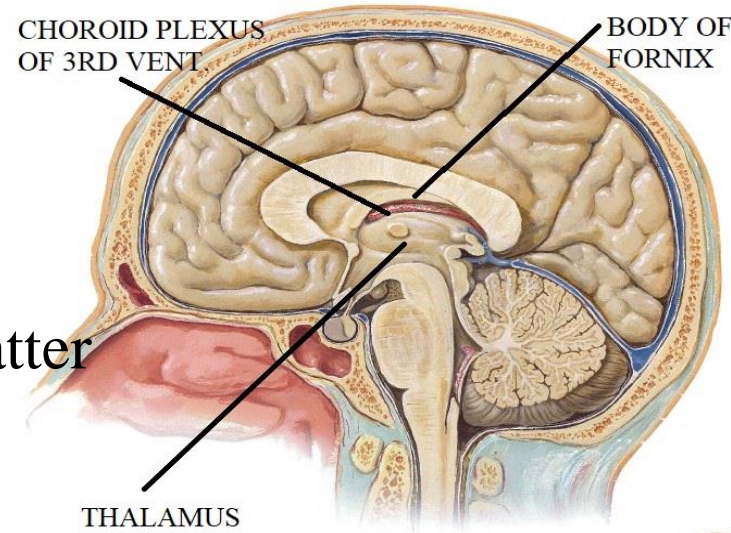
THALAMUS

Relations:

superior surface:

- Covered by lamina of white matter called stratum zonale
- Related to the following structures from medial to lateral:

- 1- body of fornix.
- 2- tela choroidae of 3rd ventricle :-in the choroid fissure which is the interval between thalamus & fornix
- 3-Central part of lateral vent.
- 4-Thalamostriate vein.
- 5- Stria terminalis.
- 6-Body of caudate nucleus.



THALAMUS

Internal structure:

white and grey matter (mainly grey)

white matter: its main mass forms

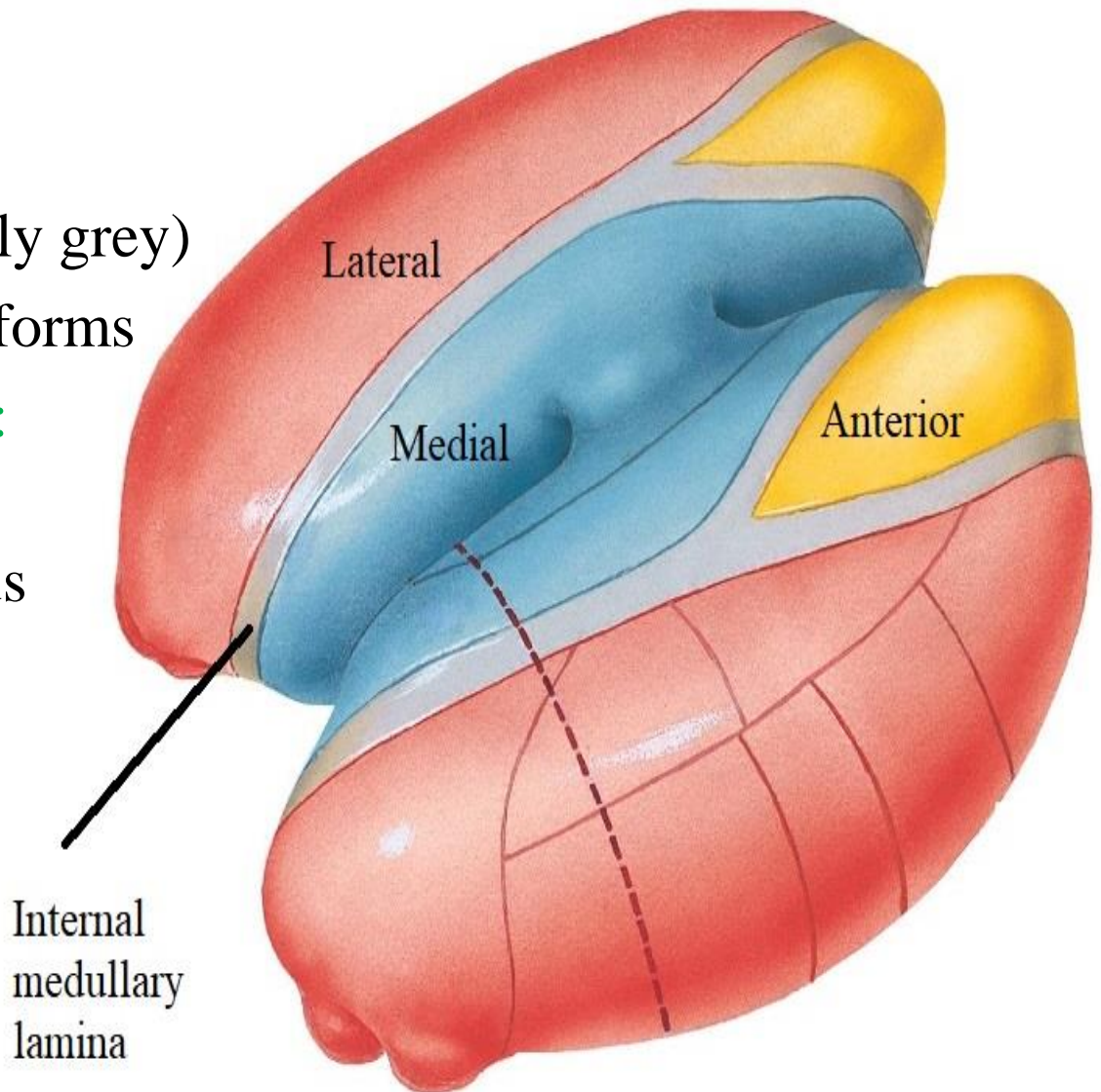
a-external medullary lamina:

thick layer of nerve fibers
on lateral surface of thalamus

b-internal medullary lamina:

y shaped lamina that
divide the thalamus

into ant. , medial &
lateral groups of nuclei



THALAMUS

Internal structure:

grey matter: nuclei

1- ant. group : () the 2 ant. limbs of int. medullary lamina

2- medial group : medial to int. medullary lamina

3- lateral group : lateral to int. medullary lamina

Dorsal group

Lateral dorsal (LD)

Lateral posterior (LP)

Pulvinar

Ventral group

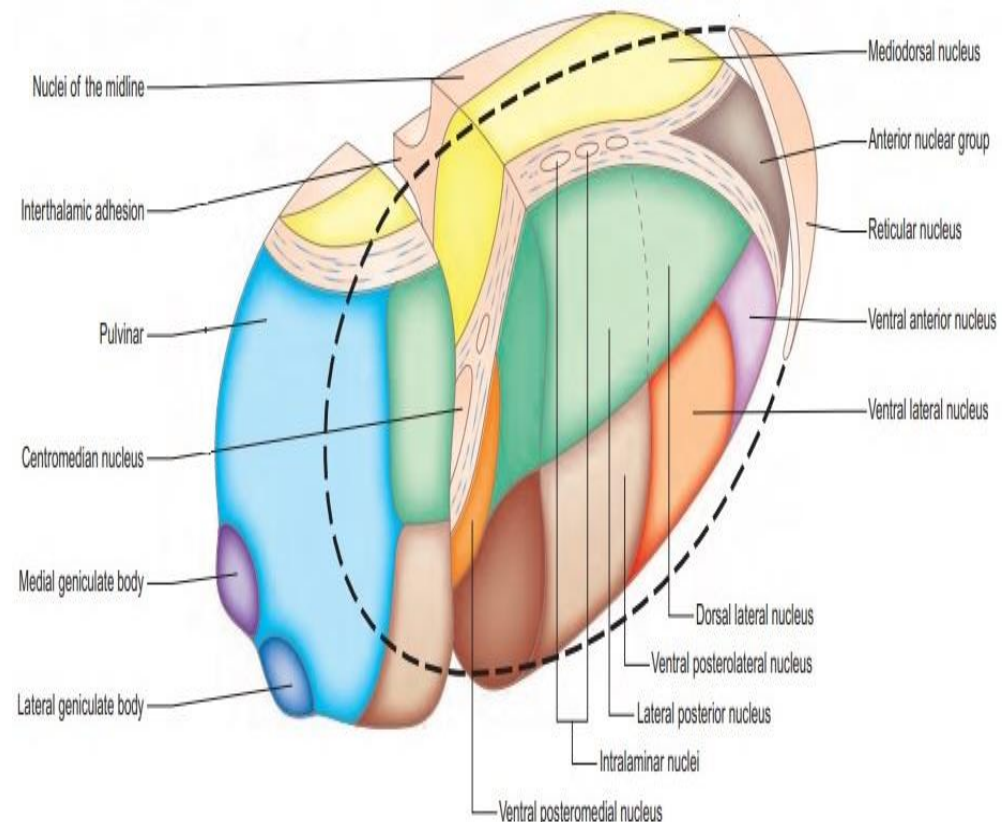
-ventral anterior (VA)

-ventral lateral (VL)

-ventral posterior (VP)

ventral post. lateral (VPL)

ventral post. medial (VPM)



THALAMUS

Internal structure:

grey matter:

4-centromedian (intralaminar) group:

lies in post. limb of
int. medullary lamina

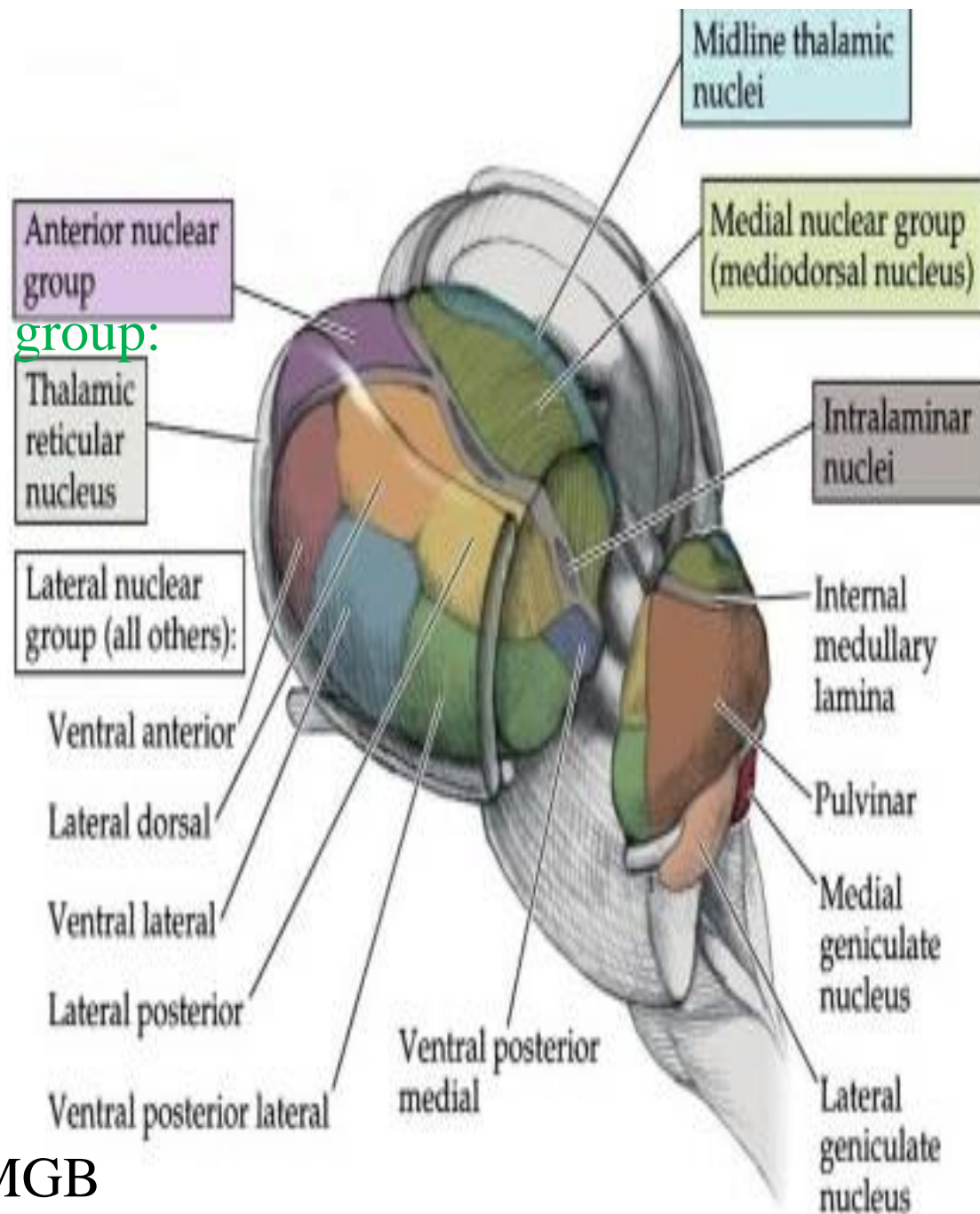
5-midline group:

in the lateral wall of
3rd ventricle

6-reticular group:

shell like lateral covering on
lateral surface separated from
other nuclei by
the ext. medullary lamina

7-geniculate group: LGB & MGB



THALAMUS

Functions & connections

1-relay station in all sensations (except olfaction) before the cerebral cortex

N.B.: the thalamus can appreciate Pain and temperature

Afferents

-medial lemniscus to VPL

carry conscious proprioception & fine touch from body except head

-spinal lemniscus to VPL

carry pain, temperature & simple touch from body except head

-trigeminal lemniscus to VPM

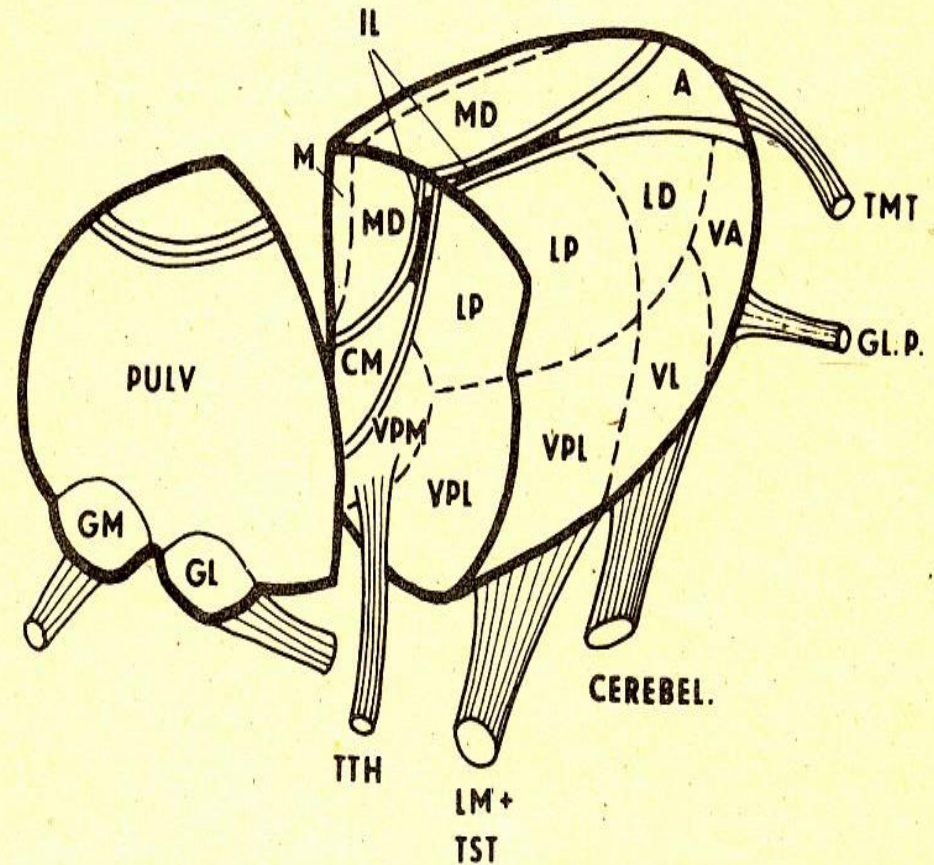
carry all mentioned sensations from head plus taste

-lateral lemniscus to MGB

carry hearing

-optic tract to LGB

carry vision



THALAMUS

Functions & connections

2-maintenance of wakefulness & alertness

Afferents

-reticular formation nuclei (of same side)

to centromedian (intralaminar) & midline nuclei

3-emotional state & recent memory

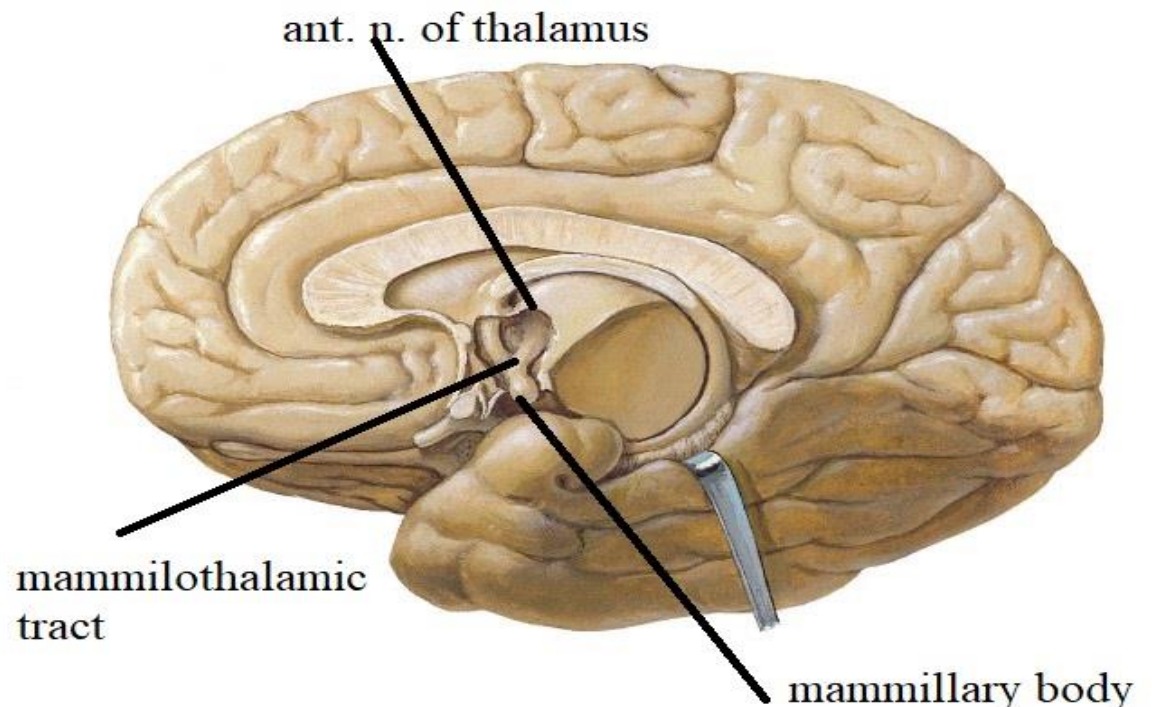
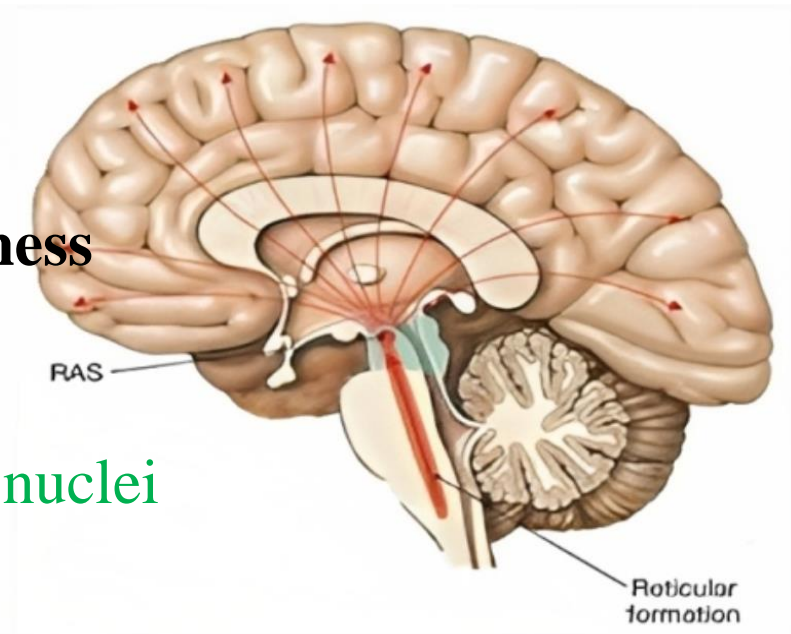
Afferents

Hypothalamus :-

mamillothalamic tract

from mammillary body

to ant. Nucleus



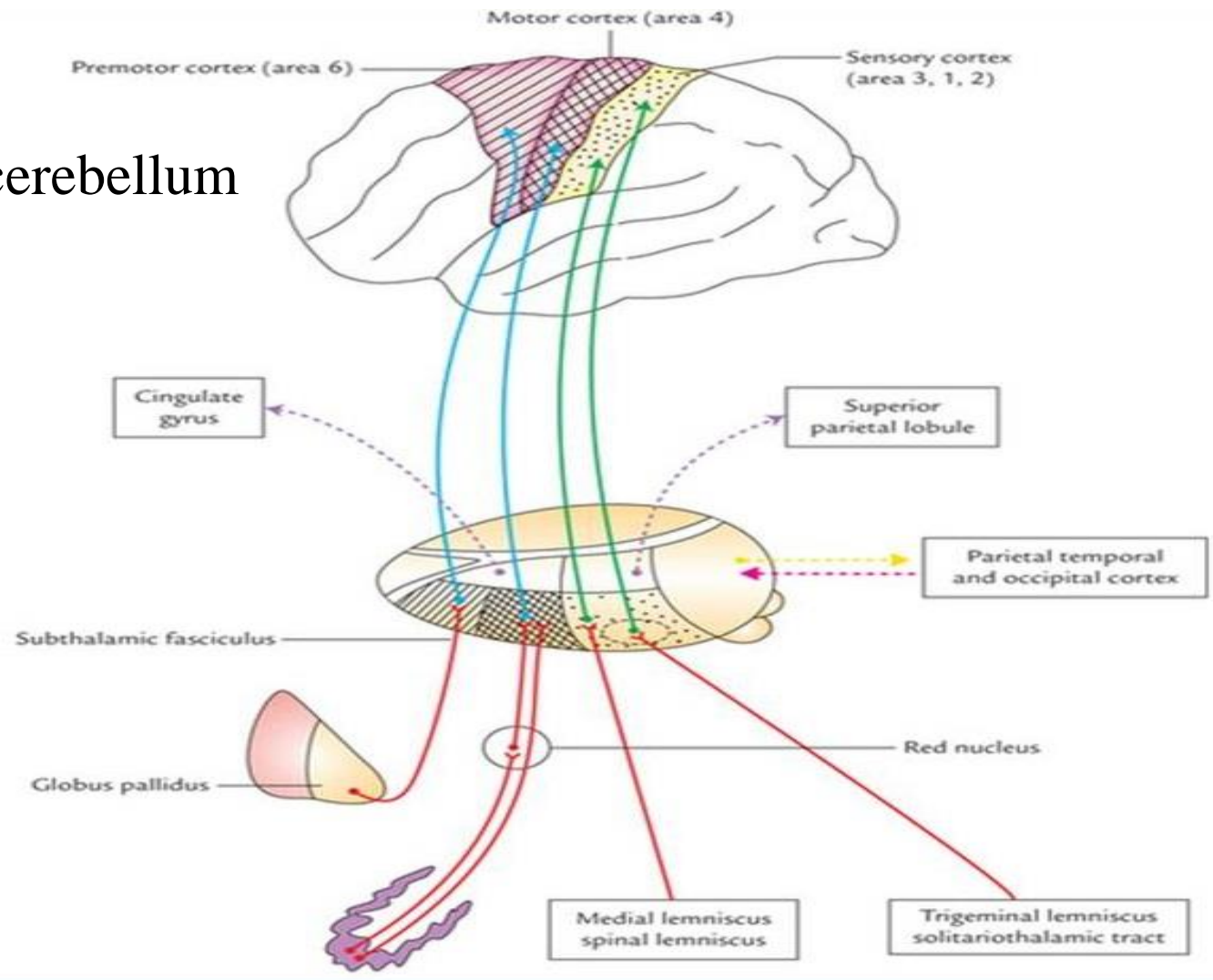
THALAMUS

Functions & connections

4- motor function as part of extrapyramidal system

Afferents

- corpus striatum
- dentate nucleus of cerebellum
- red nucleus



THALAMUS

Functions & connections

Efferents: to

1- cerebral cortex

in form of thalamic radiations

(fibers from thalamus to cerebral cortex)

- **ant. thalamic radiation:**

- **superior thalamic radiation (sensory radiation) :**

- **post. thalamic radiation**

-**inferior thalamic radiation**

2-**interconnection** with: spinal cord, brain stem, hypothalamus and corpus striatum

METATHALAMUS

The part of diencephalon that attaches to inferior surface of Pulvinar

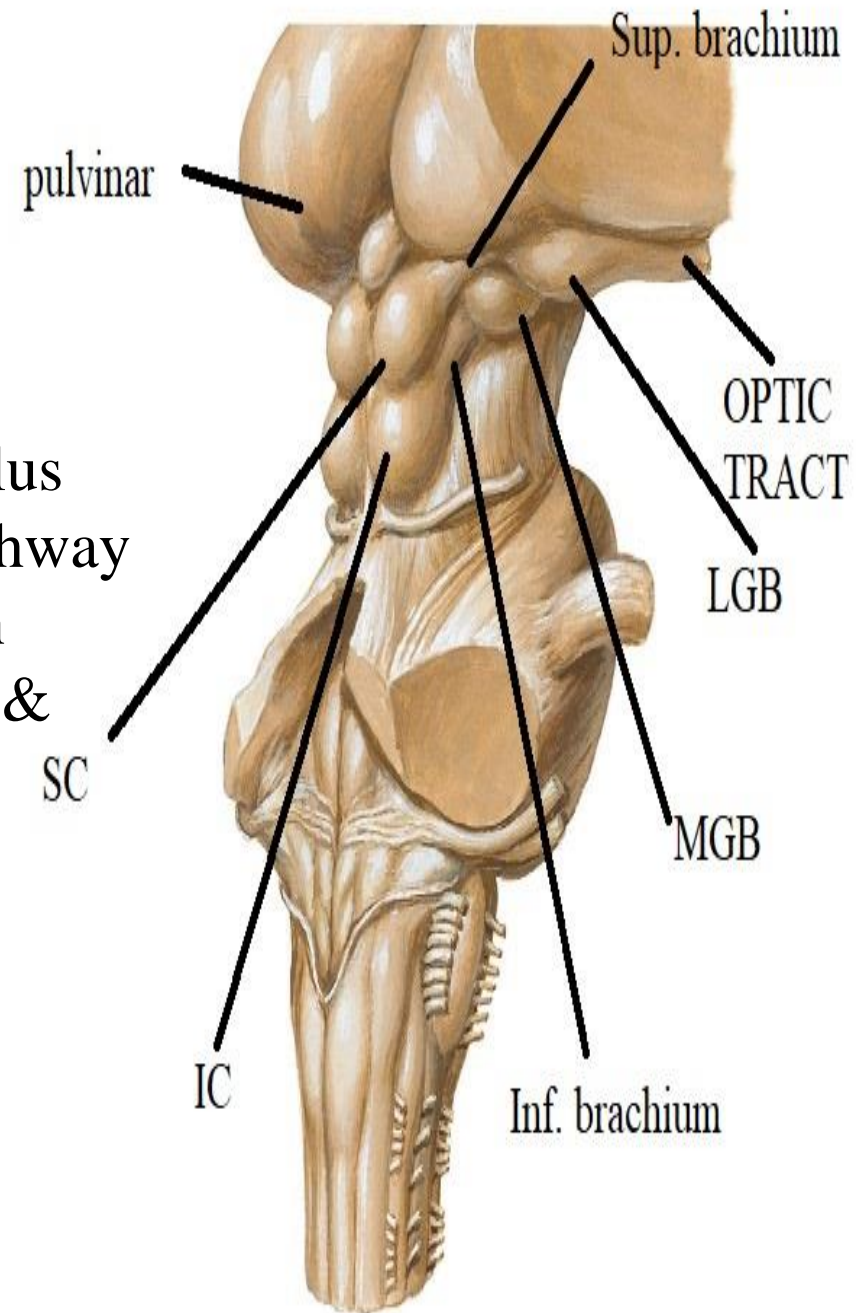
Medial geniculate body (MGB)

Site:- small ovoid mass of grey matter, situated lateral to superior colliculus

Function:- lower center in auditory pathway

afferent:- inferior brachium that contain fibers from inferior colliculus & from lateral lemniscus

efferent:- auditory radiation to auditory area of temporal lobe



METATHALAMUS

Lateral geniculate body (LGB)

Site:- small ovoid mass of grey matter, situated lateral to MGB.

Function:- lower center in visual pathway

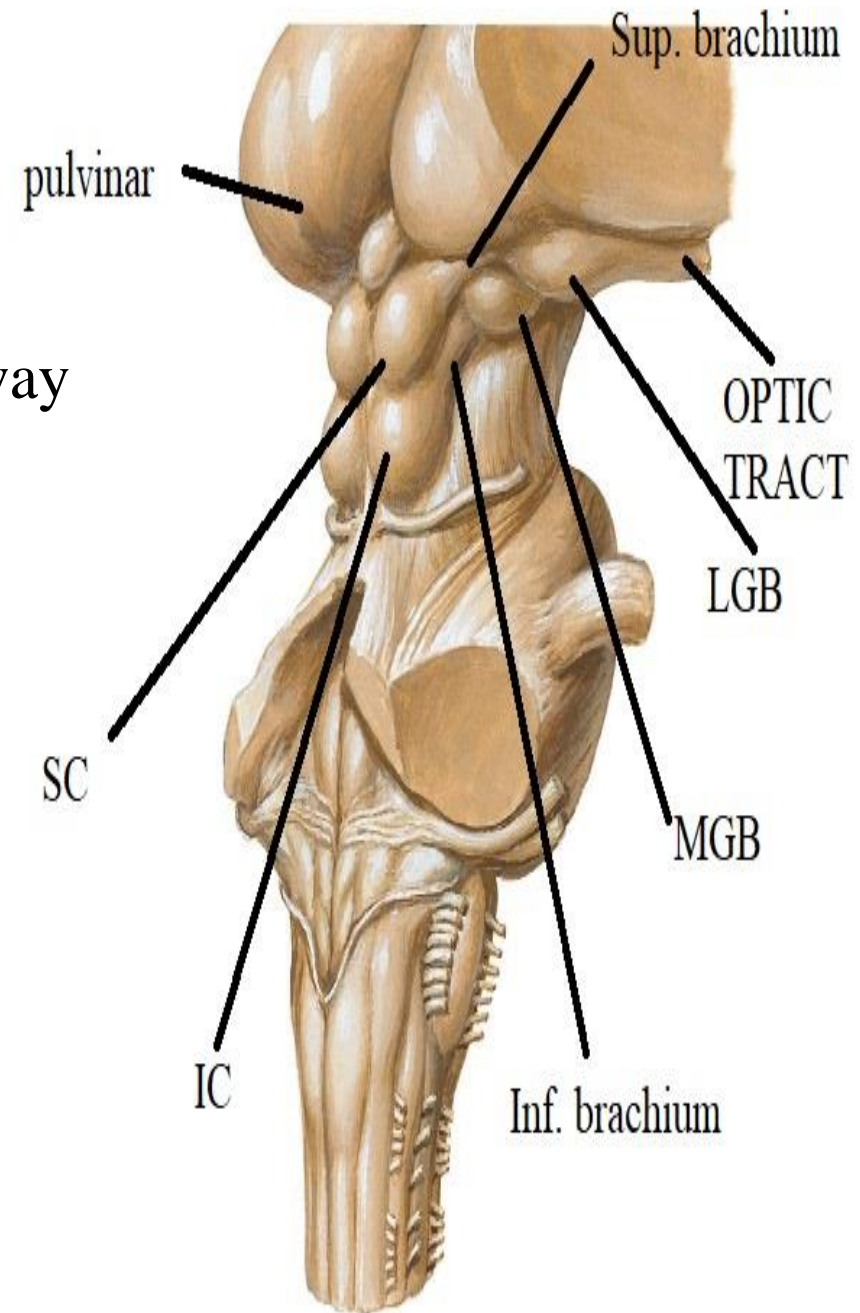
afferent:- visual fibers along the large lateral part of optic tract

efferent:- optic radiation to visual area of occipital lobe

N.B.:-

-it is connected to superior colliculus by superior brachium that contain the small medial part of optic tract

-The superior brachium passes () Pulvinar & MGB



THANQ