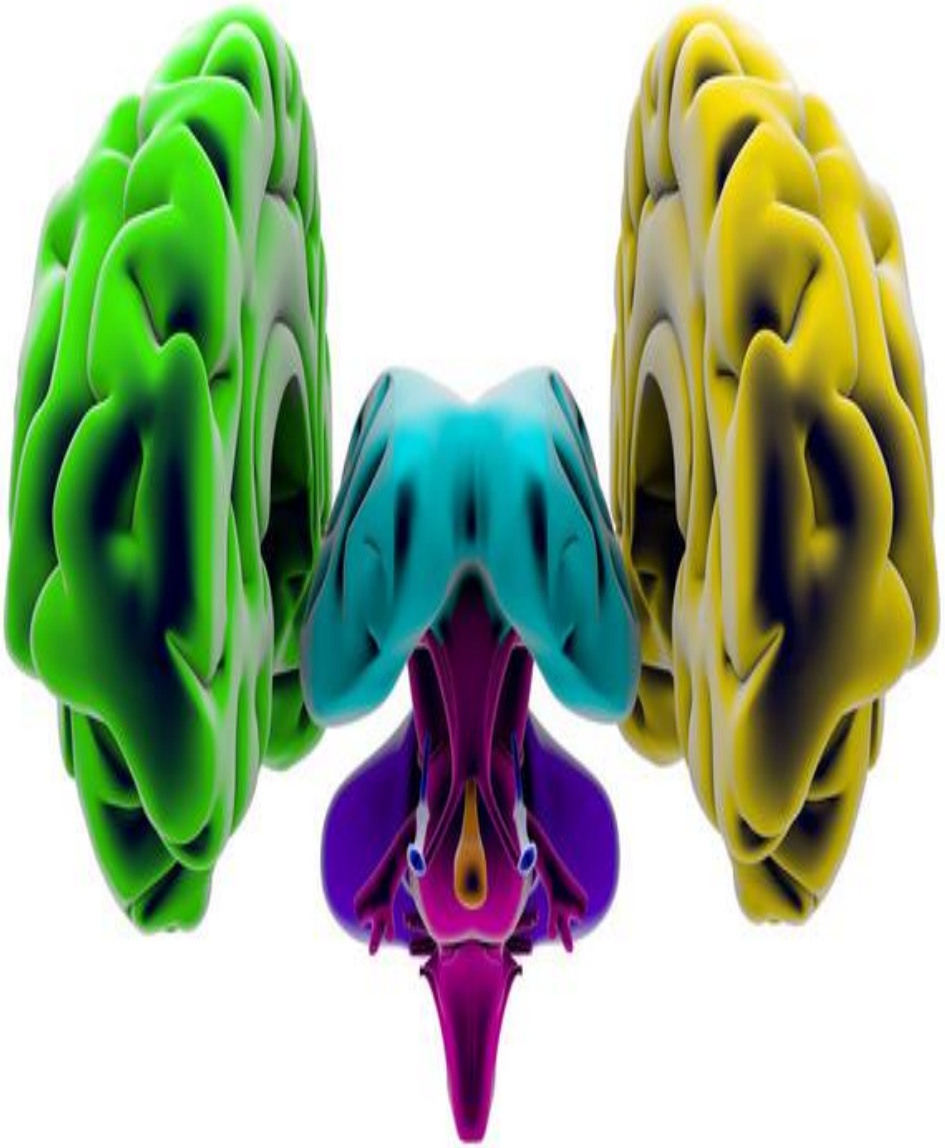
DIENCEPHALON 1



BY

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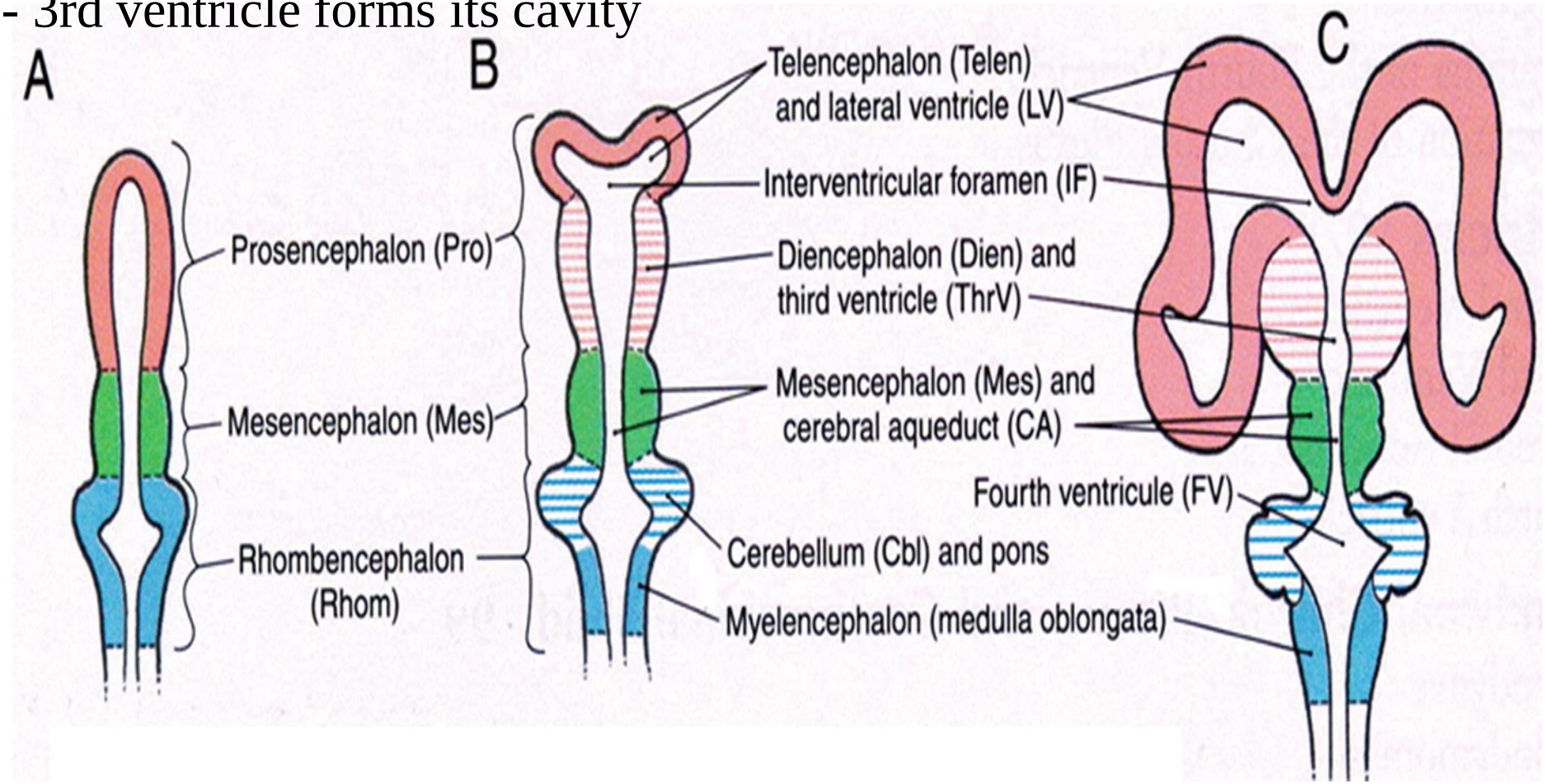
DIENCEPHALON

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

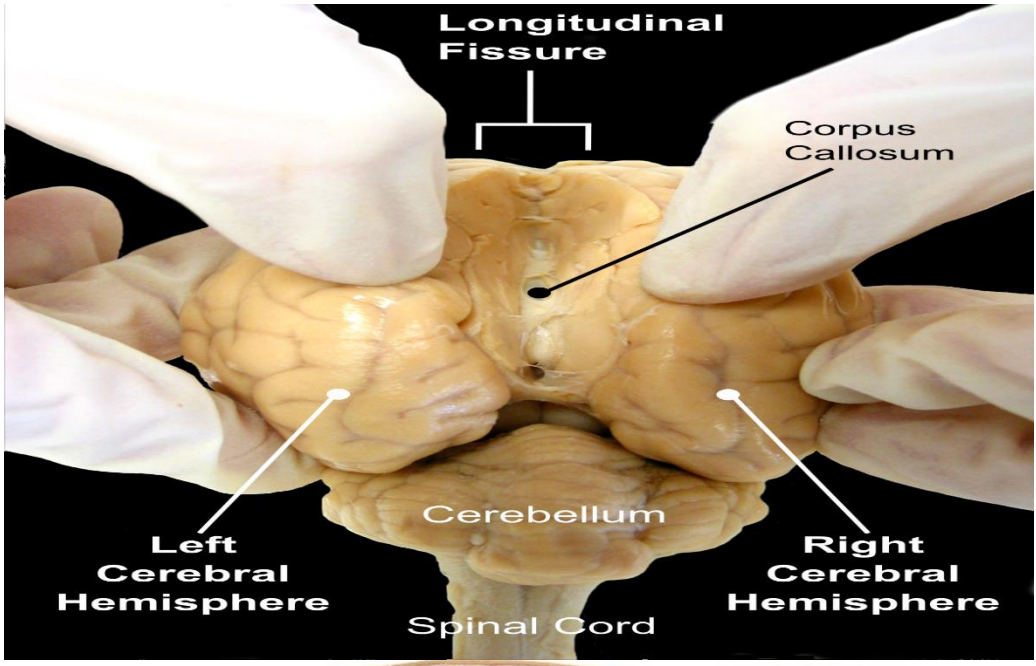
b- Epithalamus

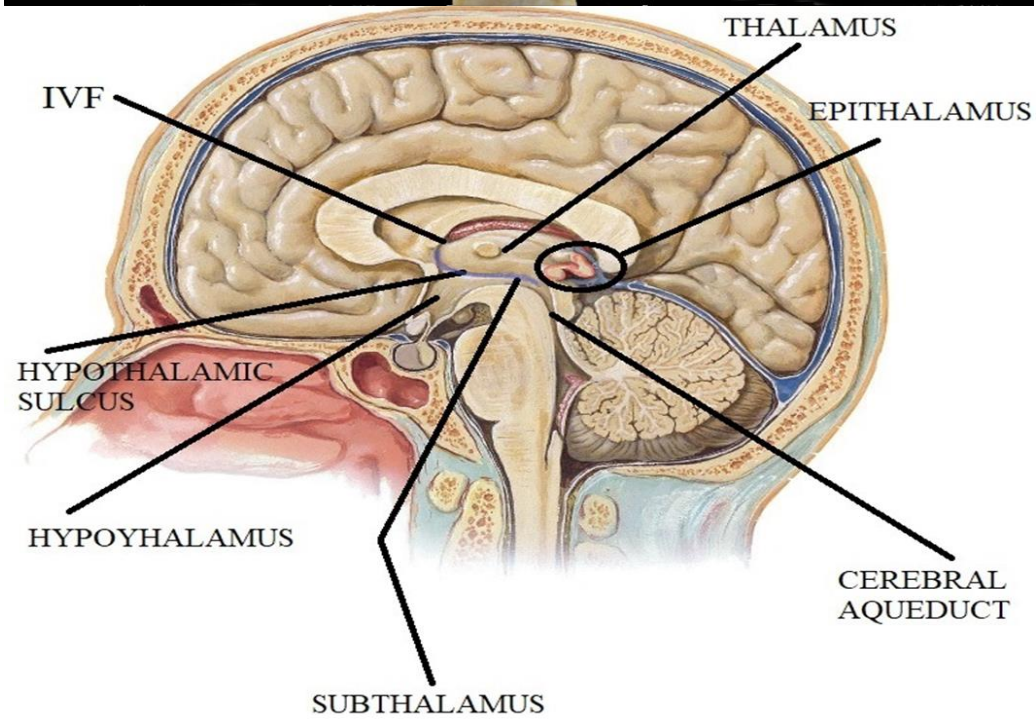
c- Metathalamus

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

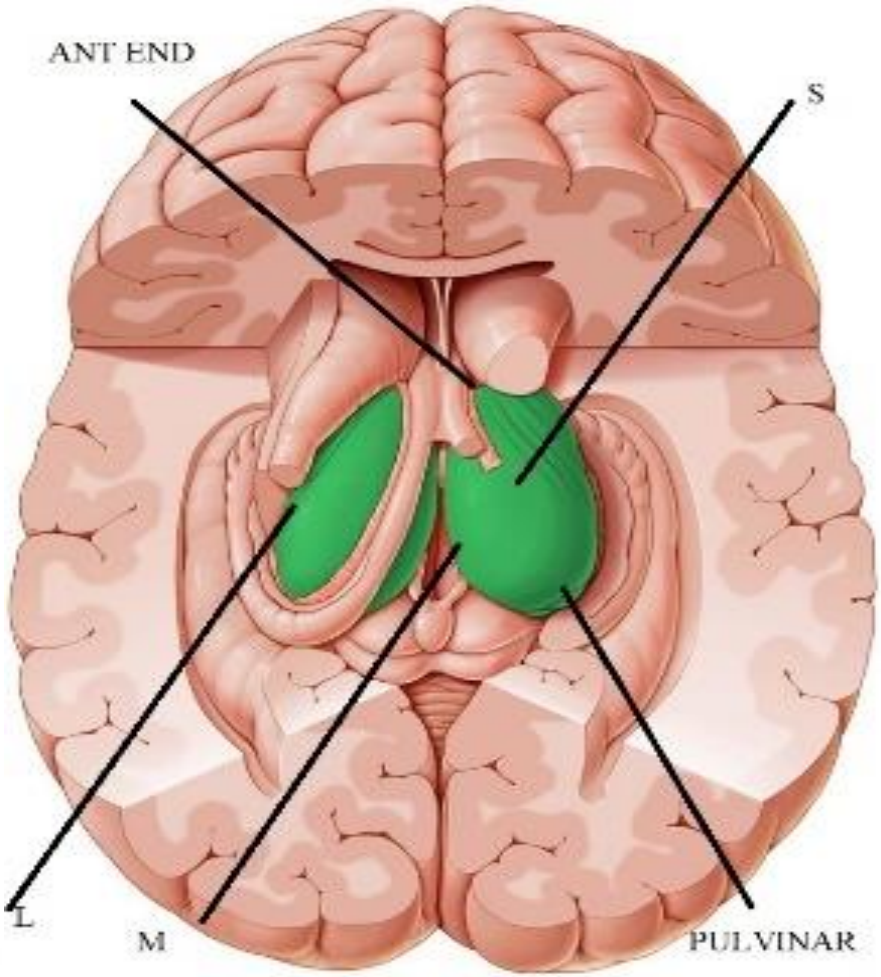
post. end:

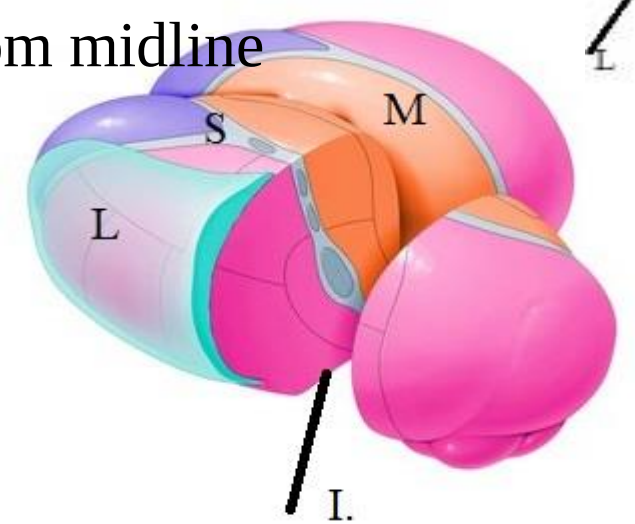
wide and so called Pulvinar.

It lies away from midline

4 Surfaces

superior, inferior , medial & lateral



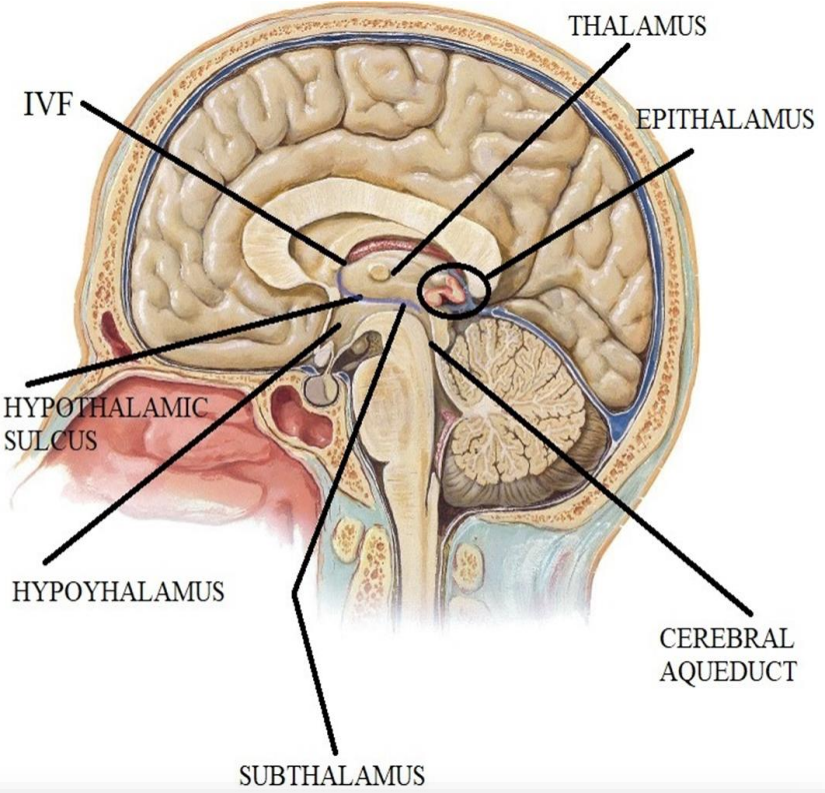


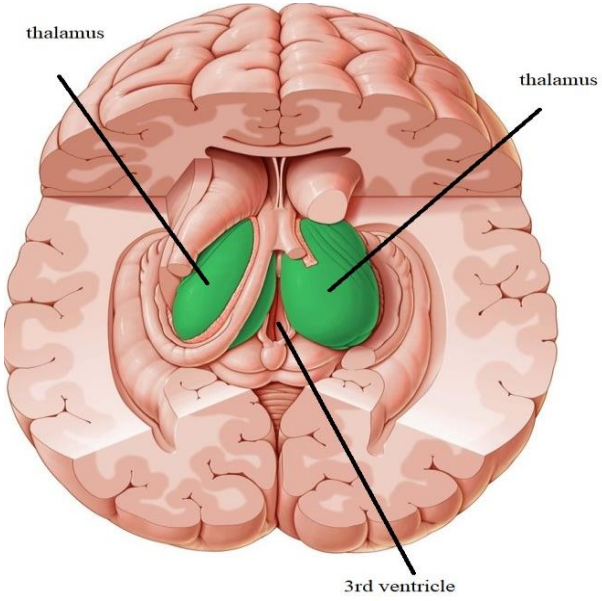
THALAMUS

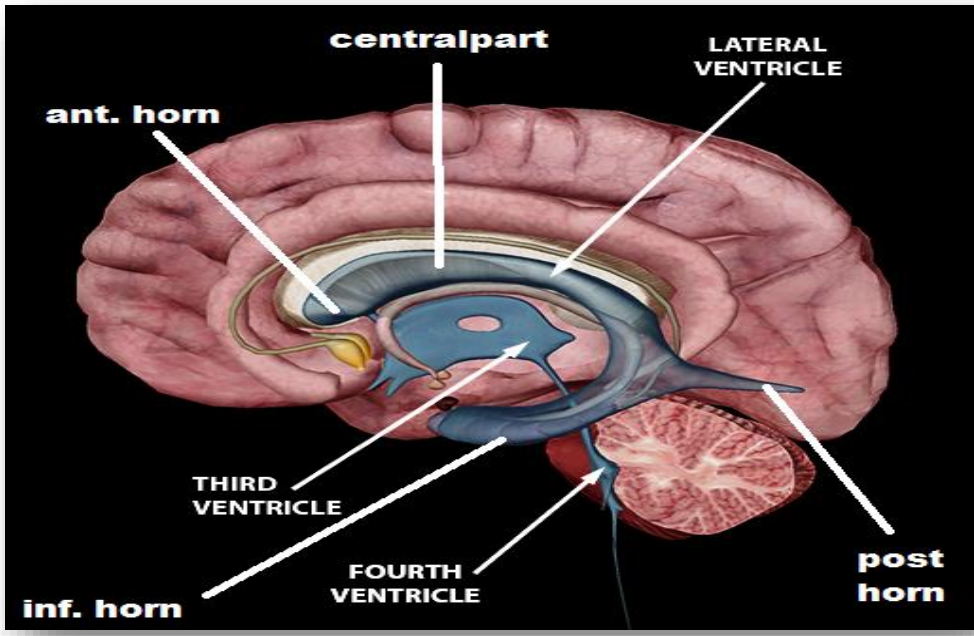
Position:

-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





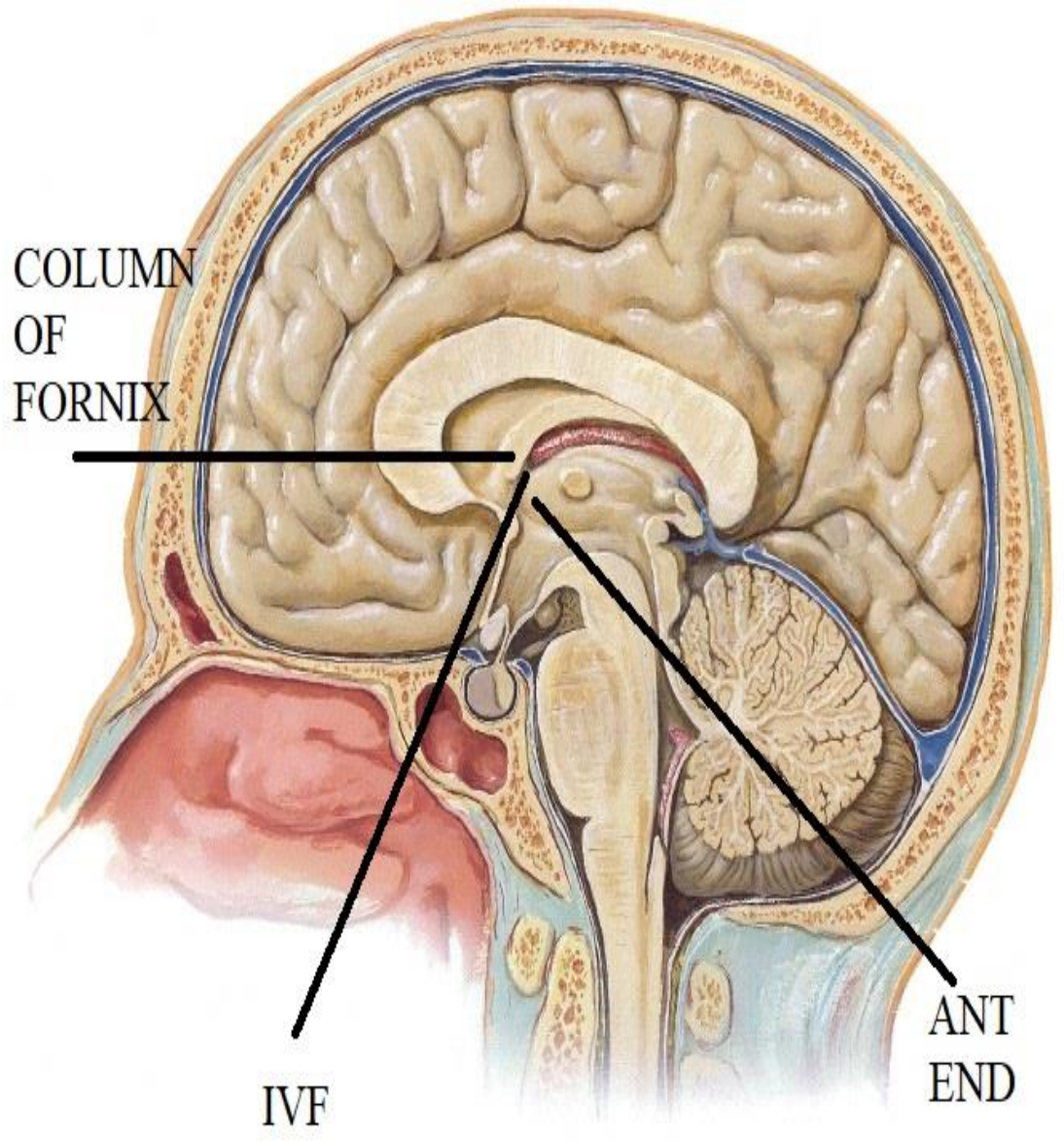


THALAMUS

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):

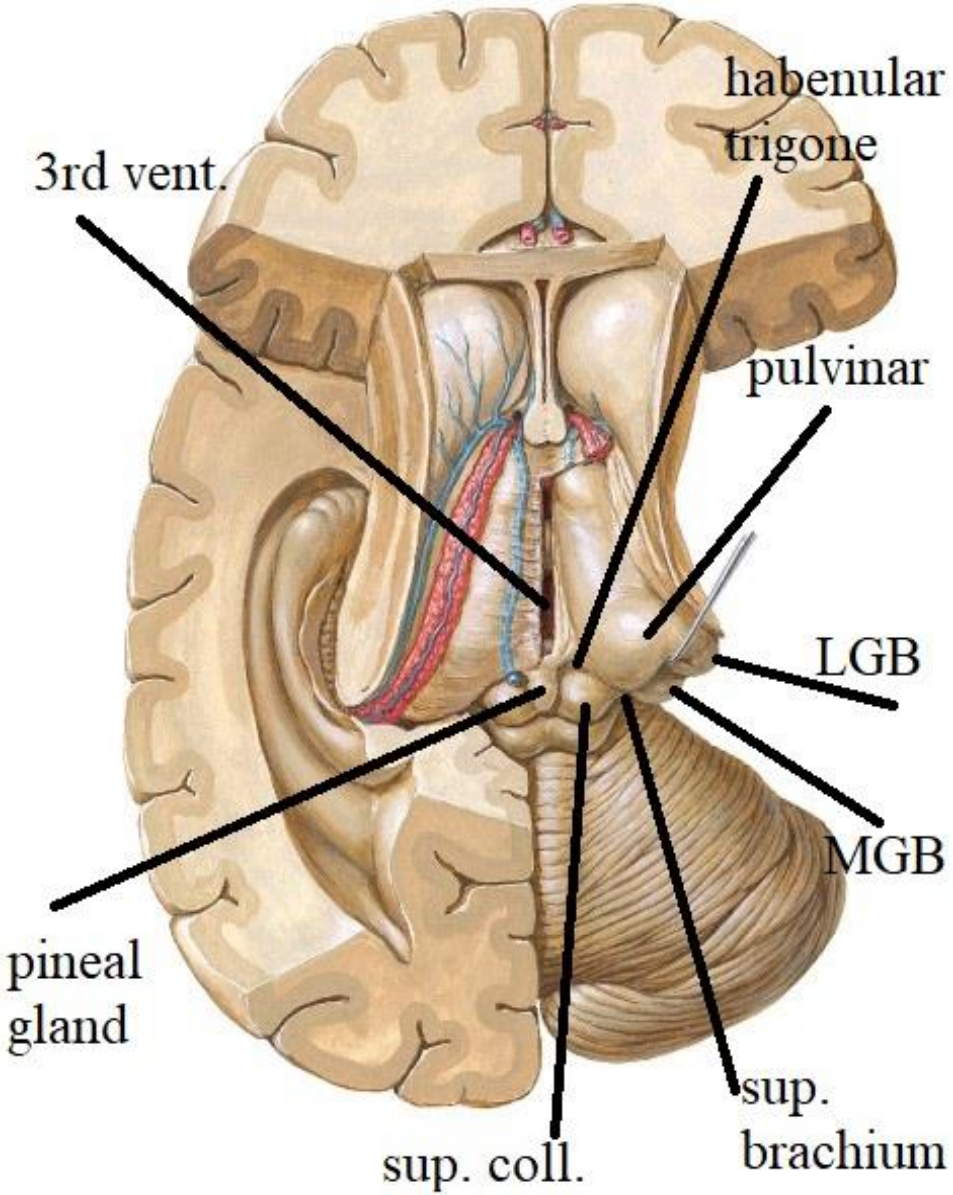
1-not represented in lateral wall of 3rd ventricle as it extends more posteriorly than the post. limit of the 3rd ventricle

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

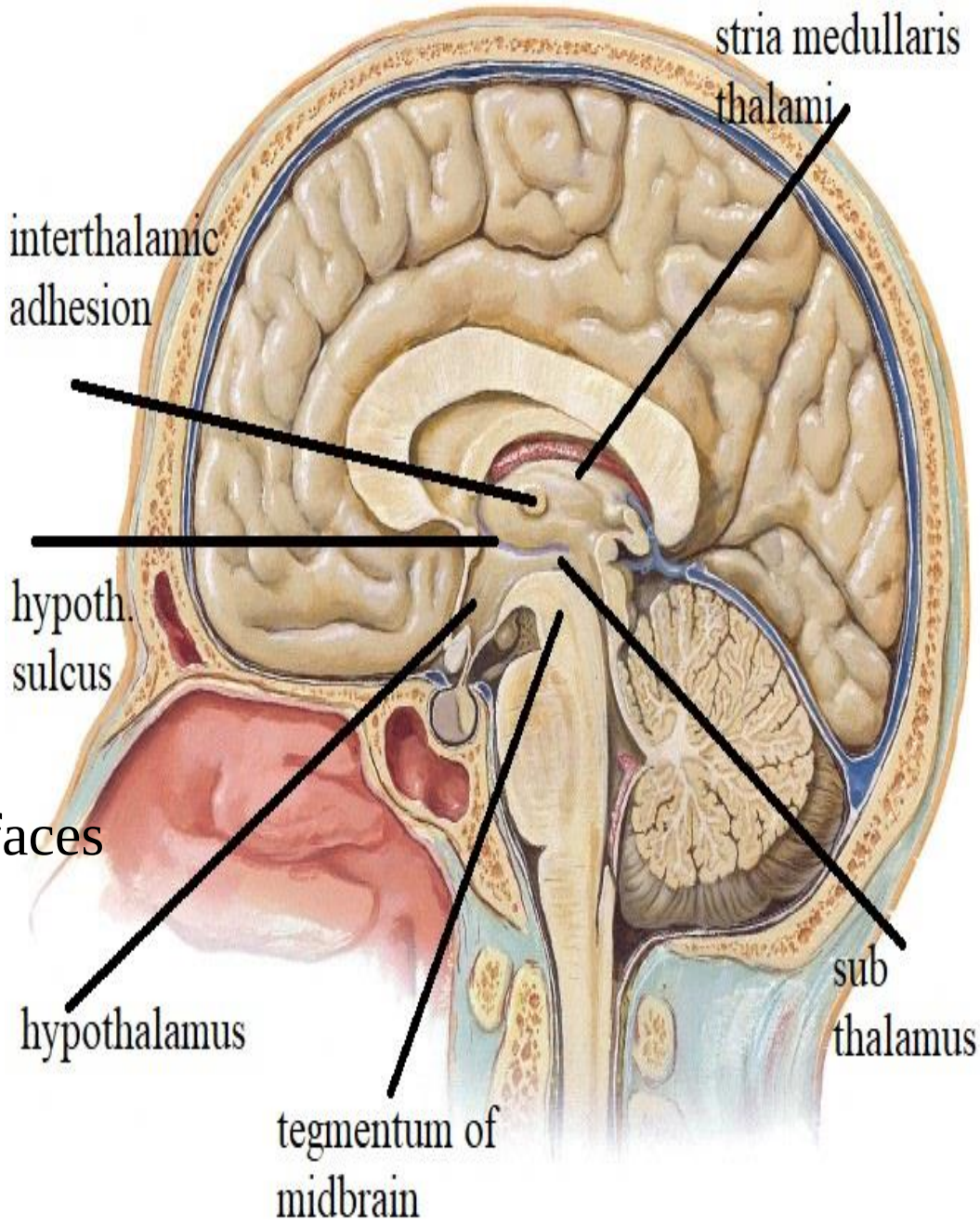
3- subthalamus :posteriorly

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.



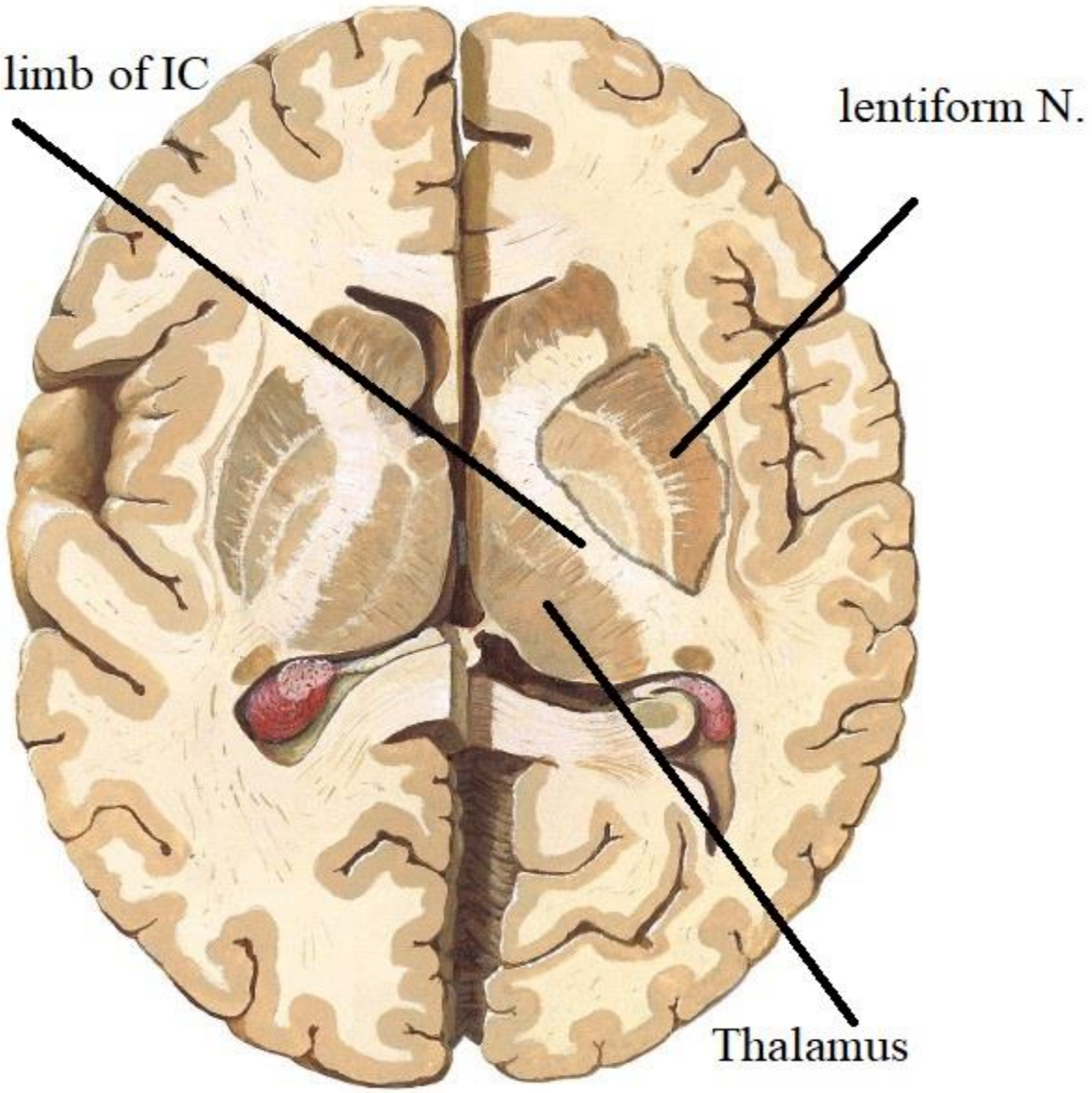
THALAMUS

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.

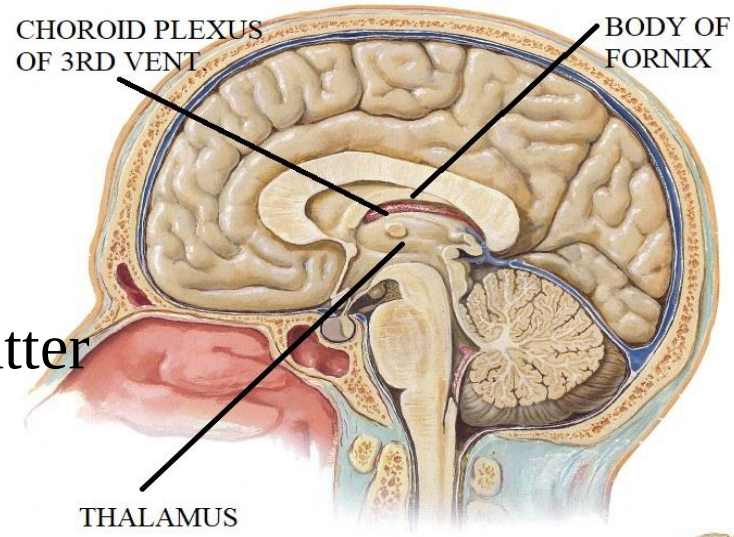
2- tela choroidae of 3rd ventricle :-in the choroid fissure which is the interval ( ) thalamus &fornix

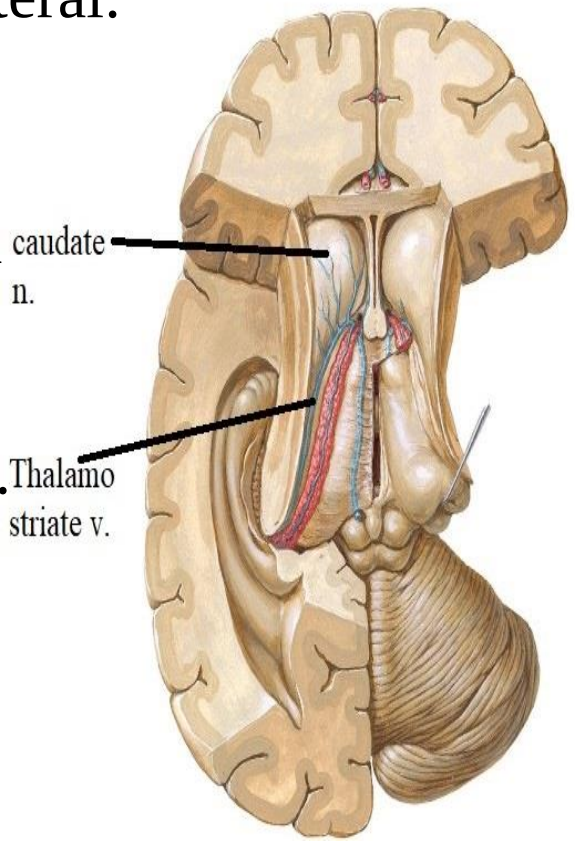
3-Central part of lateral vent.

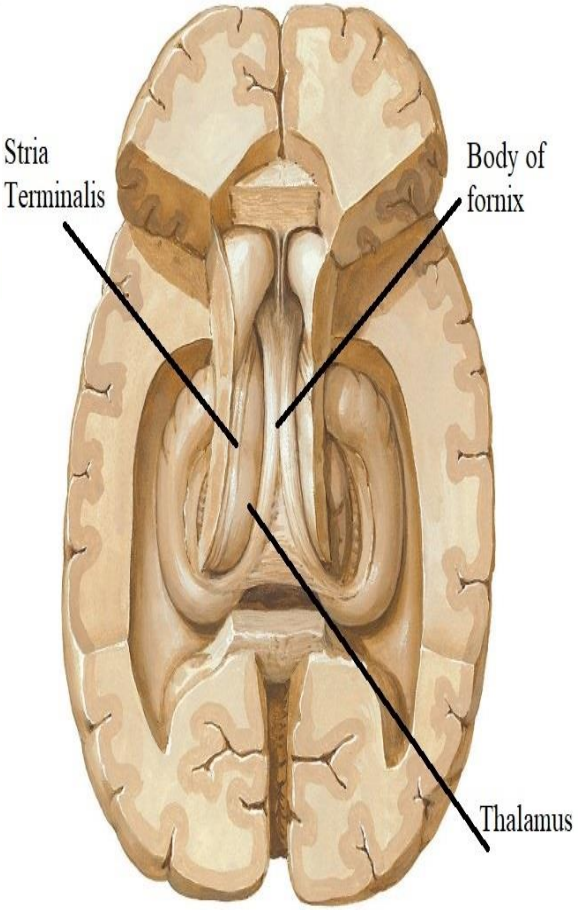
4-Thalamostriate vein.

5- Stria terminalis.

6-Body of caudate nucleus.







THALAMUS

Internal structure:

white and grey matter (mainly grey)

white matter: its main mass forms

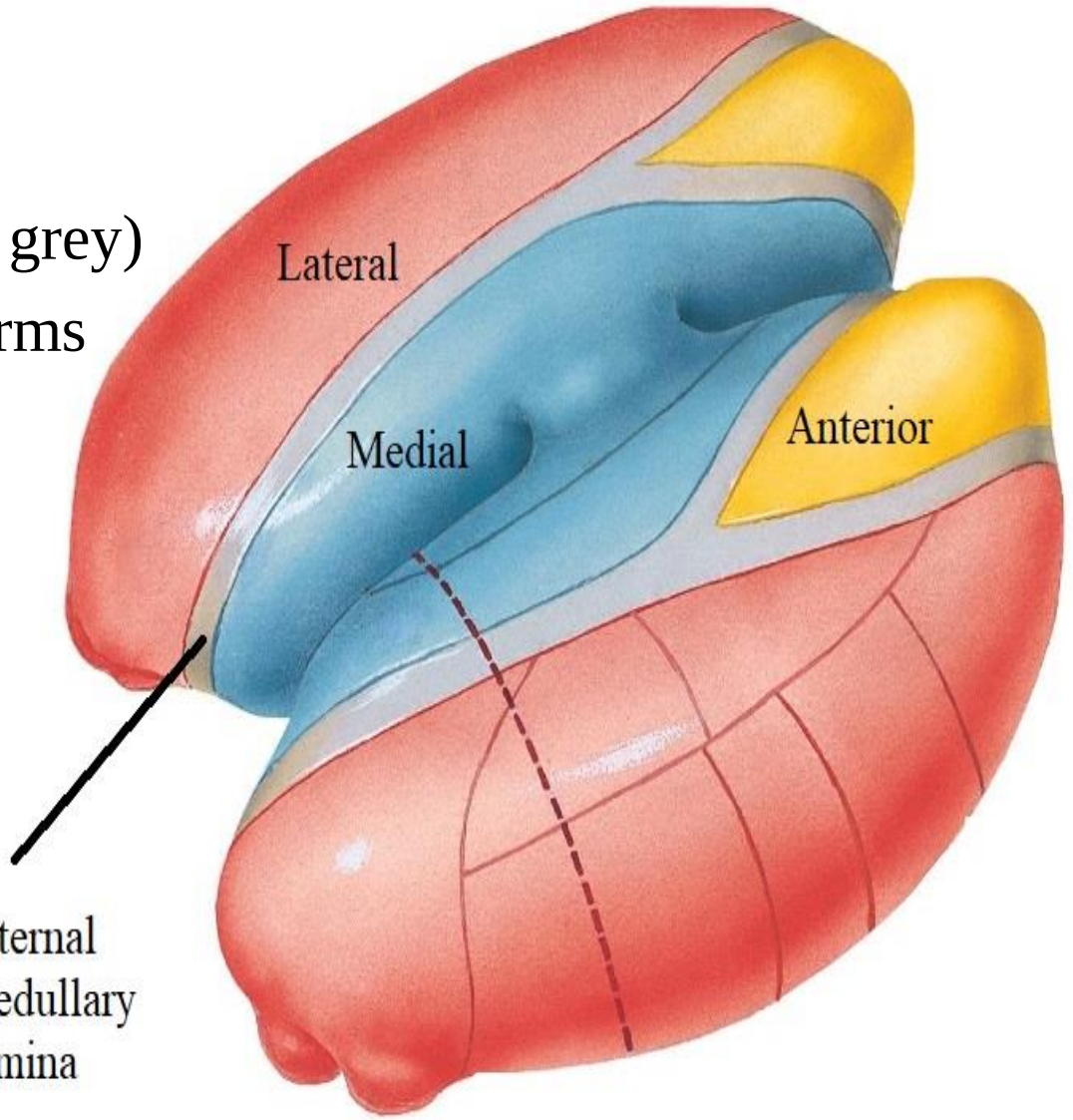
a-external medullary lamina:

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

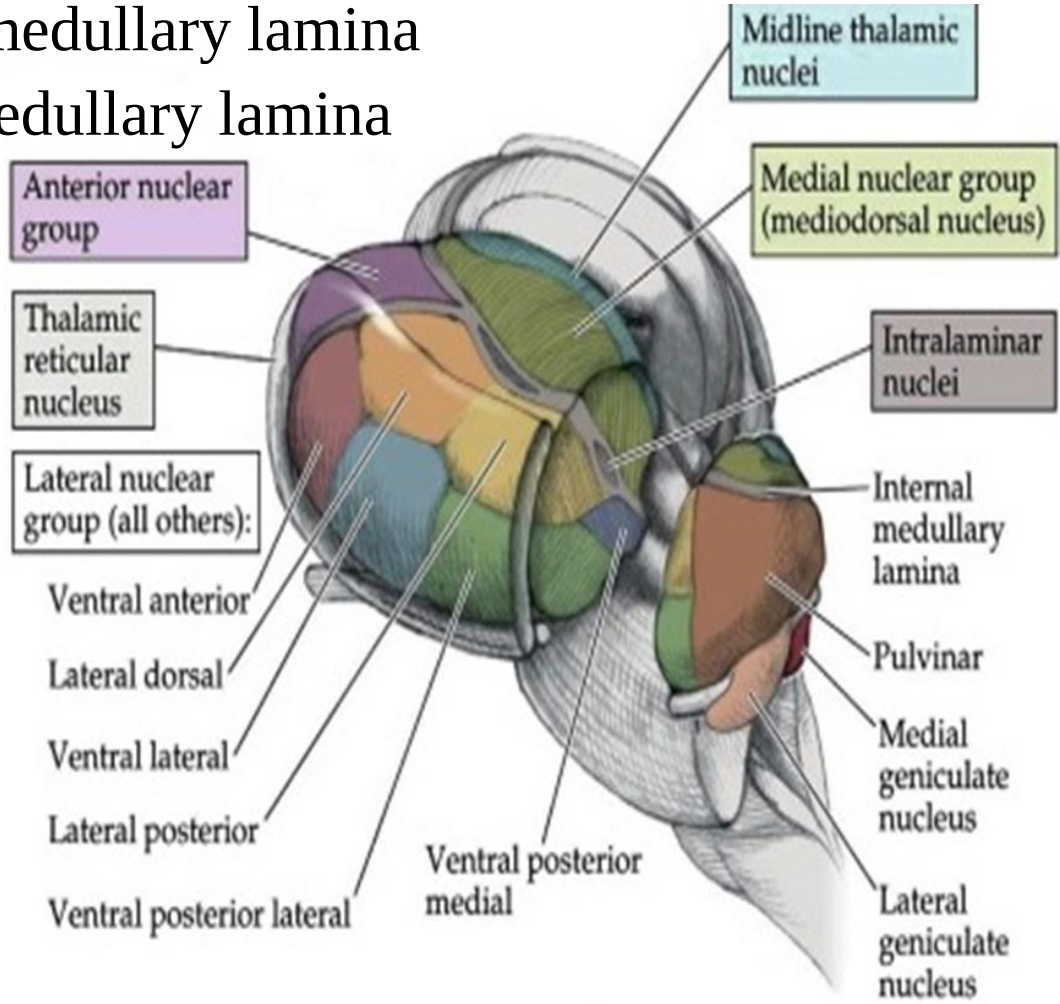
-ventral anterior (VA)

-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

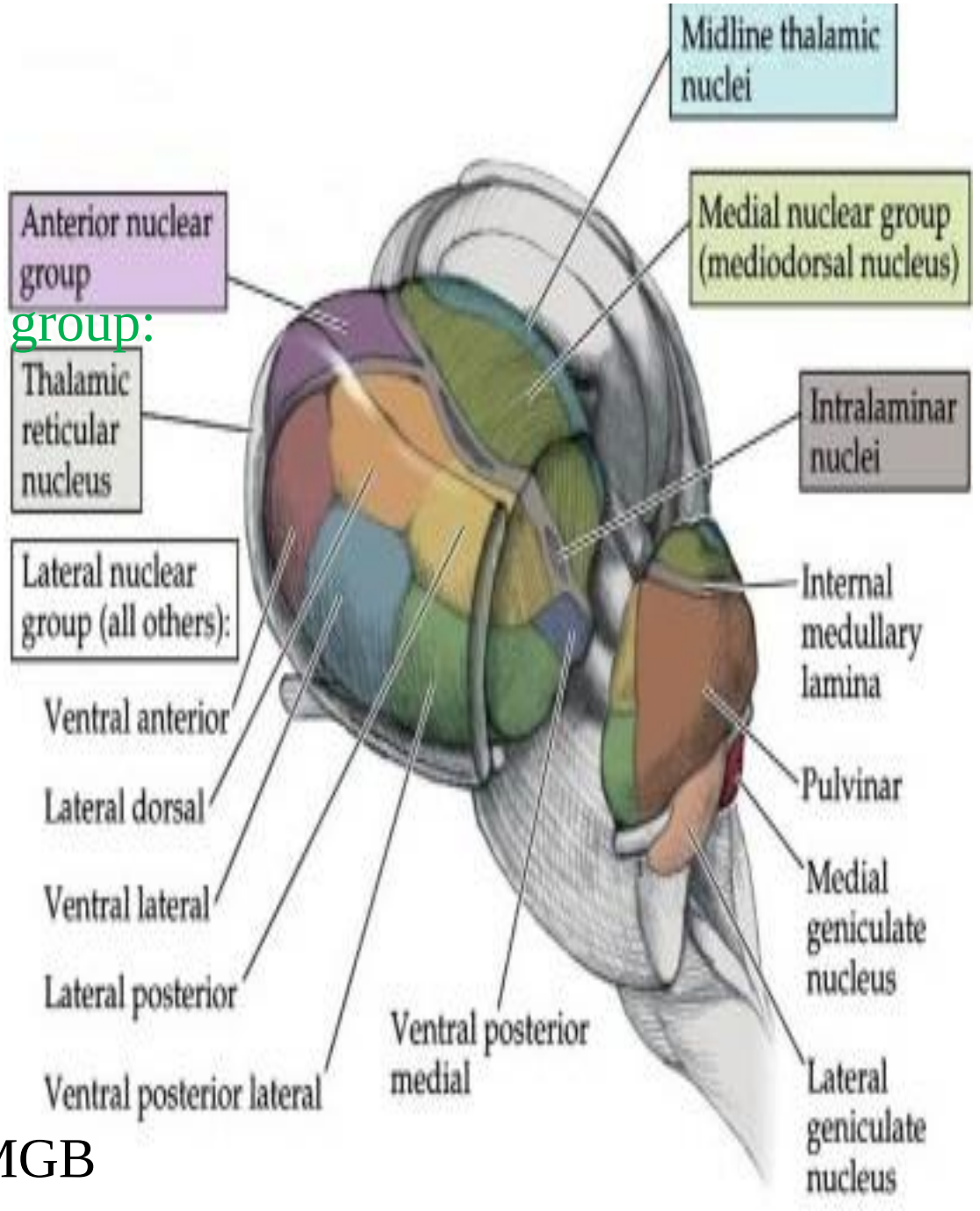
5-midline group:

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

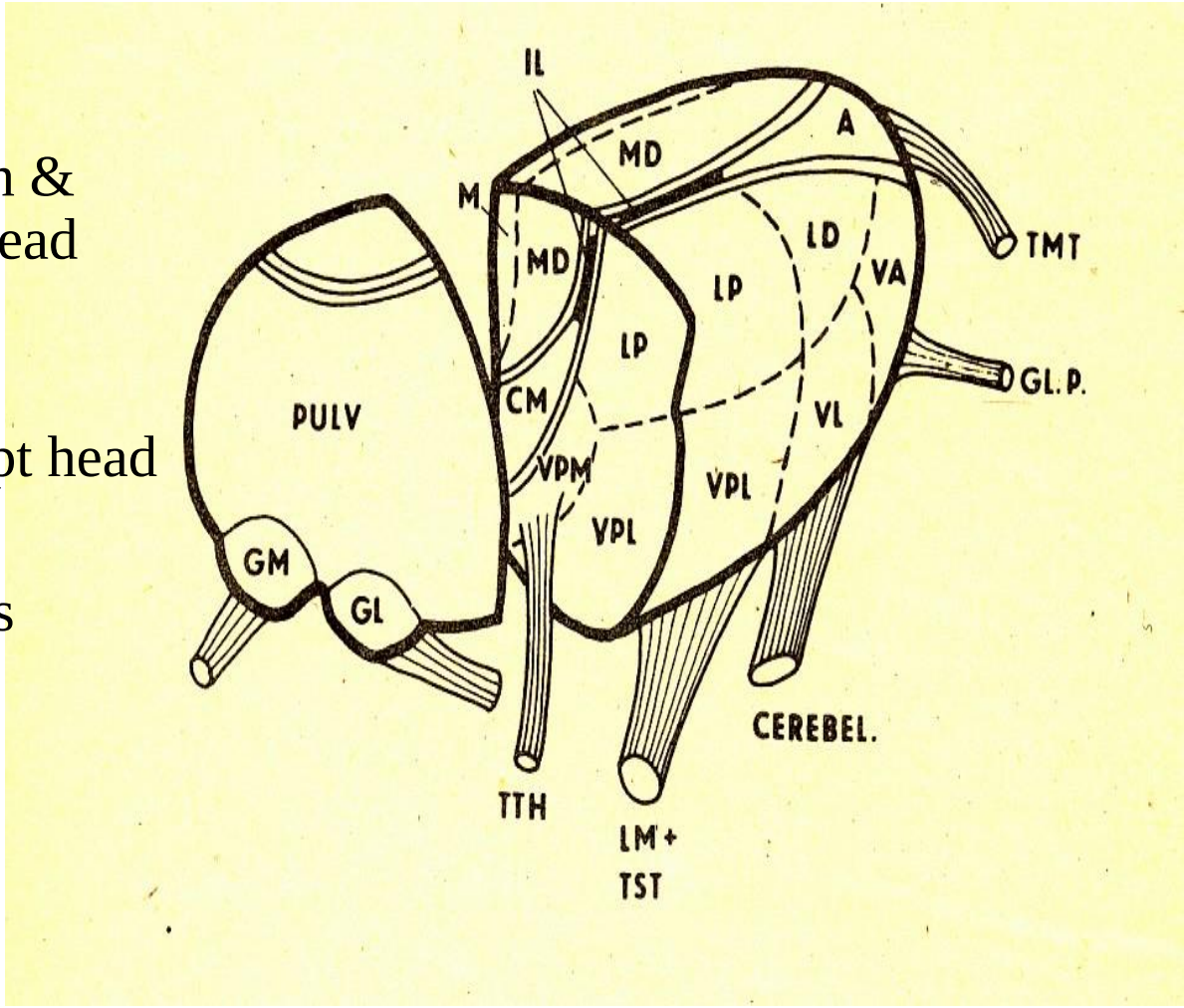
carry all mentioned sensations from head plus taste

-lateral lemniscus to MGB

carry hearing

-optic tract to LGB

carry vision



THALAMUS

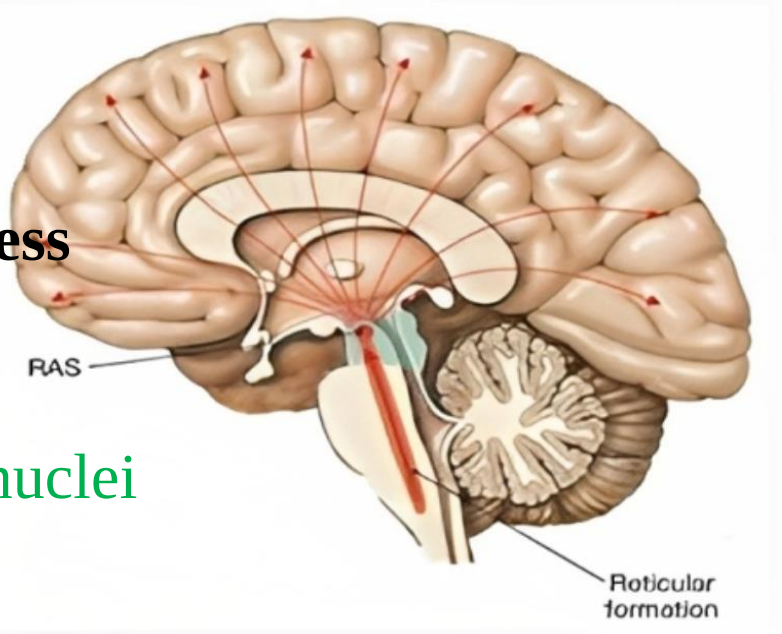
Functions & connections

2-maintenance of wakefulness & alertness

Afferents

-reticular formation nuclei (of same side)

to centromedian (intalaminar)&midline nuclei



3-emotional state & recent memory

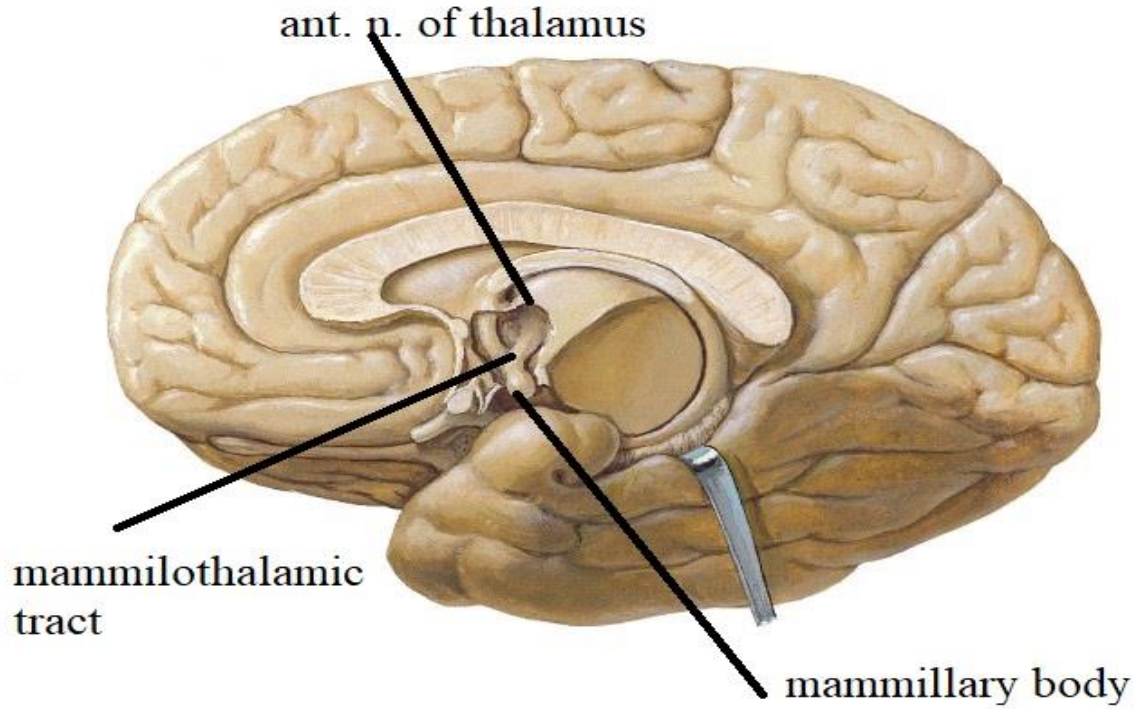
Afferents

Hypothalamus :-

mamillothalamic tract

from mammillary body

to ant. Nucleus



THALAMUS

Functions & connections

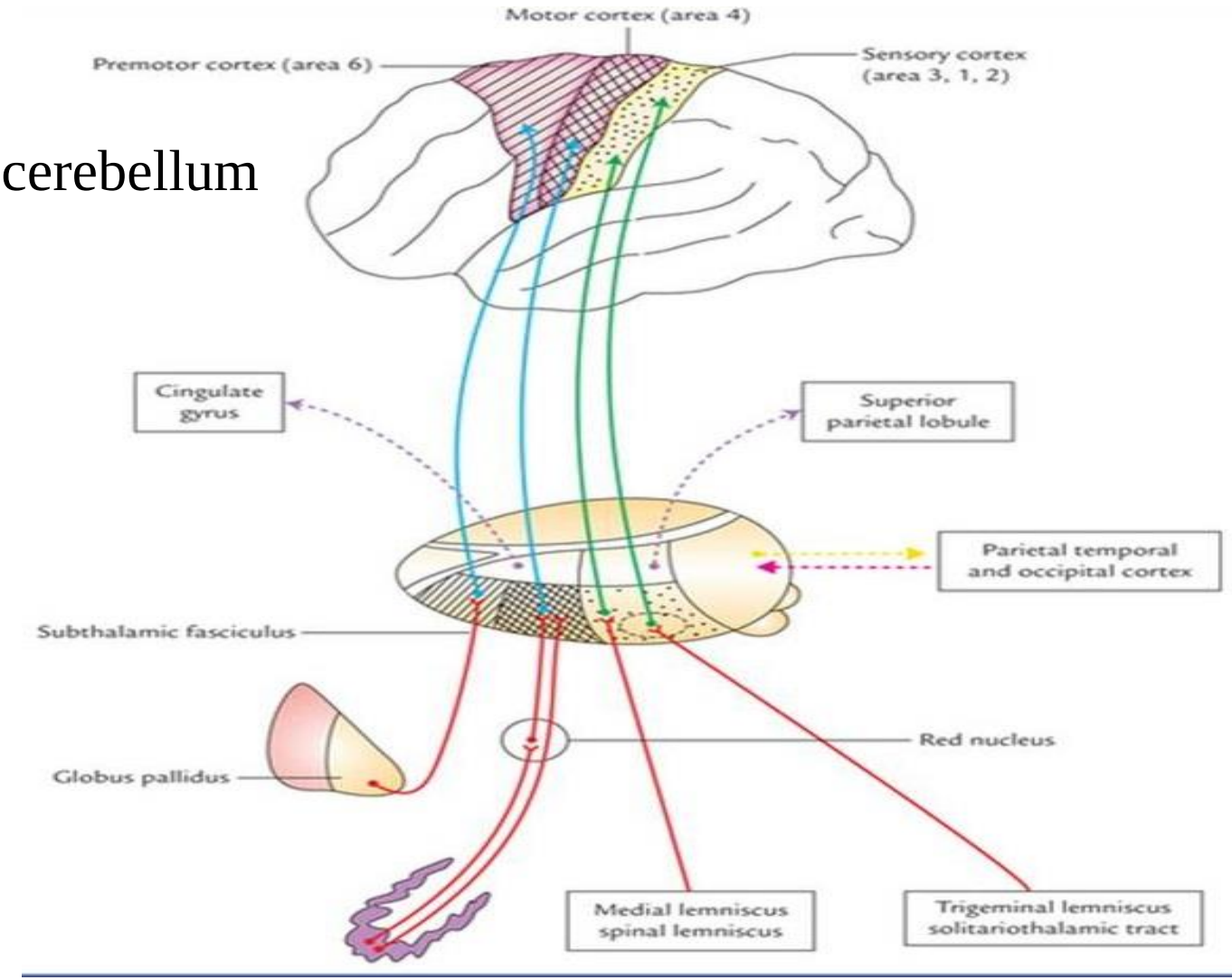
4- motor function as part of extrapyramidal system

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

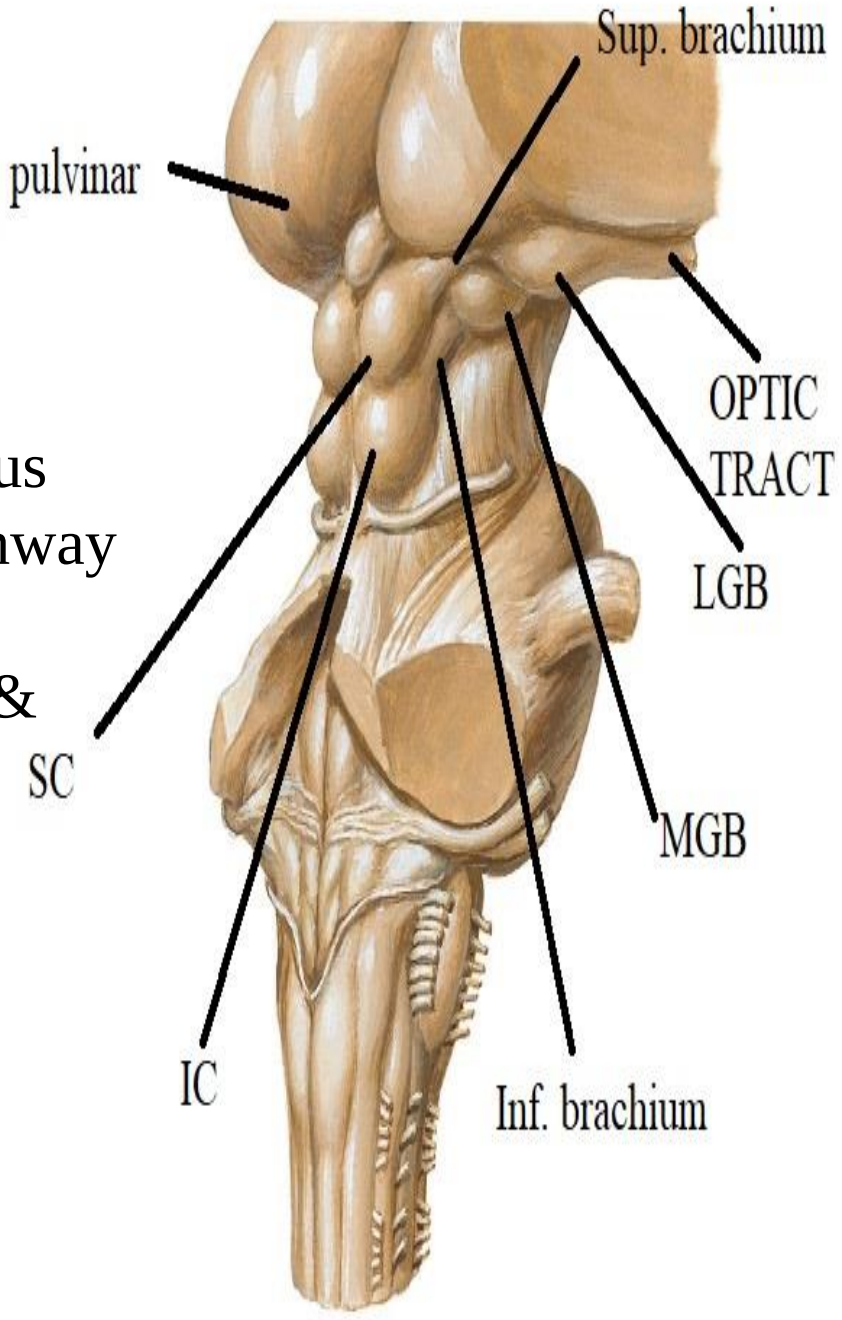
Medial geniculate body (MGB)

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

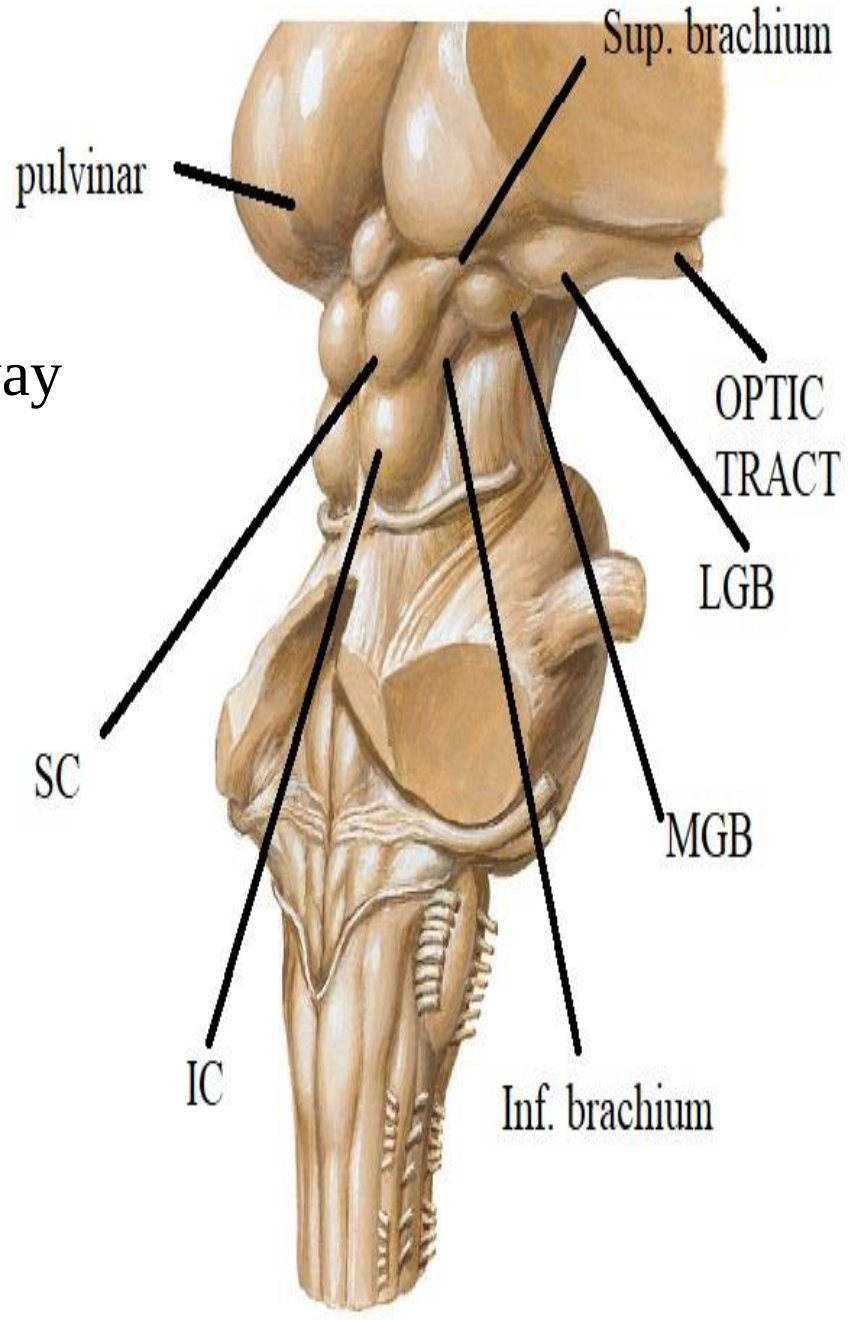
afferent:-visual fibers along the large lateral part of optic tract

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