

MIDBRAIN = MESENCEPHALON



Dr Nawal M Abdullah

OBJECTIVES:

- Describe gross anatomy of midbrain**
- Mention important structures at cross section**
- List important cranial nerves related**

Def:

upper part of brain stem that connect hind brain and forebrain.

*its cavity is called cerebral aqueduct which connect 3rd to 4th ventricle.

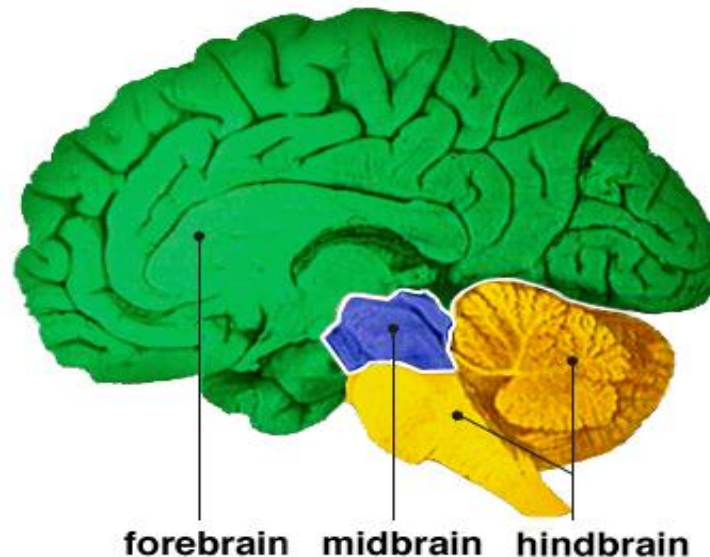
Passes through tentorial notch

Dimensions:

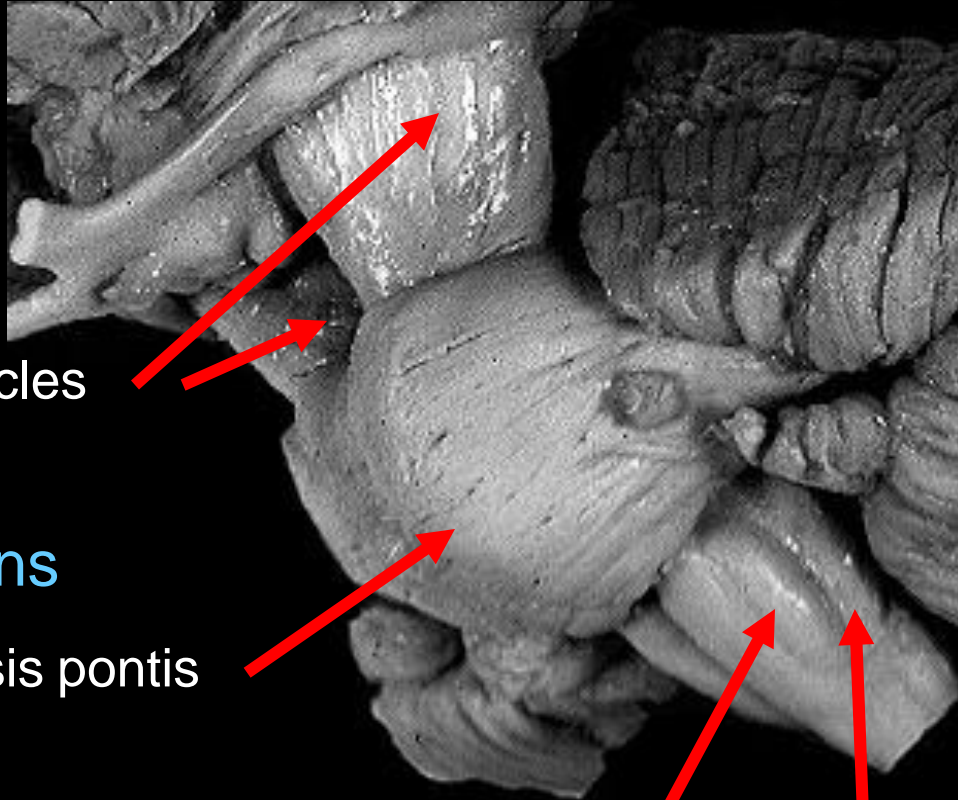
1 inch length,

1 inch breadth

TEXT 



Ventral – Lateral View



Midbrain

Cerebral peduncles

Pons

Basis pontis

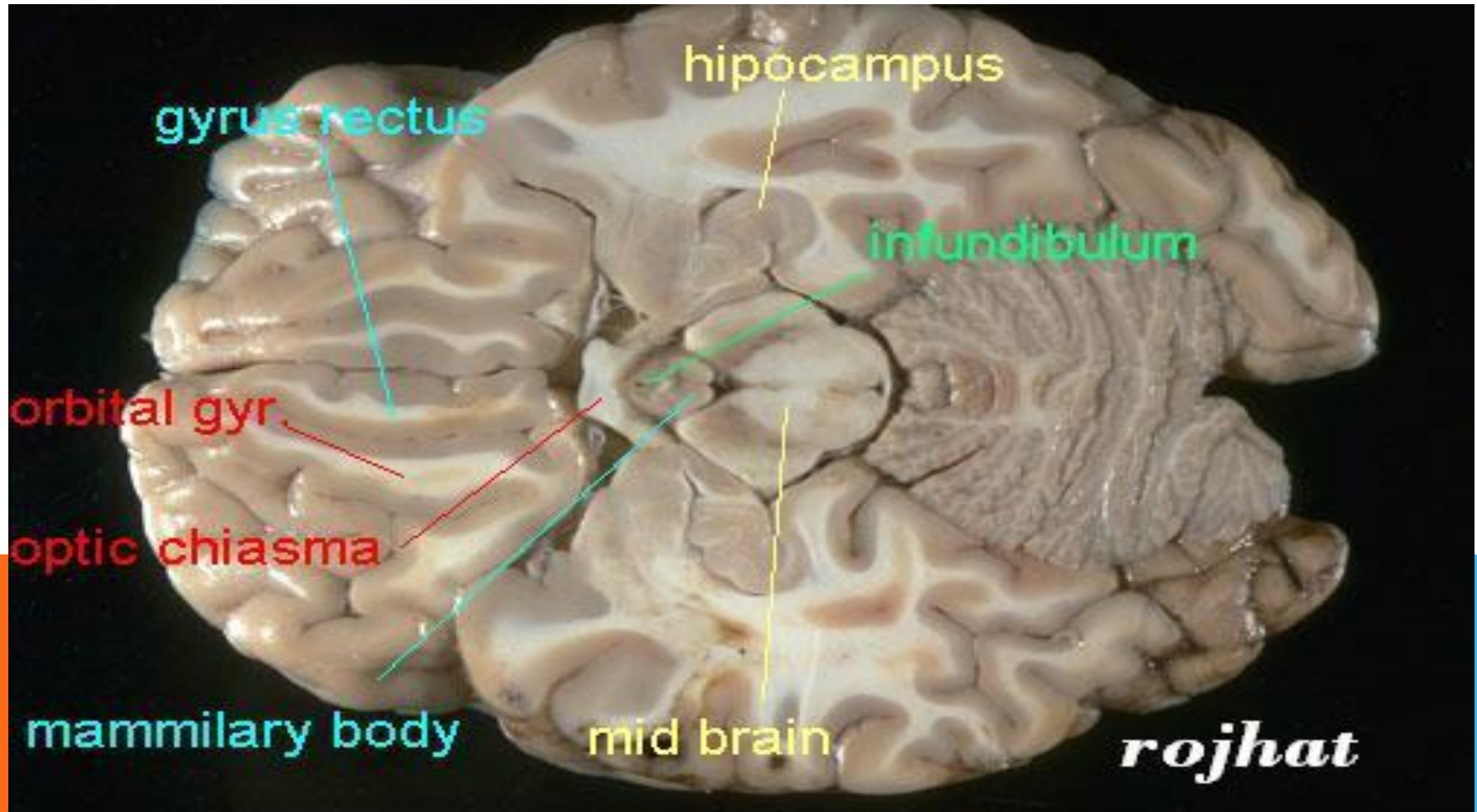
Medulla

Pyramid

Olive

Parts:

Looks like cube with 4 surfaces (ant, post, 2 lateral).



External features:

Anterior surface:

*****2 cerebral peduncles**

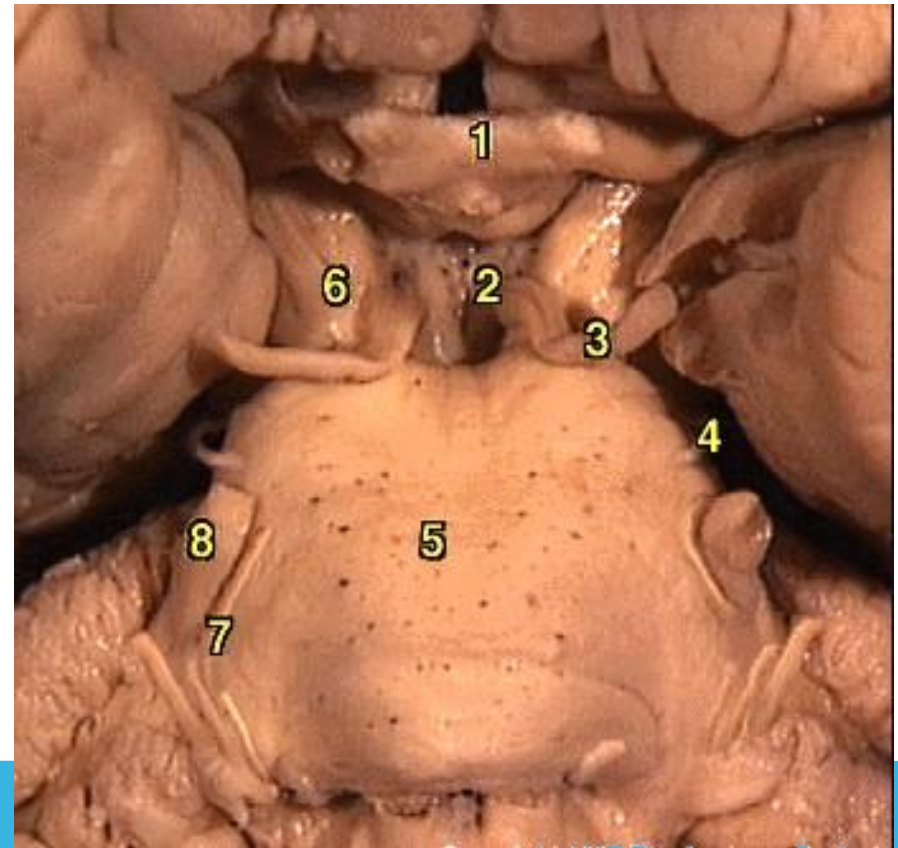
=i:e bundles of fibers that pass directly into anterior part of pons .

***** 2 oculomotor nerves**

emerge medial to cerebral peduncles in interpeduncular fossa.

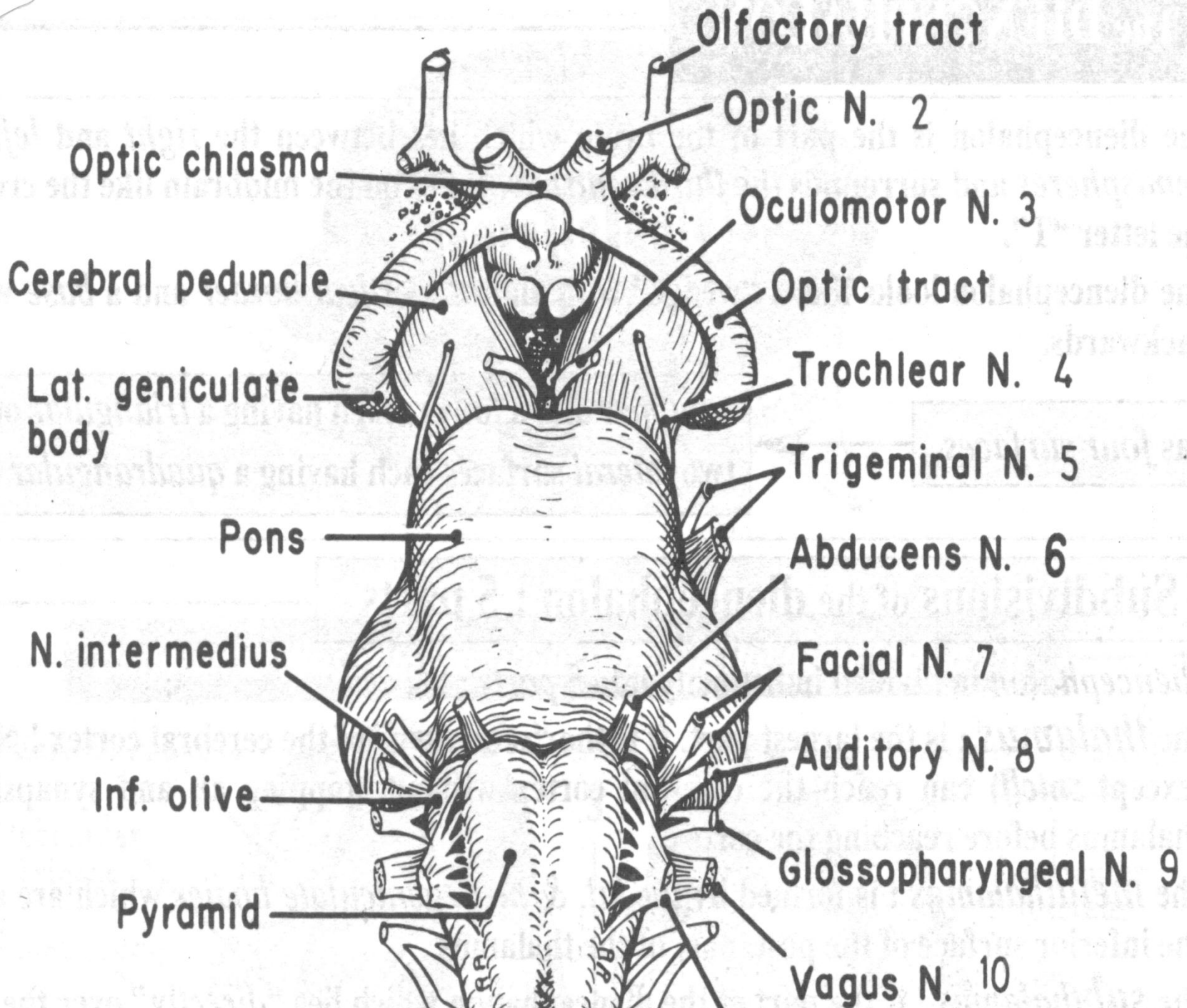
EXTERNAL STRUCTURE OF MIDBRAIN

- Optic chiasm
- Interpeduncular fossa
- Oculomotor nerve (CN III)
- Trochlear nerve (CN IV)
 - Pons
- Crus cerebri
(Cerebral peduncles)



Ventral surface

(anterior)



Lateral surface:

basis pedunculi = anteriorly **Crus cerebri**

Tectum = posteriorly

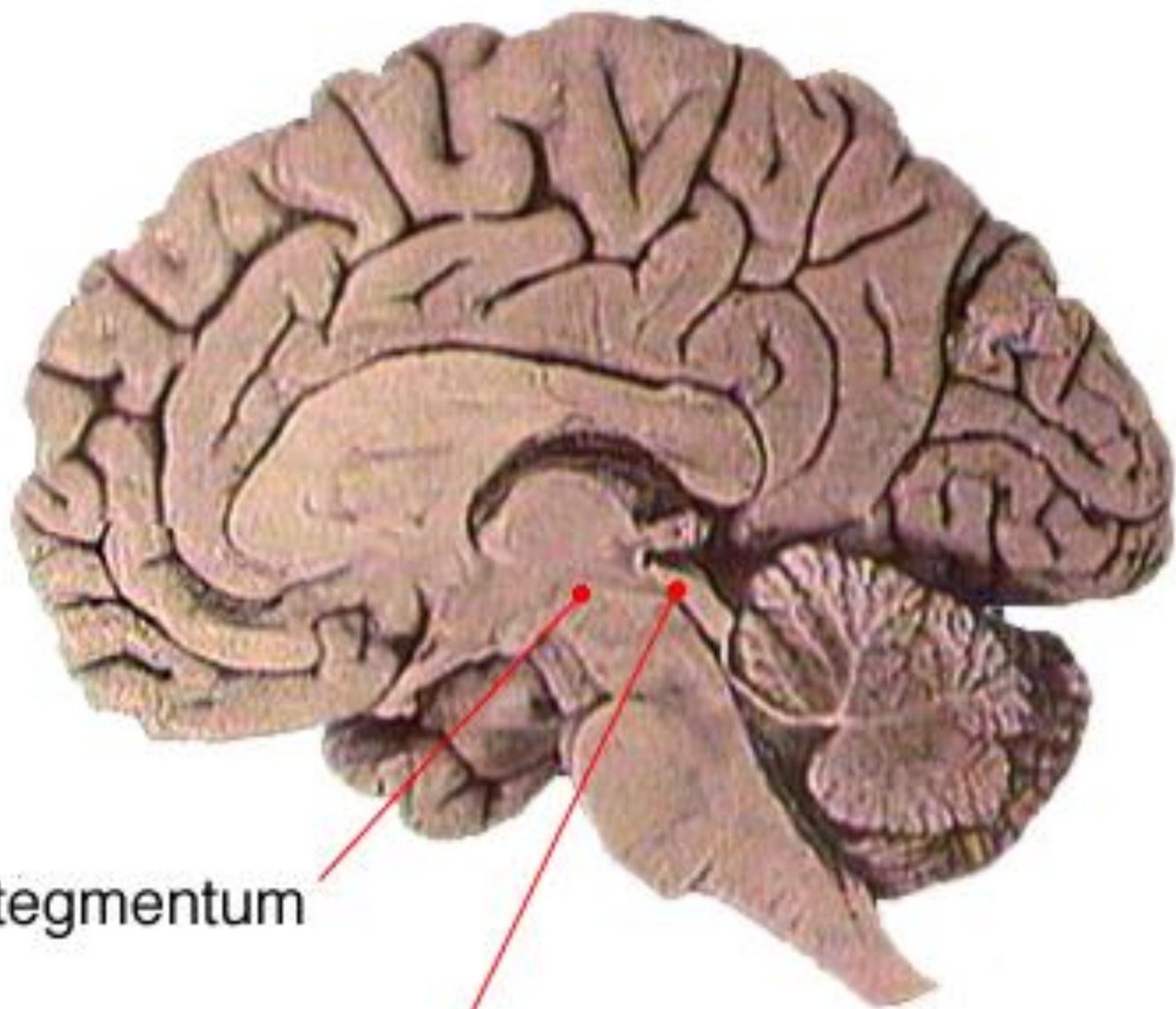
tegmentum = in the middle

*** 3 structures winds around lateral surface of midbrain ,

optic tract

trochlear nerve

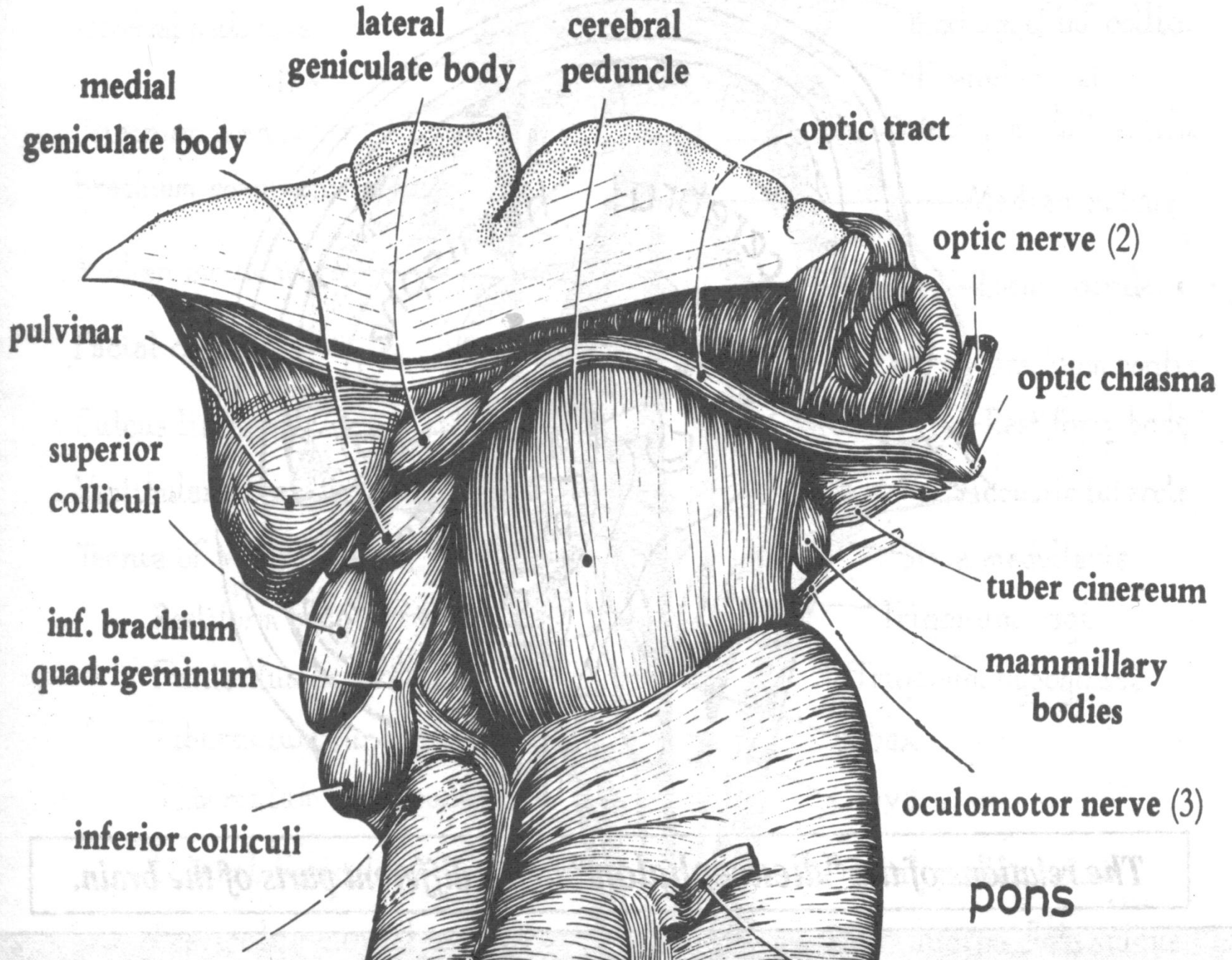
posterior cerebral artery



tegmentum

tectum





Posterior surface;

**Formed by tectum with 4 rounded elevations
called **colliculi****

2 superior colliculi

2 inferior colliculi.

*****trochlear nerve = smallest cranial
nerve .**

***** The only one which emerge
from dorsal surface behind
inferior colliculi.**

EXTERNAL SURFACE OF MIDBRAIN

Quadrigeminal Plate

- Superior colliculus •
- Inferior colliculus •

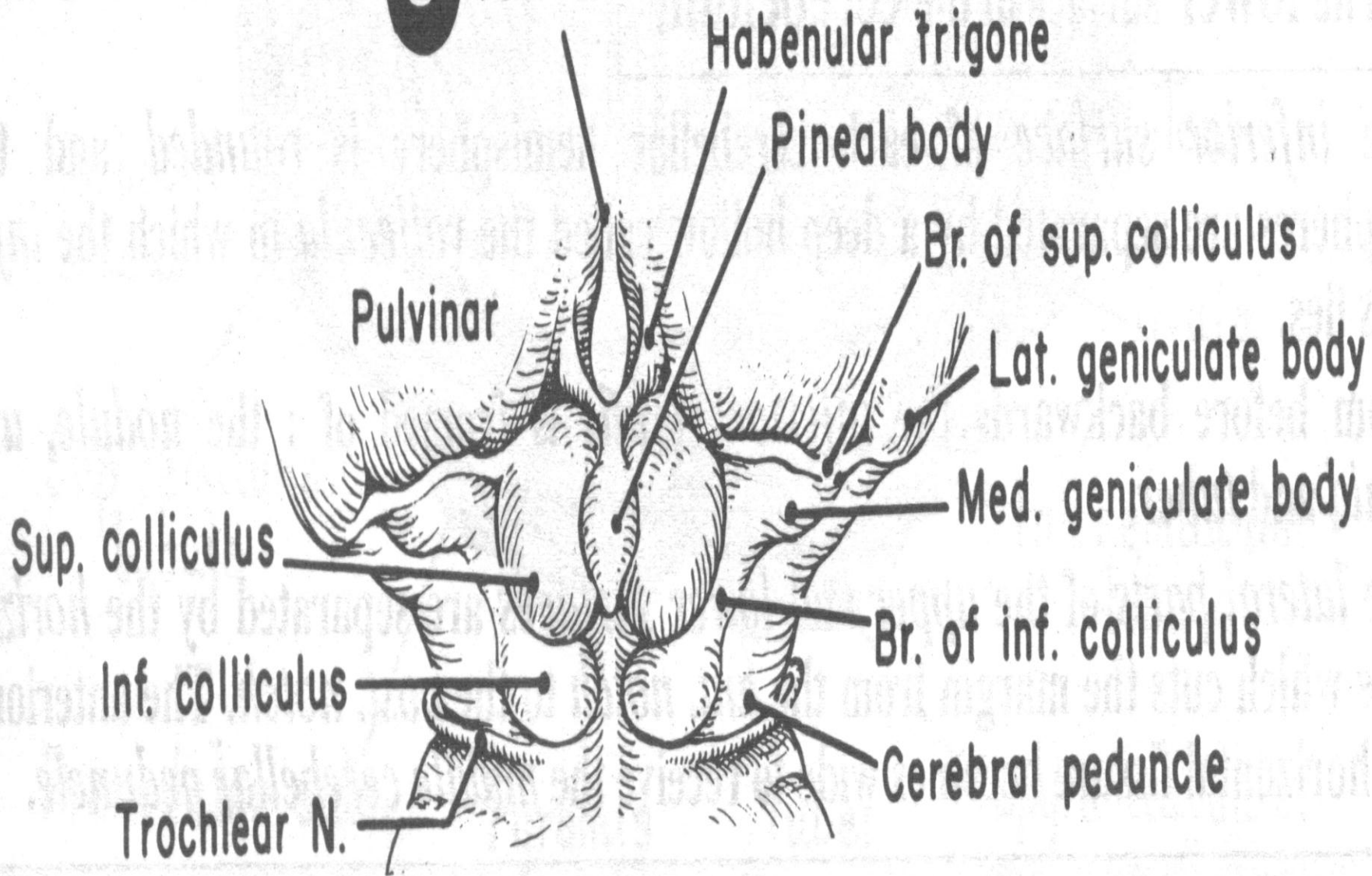


CN IV
Trochlear nerve



Dorsal surface
Cerebellum removed

3 Ventricle

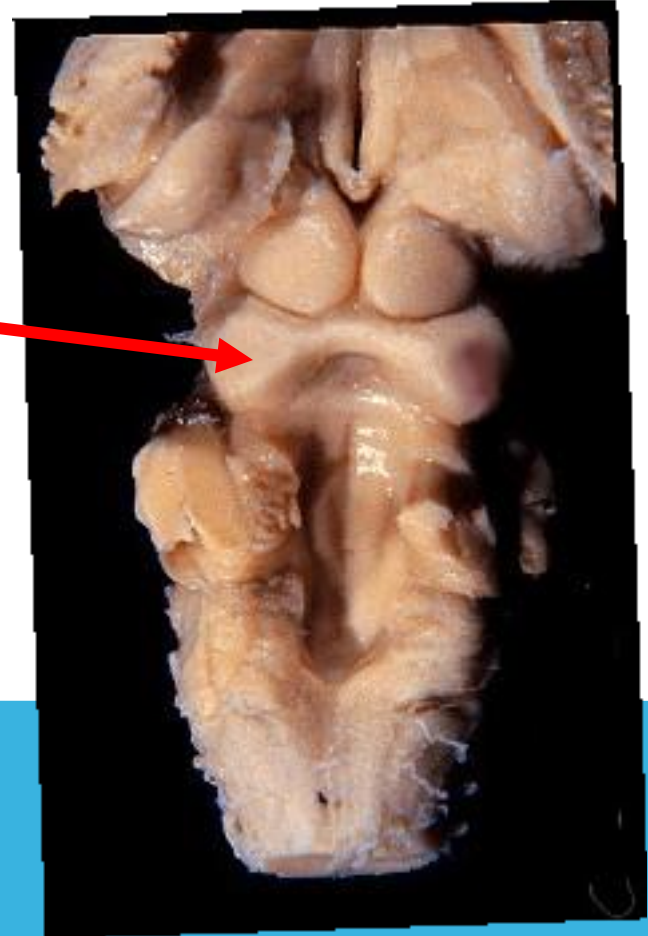


INTERNAL STRUCTURE OF MIDBRAIN

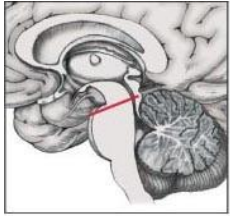
Cross section at two levels

inferior colliculus

superior colliculus

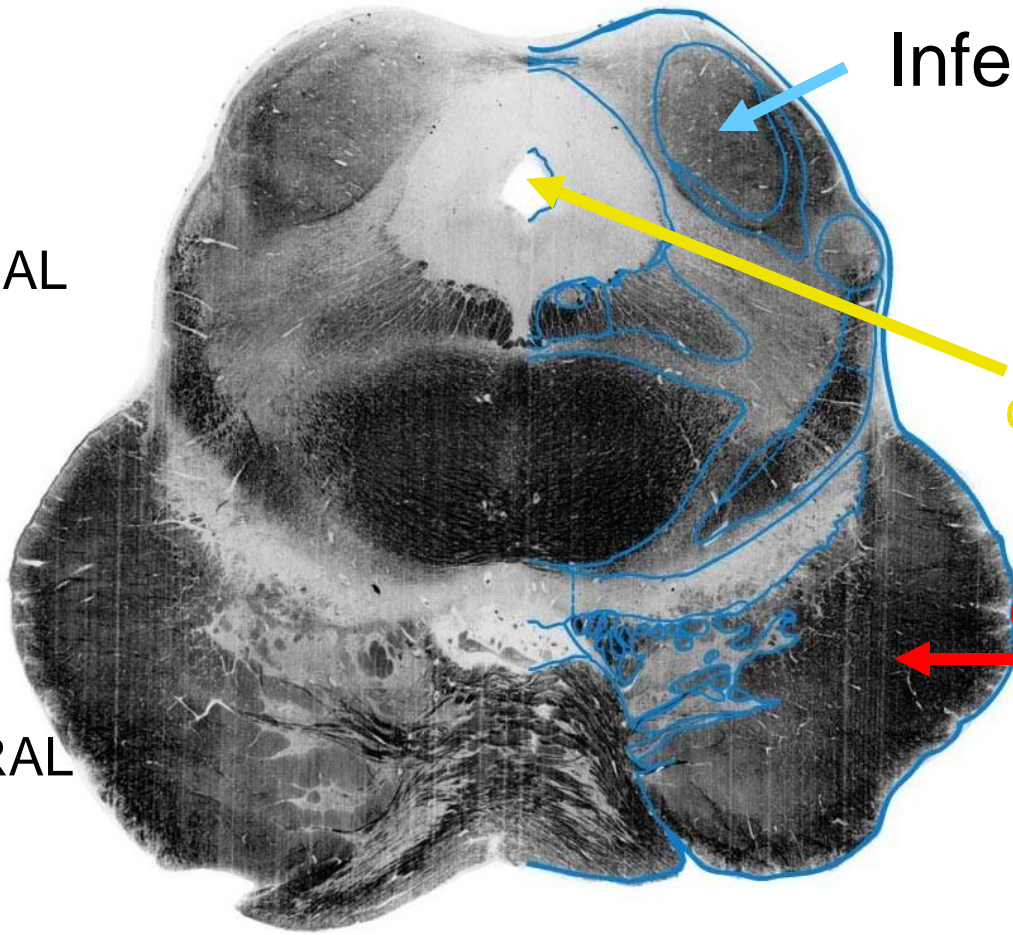


LOWER MIDBRAIN



DORSAL

VENTRAL

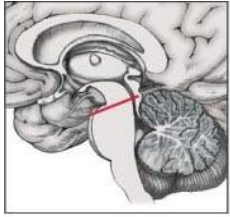


Inferior colliculus

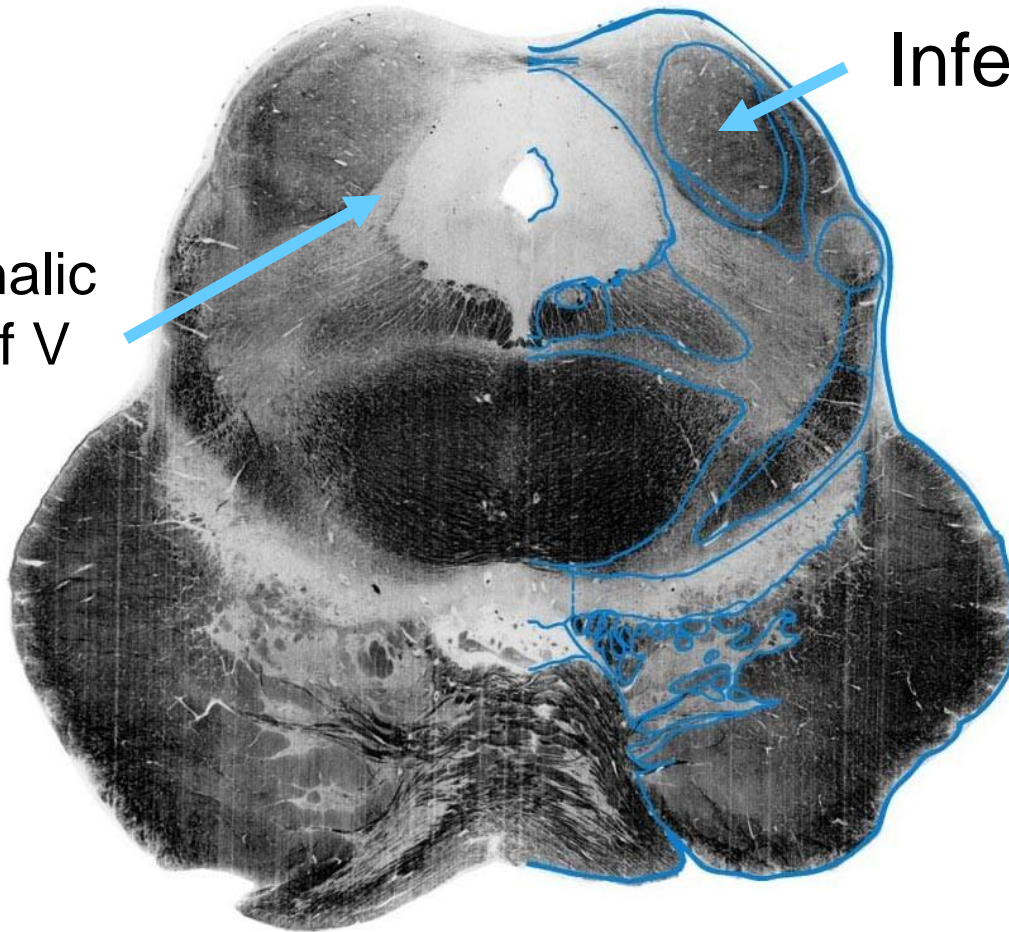
cerebral aqueduct

cerebral peduncles

LOWER MIDBRAIN



Mesencephalic nucleus of V



Inferior colliculus

INTERNAL STRUCTURE OF MIDBRAIN

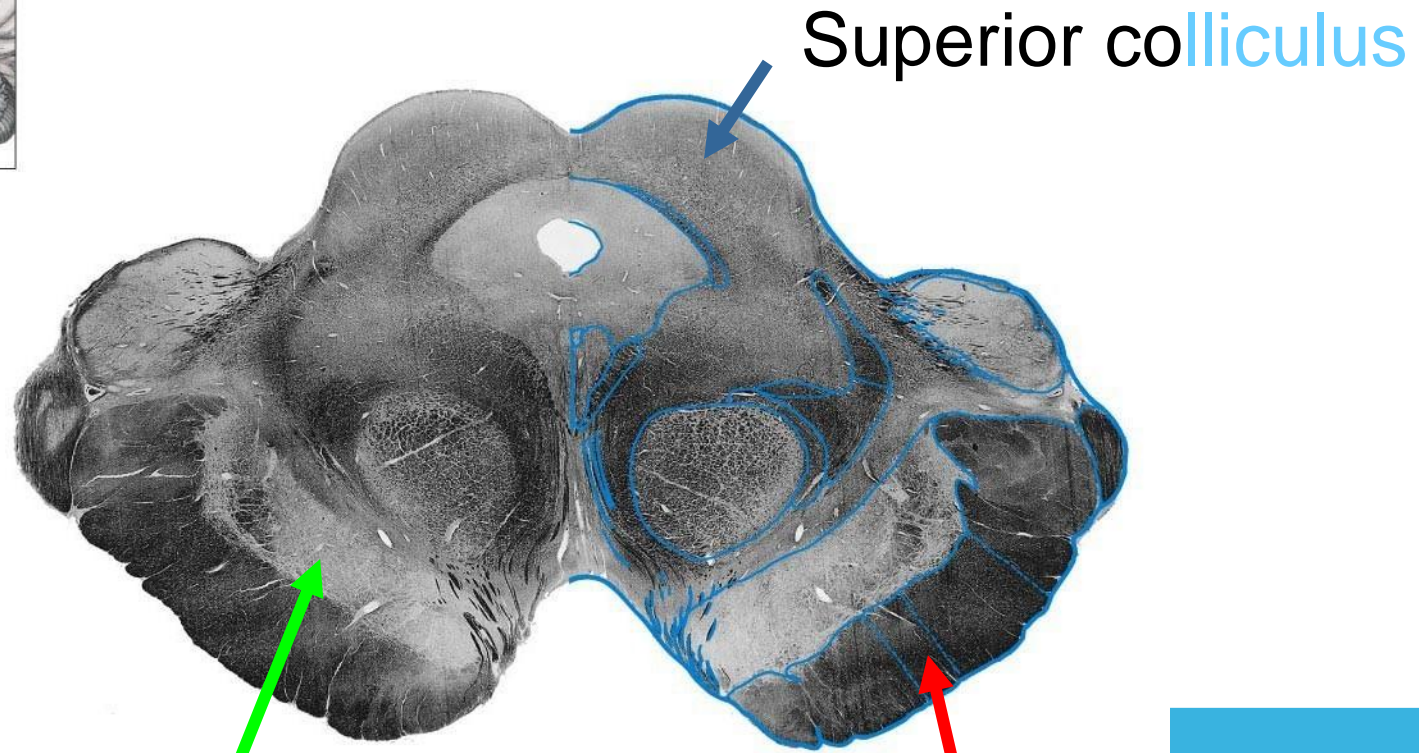
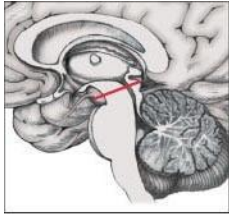
Cross section at two levels

inferior colliculus

superior colliculus



U PPER M IDBRAIN



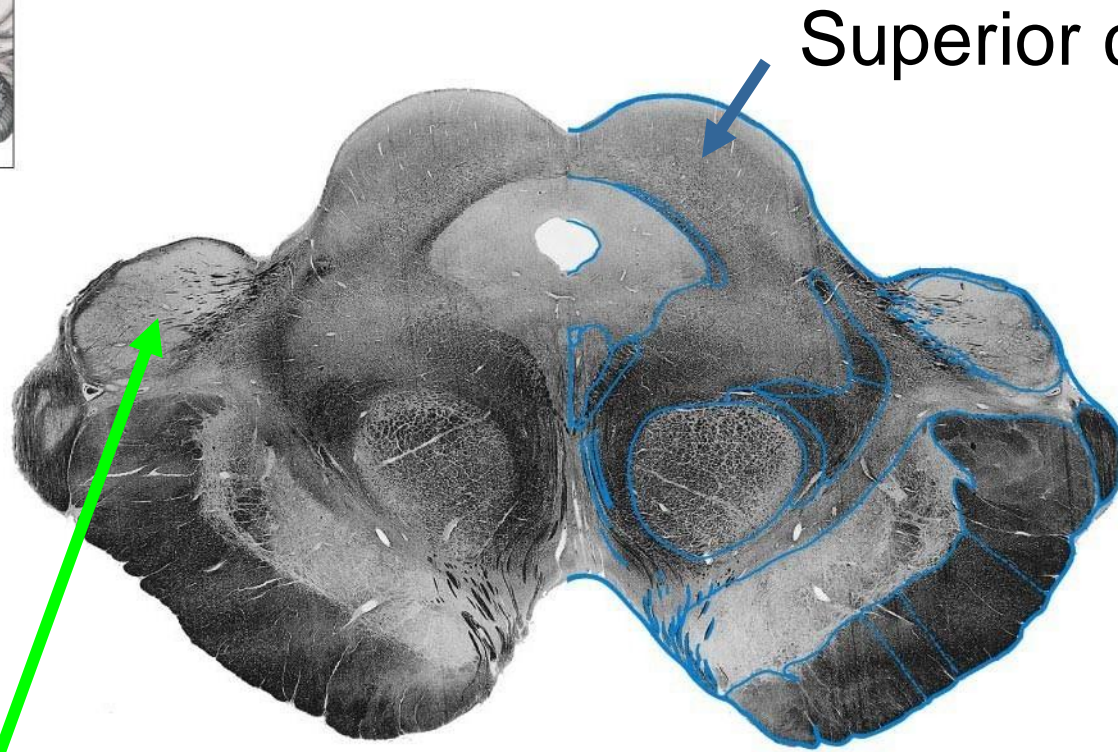
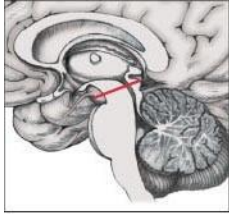
Superior colliculus

Substantia nigra

Crus cerebri
(cerebral

(peduncle

U PPER M IDBRAIN



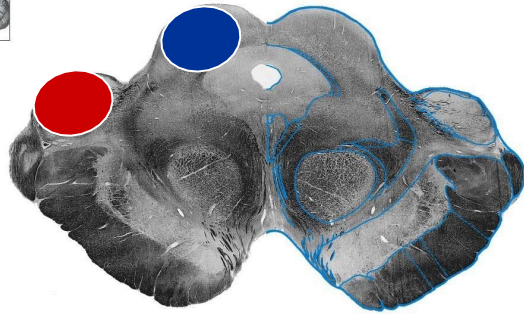
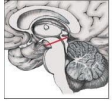
Superior colliculus

vision

Medial geniculate body

hearing

U PPER M IDBRAIN

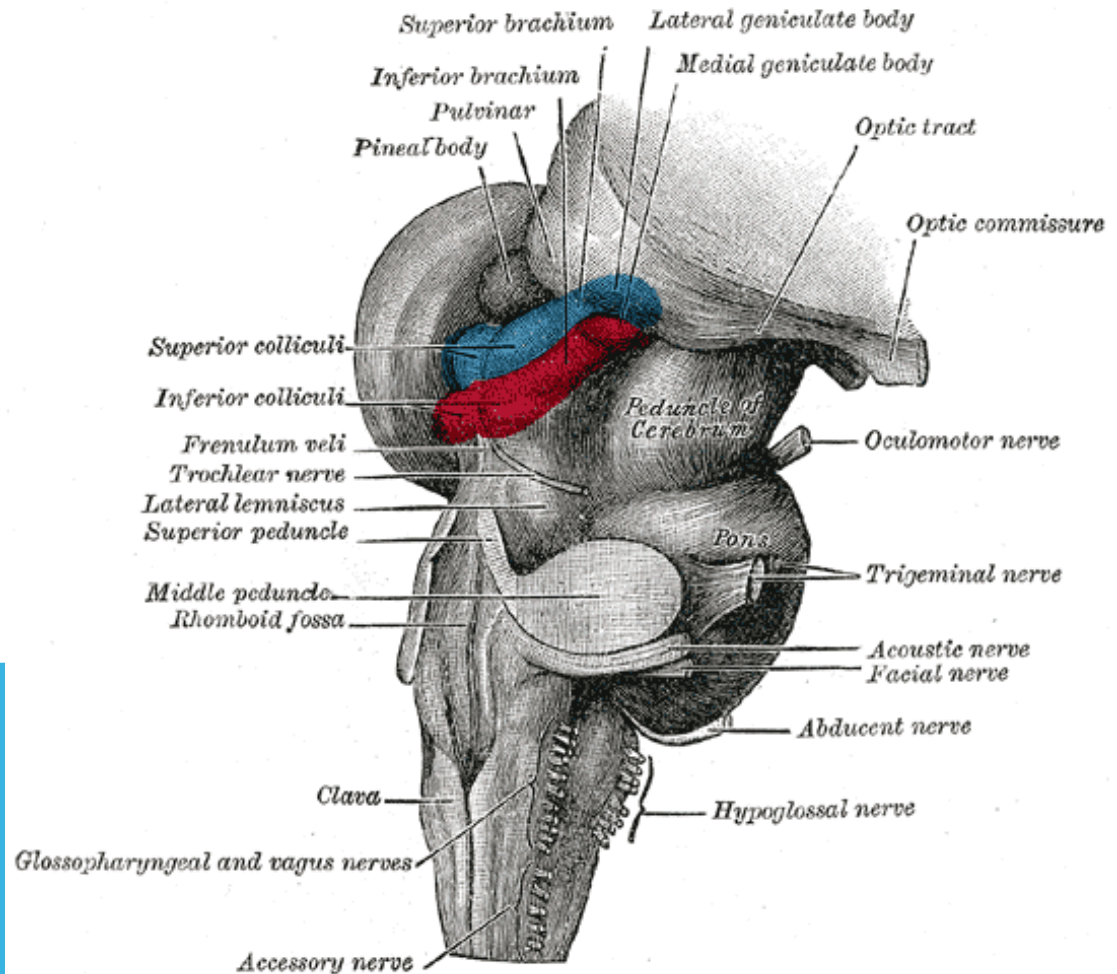


Vision

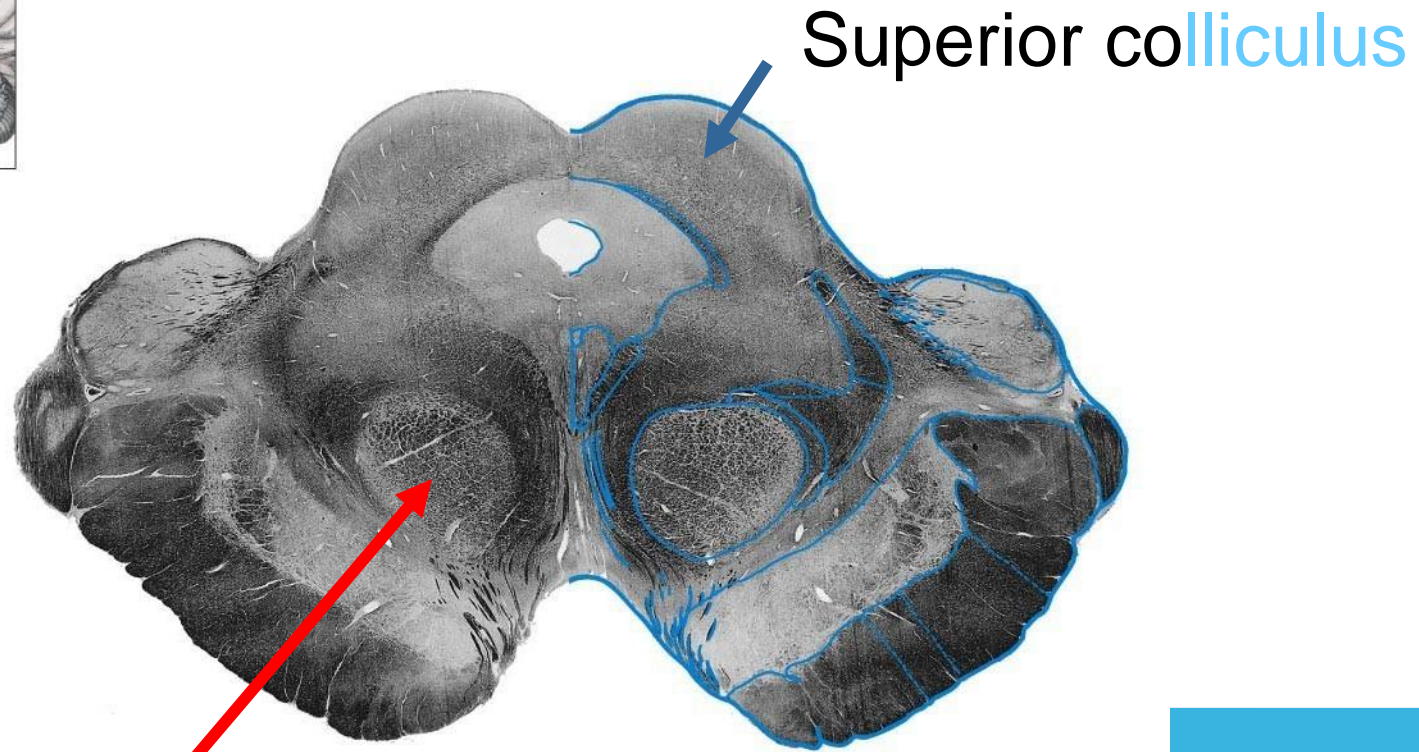
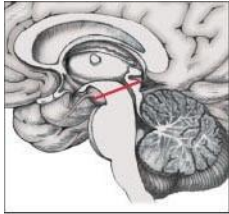


Hearing

Inferior colliculus →
Medial geniculate body



U PPER M IDBRAIN

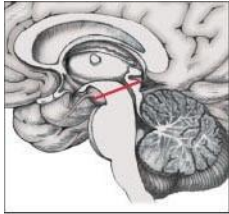


Red nucleus –

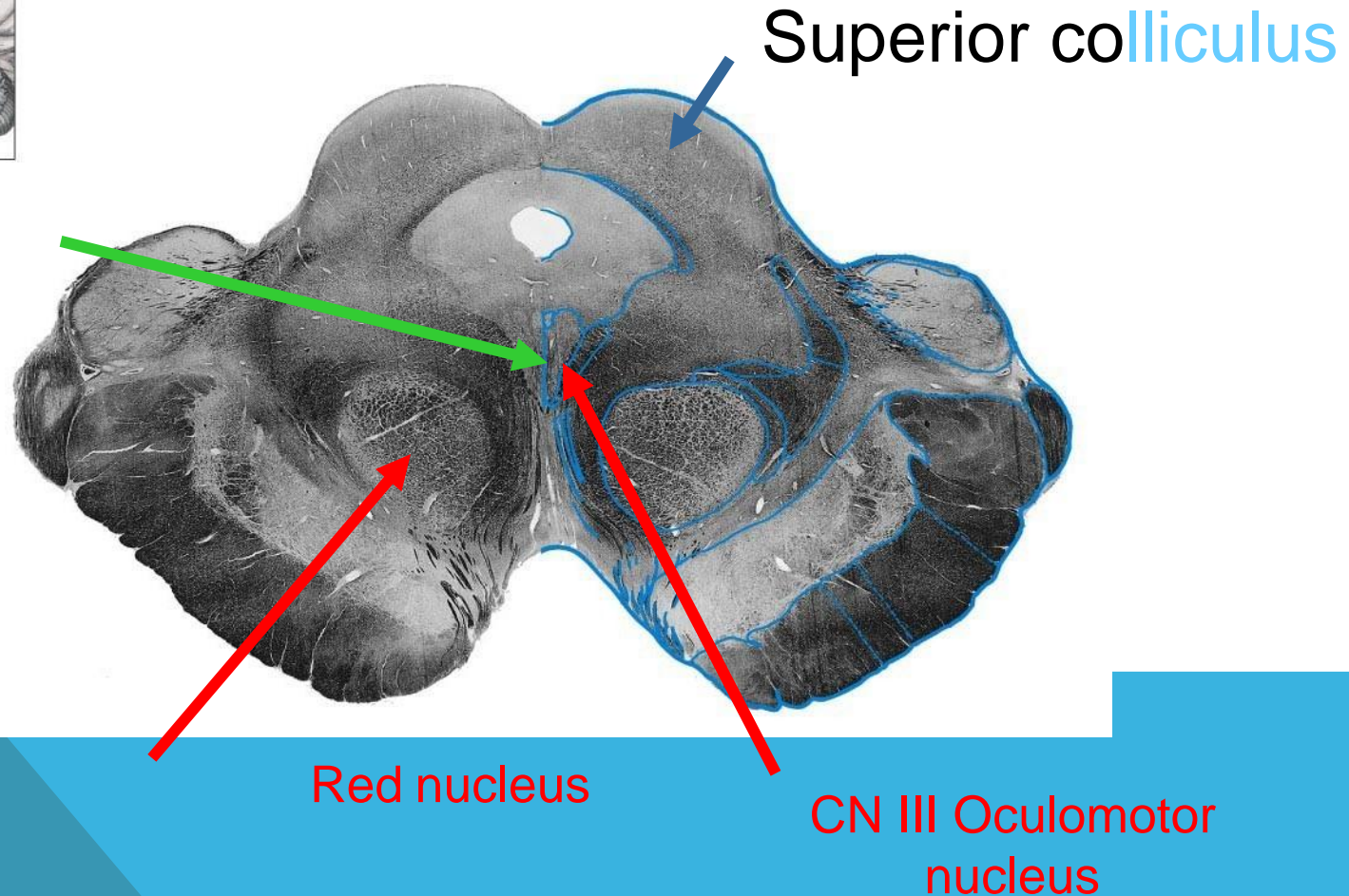
relay from cortex and cerebellum to spinal cord, inferior olive, reticular formation, cerebellum

Controls arm movement

CRANIAL NERVES AT UPPER MIDBRAIN



Edinger Westfal
nucleus

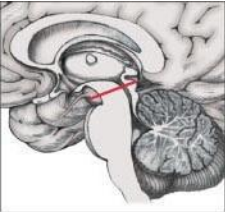


Superior colliculus

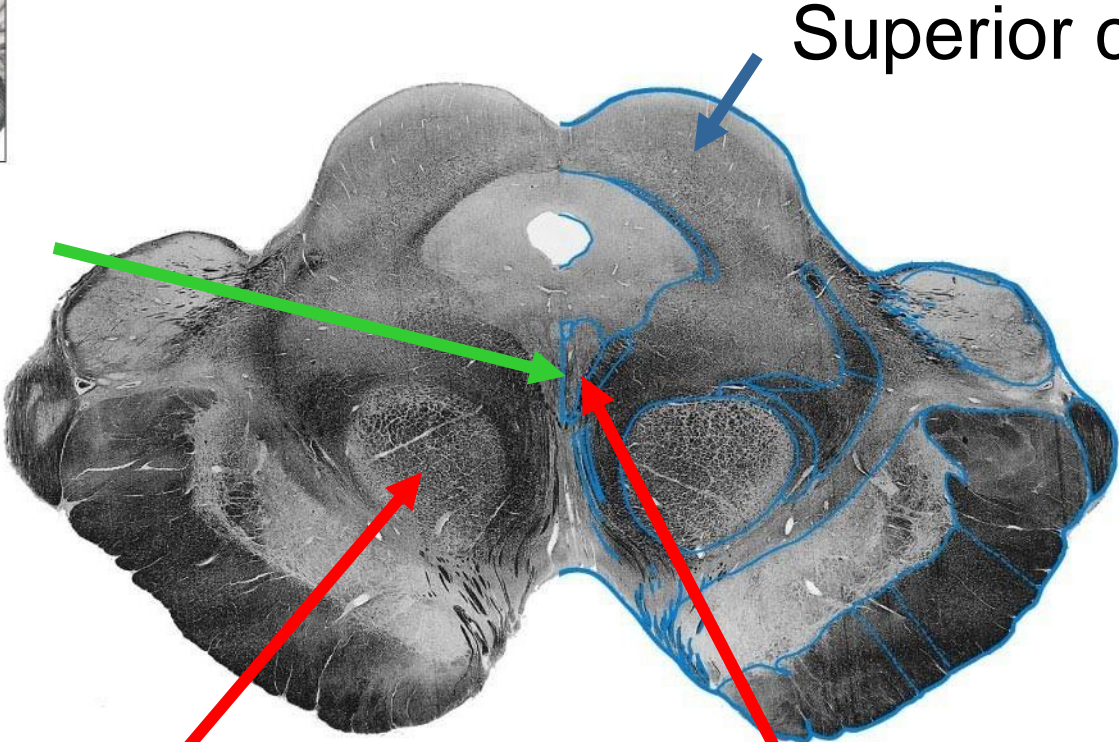
Red nucleus

CN III Oculomotor
nucleus

UPPER MIDBRAIN



Edinger Westfal nucleus



Superior colliculus

Red nucleus

CN III Oculomotor nucleus

APPLIED ANATOMY

TRAUMATIC INJURY

*Midbrain ascends through small rigid opening in tentorium cerebelli and is vulnerable to traumatic injury. It is the more common site for tumors, hemorrhage or infarcts.

*Blockage of cerebral aqueduct

Cavity of midbrain, cerebral aqueduct is prone for blockage due to tumor of midbrain or tumor outside midbrain and produce hydrocephalus and produce signs and symptoms specific for oculomotor and trochlear nerve nuclei, together with descending corticospinal and corticonuclear tracts features.

VASCULAR SYNDROME OF MIDBRAIN

*Weber's Syndrome. Benedikt's
syndrome. Claude's syndrome.*

*Northangel's Syndrome. Parinaud
syndrome.*

A 'Top of the basilar' syndrome.

A caudal paramedian midbrain syndrome.