Understanding & Assessing Visual Deficits in Strokes

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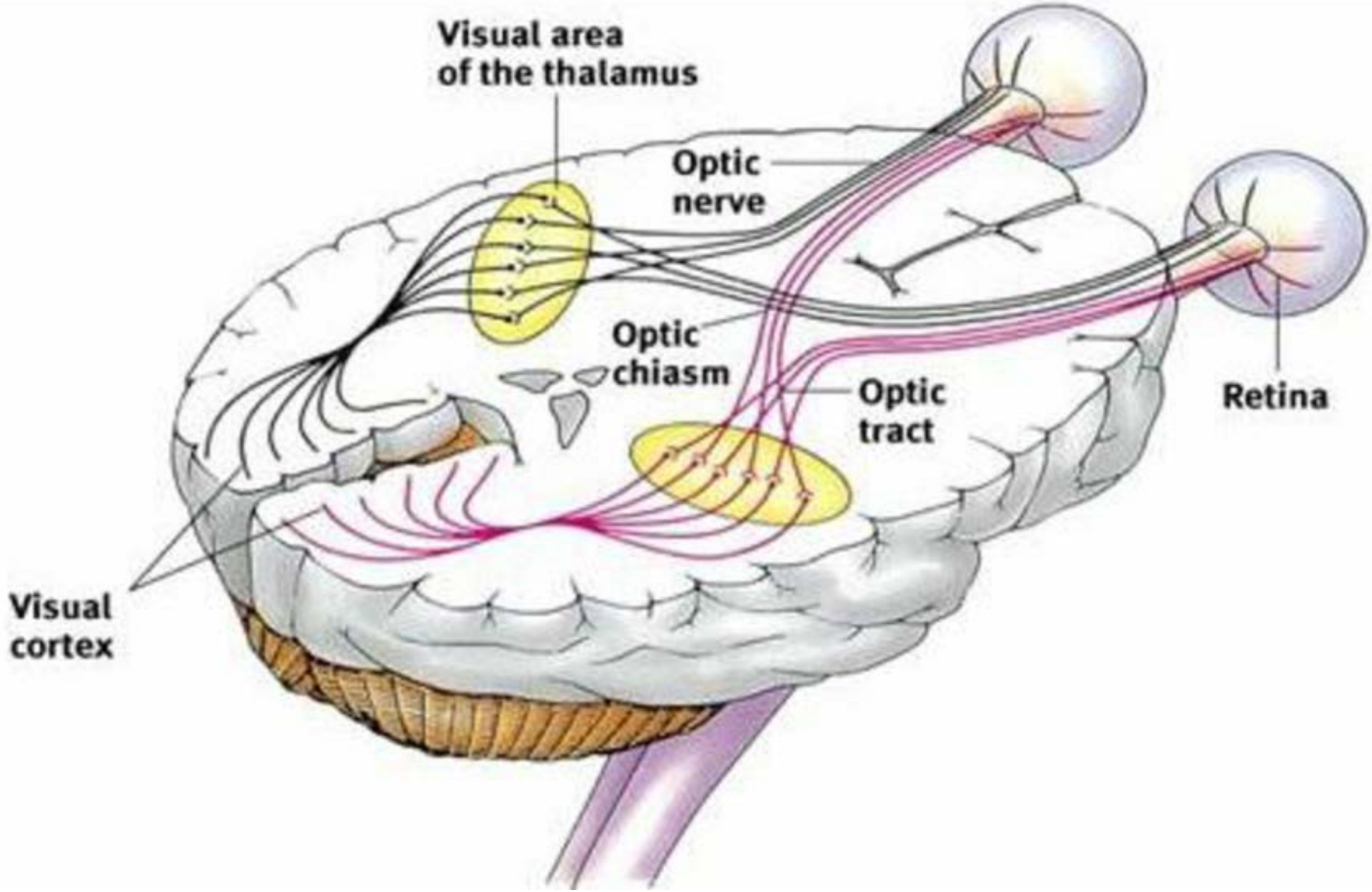
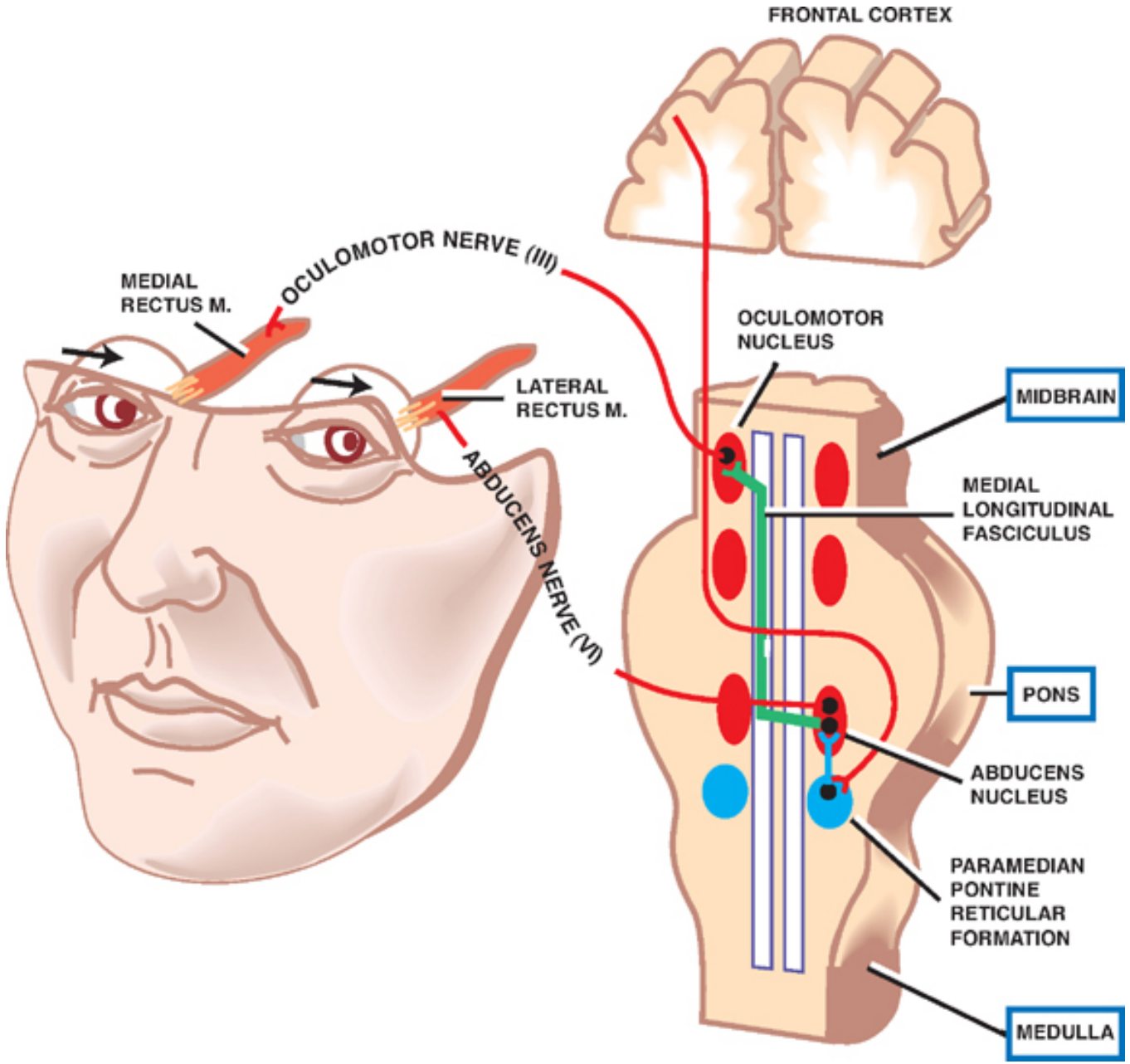
MOSAIC Workshop

No financial disclosures

Objectives

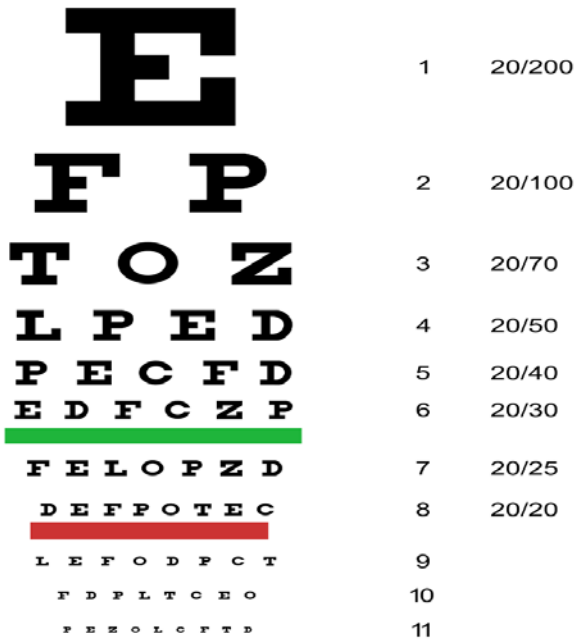
- ❑To evaluate abnormalities in visual field in acute strokes
- ❑To assess pupillary dysfunction in acute strokes
- ❑To assess eye movement issues in acute strokes
- ❑To assess eyelid droop in acute strokes

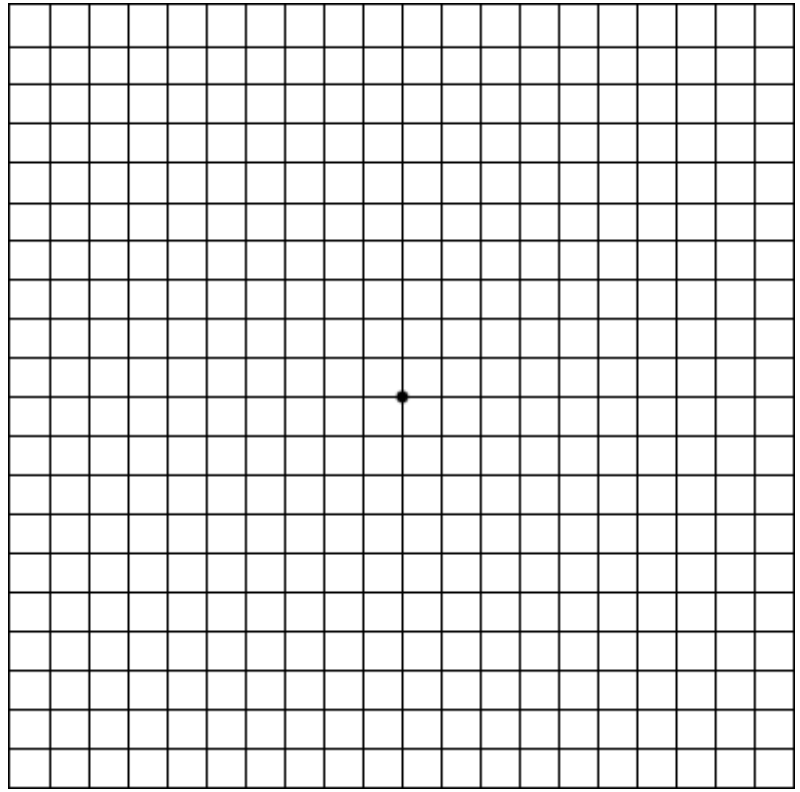

Visual area
of the thalamus
Optic
nerve
Optic
chiasm
Optic
tract
Retina
Visual
cortex


FRONTAL CORTEX
MEDIAL RECTUS M.
OCULOMOTOR NERVE (III)
LATERAL RECTUS M.
ABDUCENS NERVE (VI)
OCULOMOTOR NUCLEUS
MIDBRAIN
MEDIAL LONGITUDINAL FASCICULUS
PONS
ABDUCENS NUCLEUS
PARAMEDIAN PONTINE RETICULAR FORMATION
MEDULLA

- ❑Decrease vision
- ❑Double vision
- ❑Ptosis
- ❑ Nystagmus and othe


PELICAN™ 1920


E
F P
T O Z
L P E D
P E C F D
E D F C Z P
F E L O P Z D
D E F P O T E C
L E F O D P C T
F D P L T C E O
P E Z O L C F T D
1 20/200
2 20/100
3 20/70
4 20/50
5 20/40
6 20/30
7 20/25
8 20/20
9
10
11

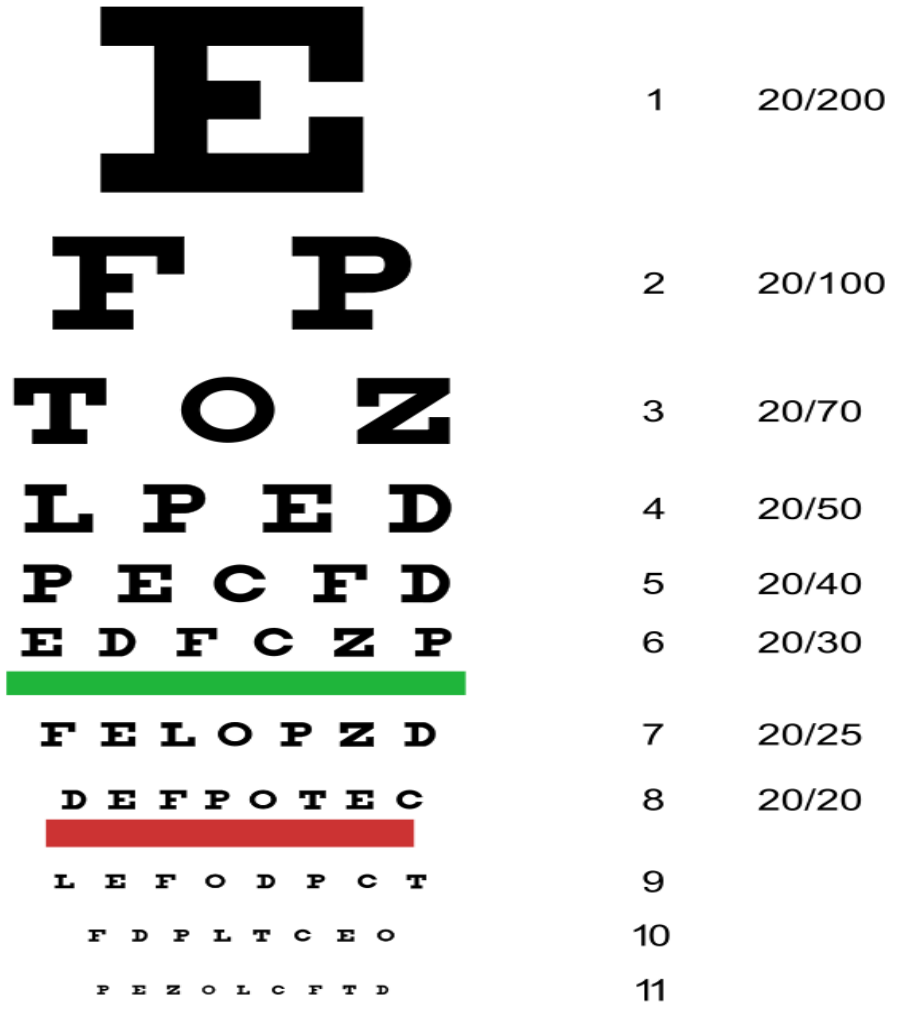


Visual assessment at bedside

- ❑Visual acuity
- ❑Color vision
- ❑Pupil exam
- ❑Visual field testing
- ❑Eyelid function
- ❑Extraocular motility

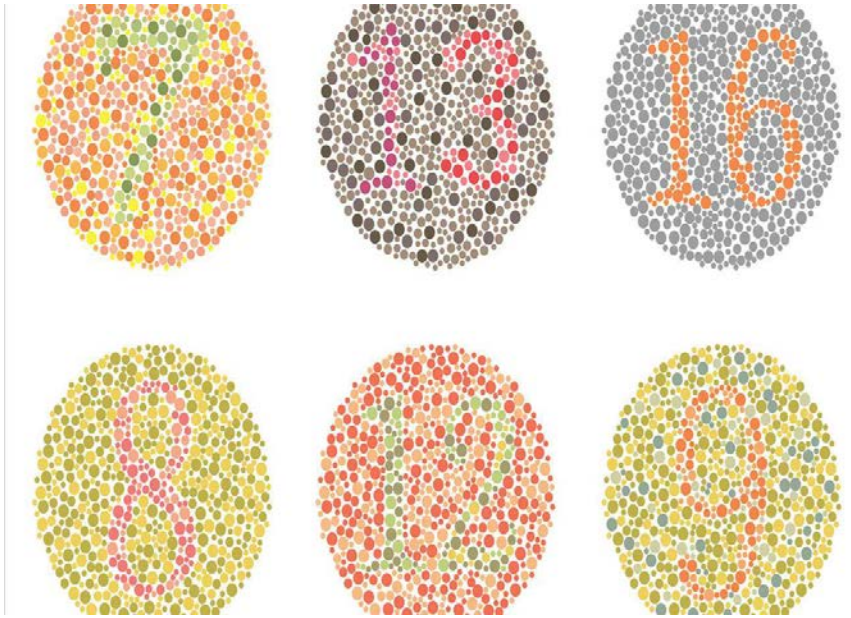
Visual acuity

- Measure in each eye individually with the patient's correction (eg. Glasses, contacts, etc)
- If can't see CARD at 6 feet
  - Count fingers (@ 12 inches)
  - Hand motion
  - Light perception

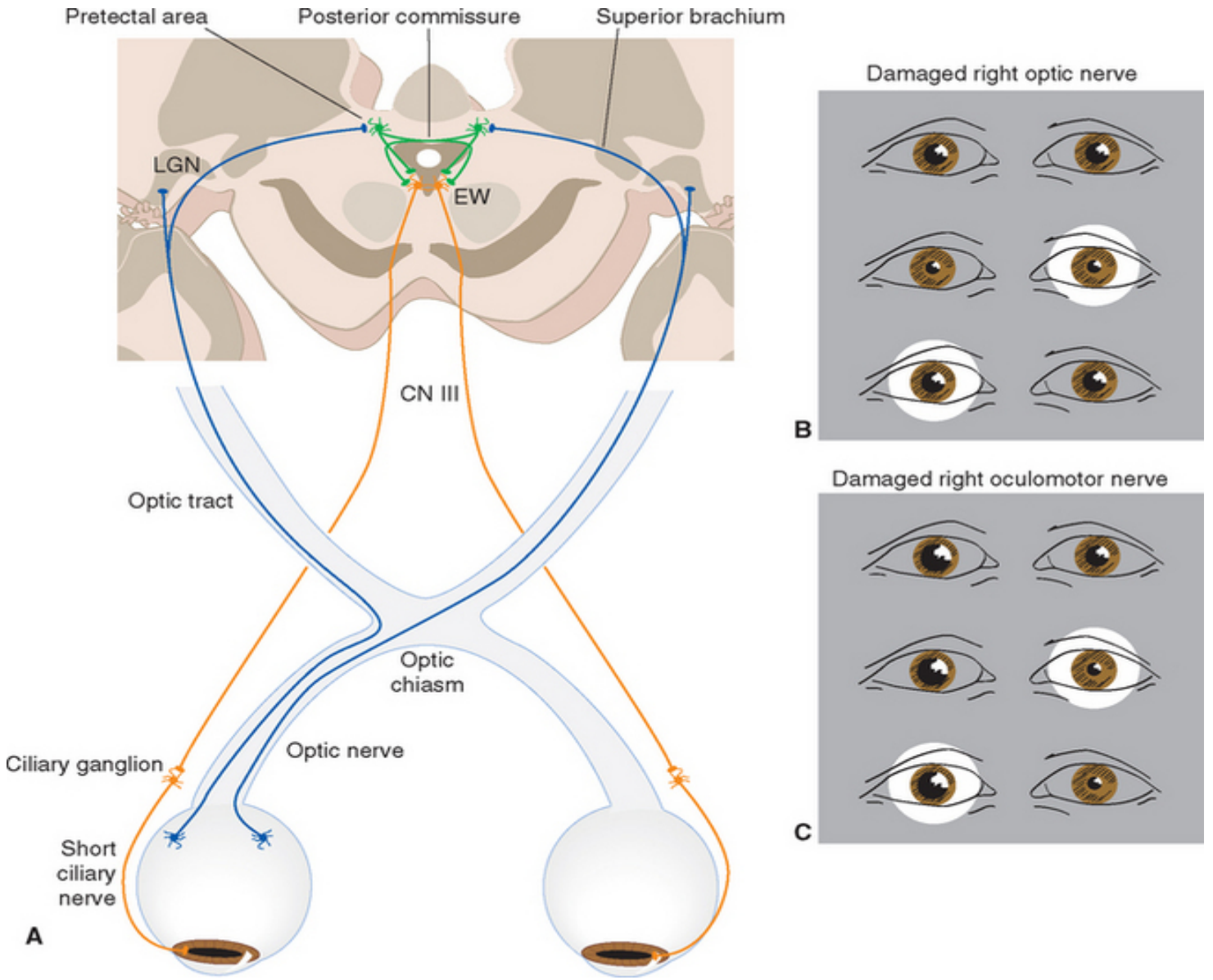


Color vision

Important to distinguish neurologic cause of MONOCULAR VISION LOSS from Ophthalmologic cause.



Pupil exam


Pretectal area
Posterior commissure
Superior brachium
LGN
EW
CN III
Optic tract
Optic chiasm
Optic nerve
Ciliary ganglion
Short ciliary nerve
A
Damaged right optic nerve
B
Damaged right oculomotor nerve
C

Horner’s syndrome

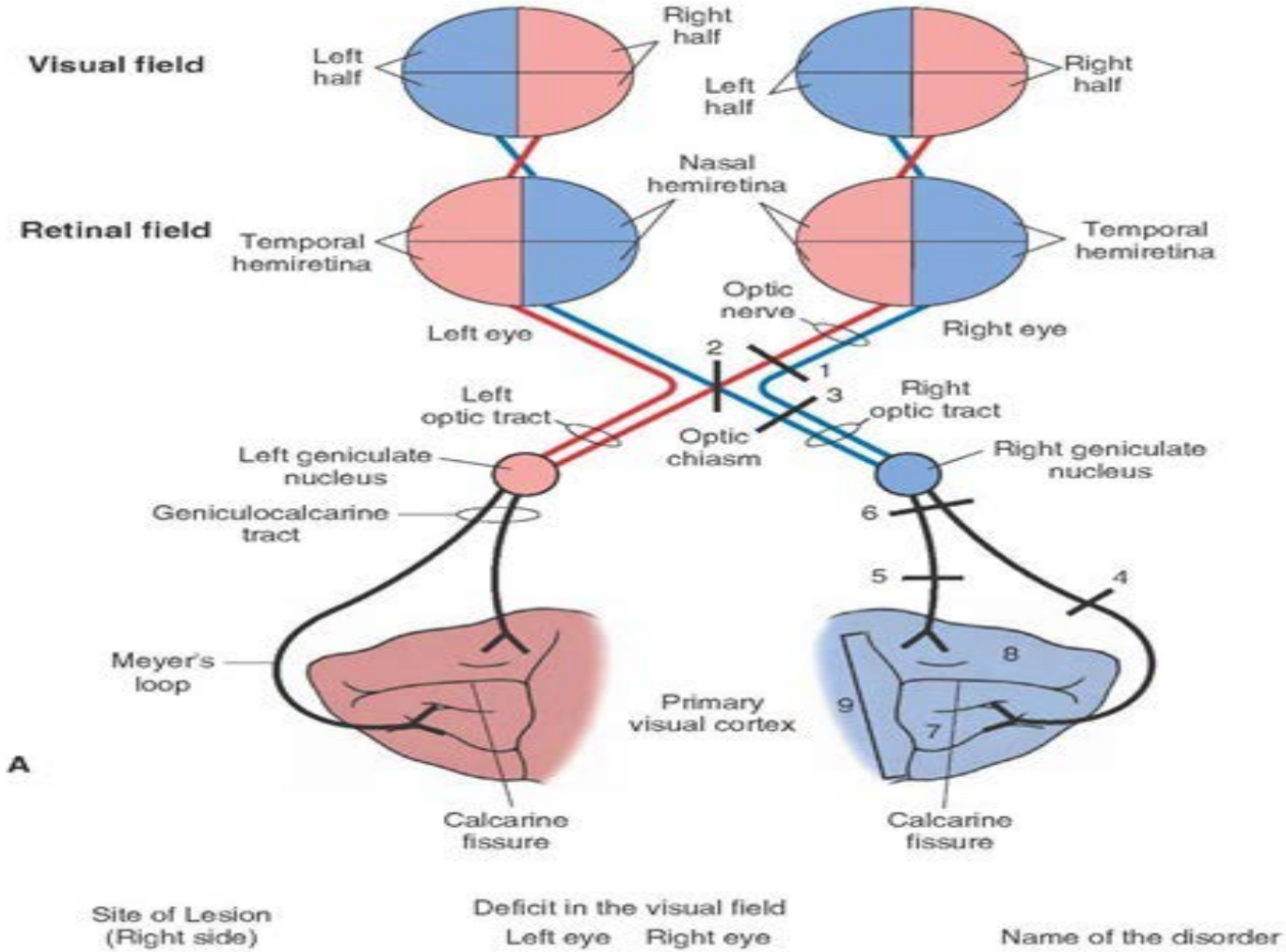
Carotid dissection
or brainstem stroke

PCOM aneurysm

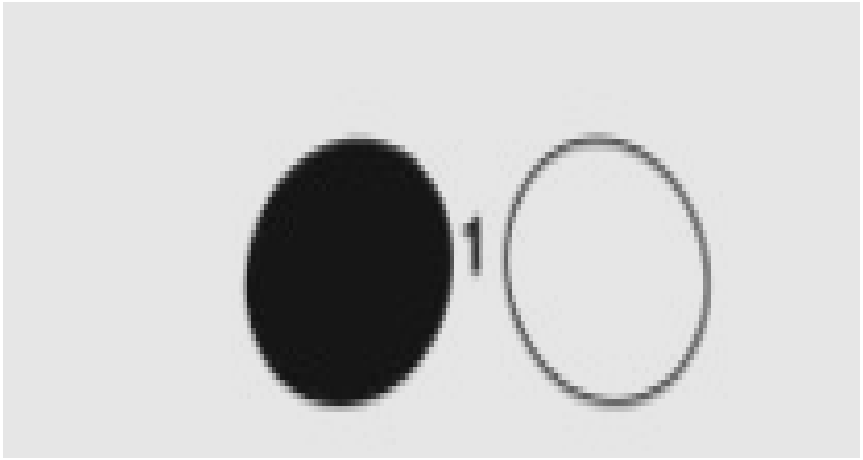
Brain herniation

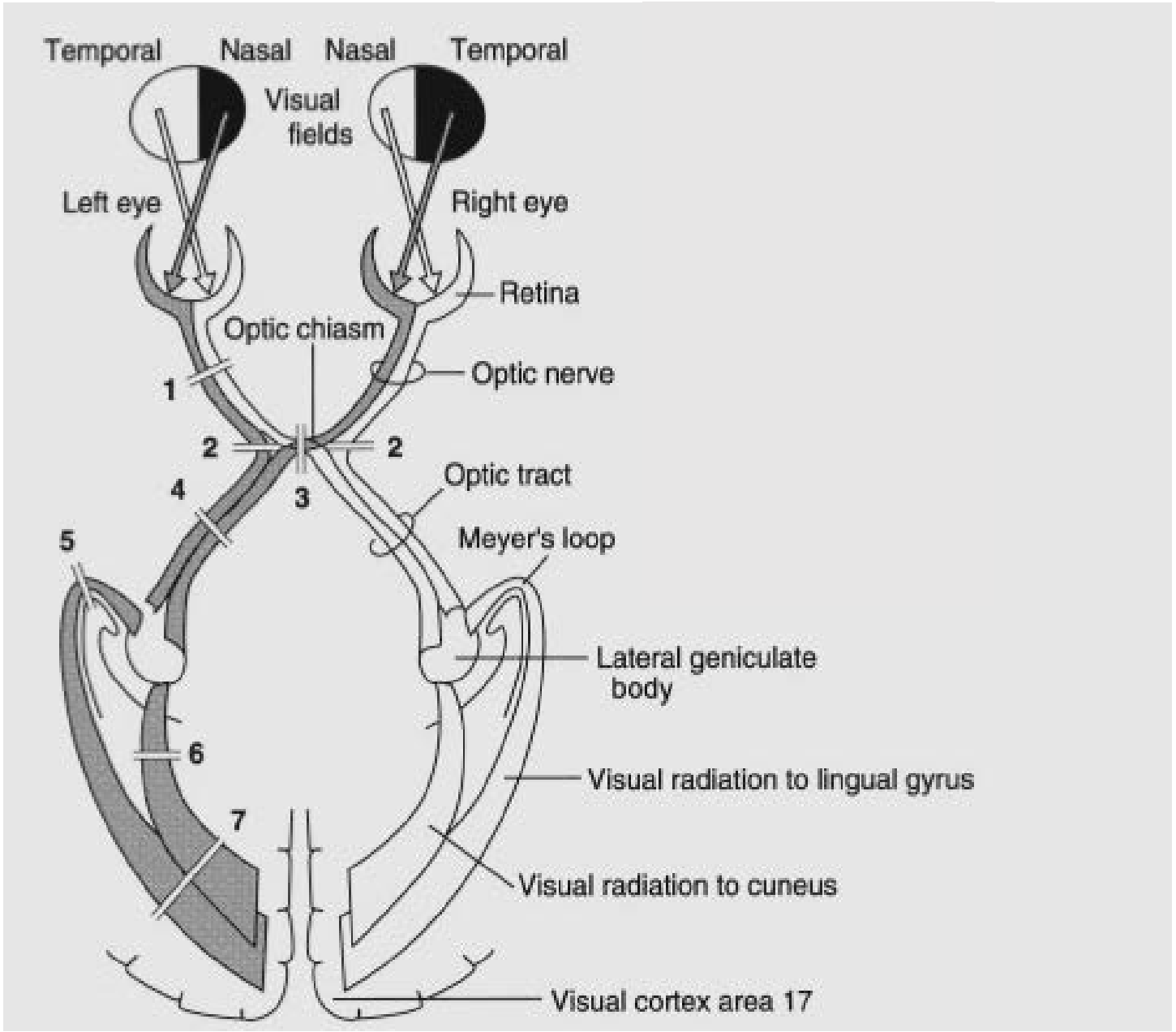
Pharmacologic pupil

Visual Field testing



NEVER brain


1

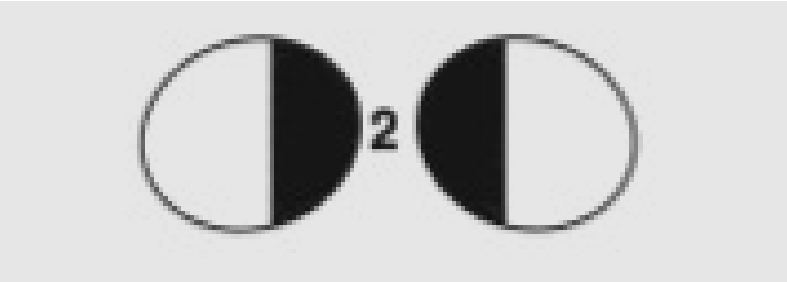

Temporal
Nasal
Nasal
Temporal
Visual fields
Left eye
Right eye
Retina
Optic chiasm
Optic nerve
1
2
2
3
4
Optic tract
5
Meyer's loop
Lateral geniculate body
6
Visual radiation to lingual gyrus
7
Visual radiation to cuneus
Visual cortex area 17

Causes of monocular vision loss

1. Refractive error
2. Media opacity
3. Macula
4. Retina
5. Ambylopia
6. Optic nerve

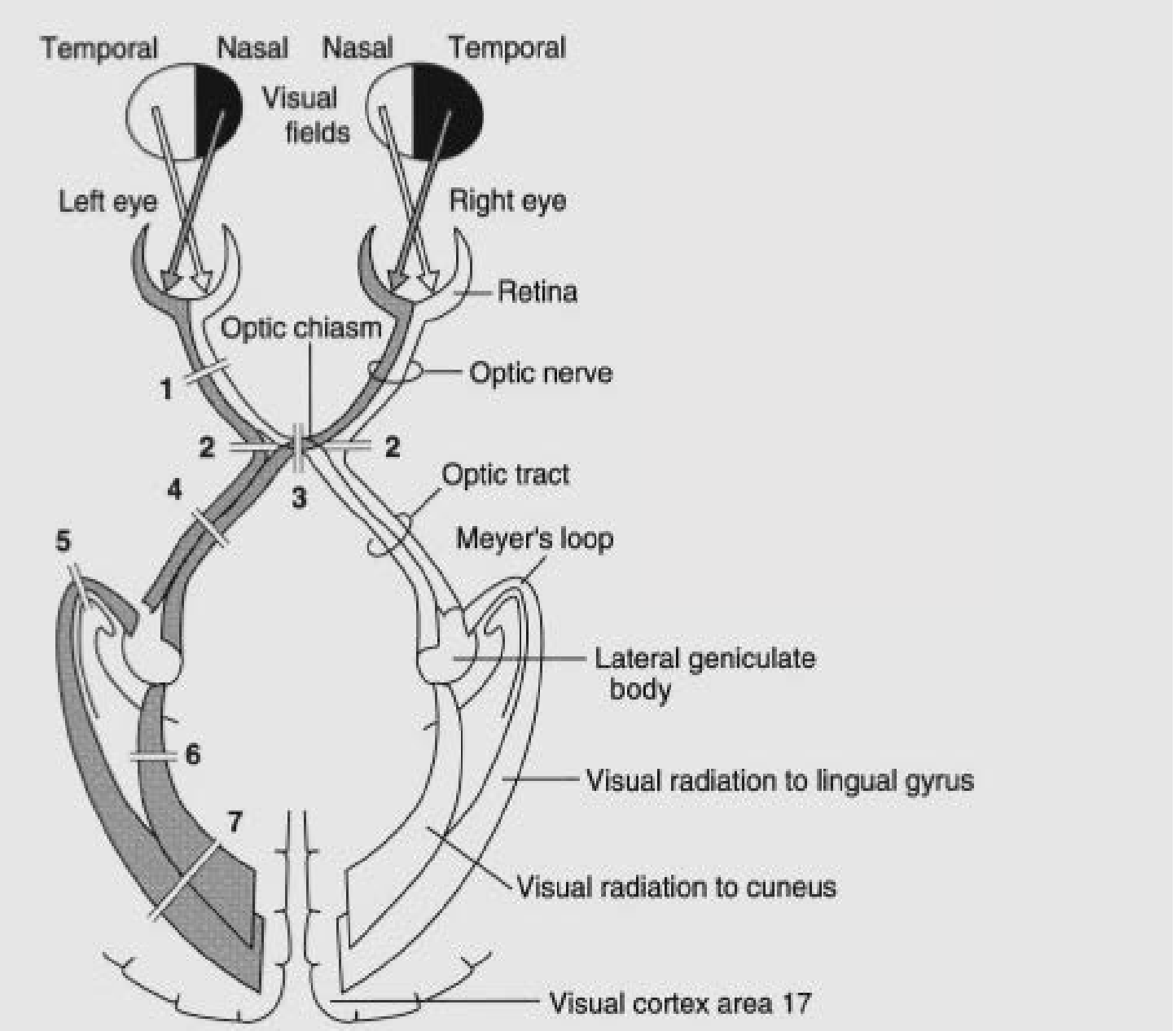
Location:

1) bilateral optic nerve
2) Retina

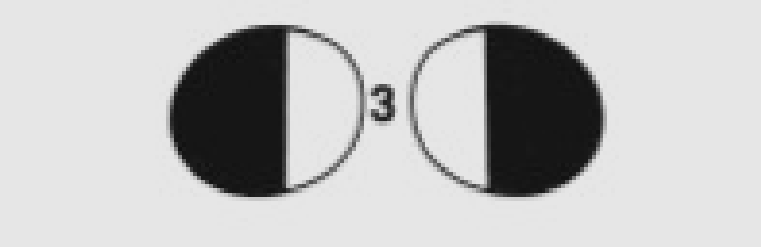


Diagnosis:

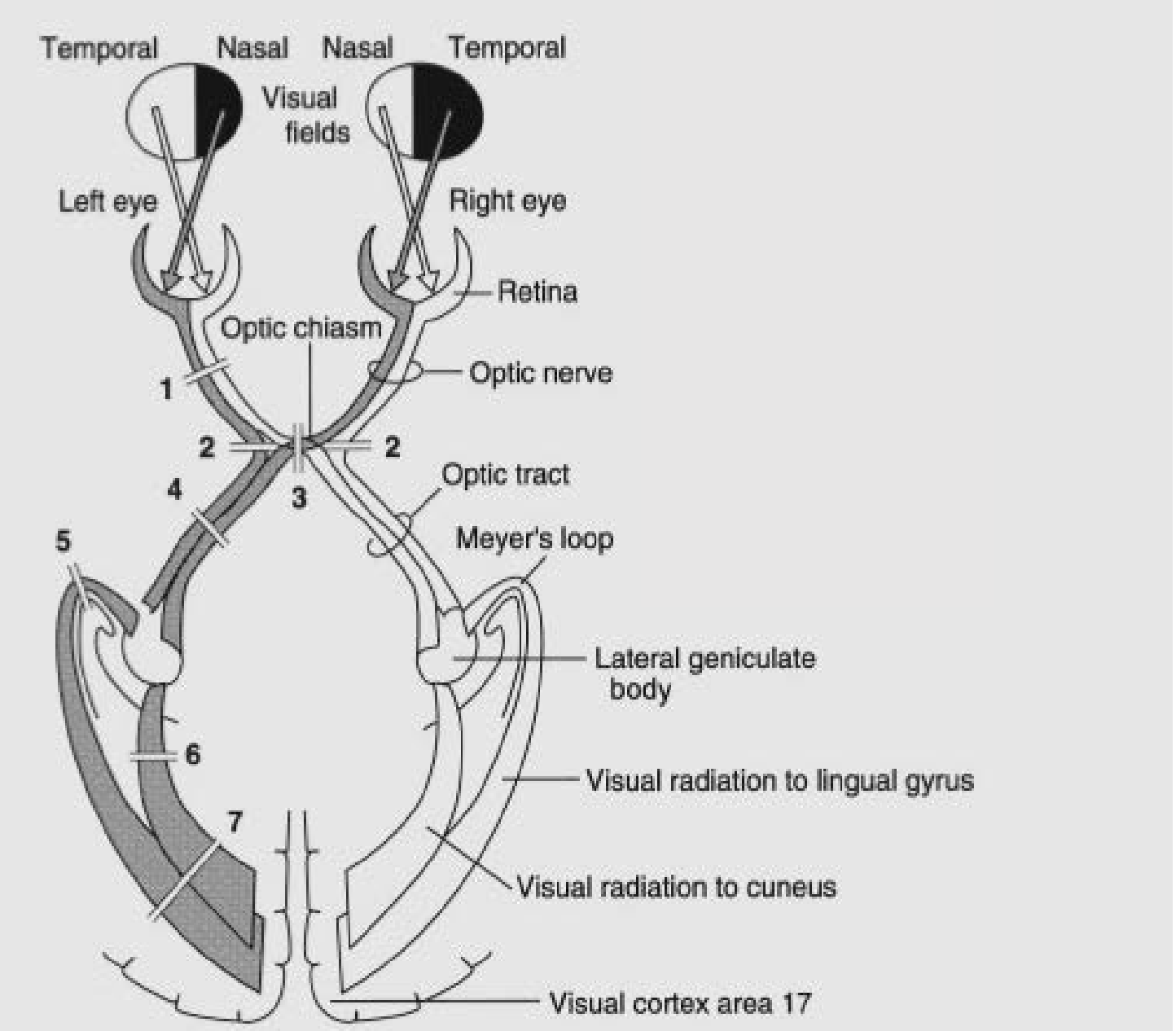
Binasal defect



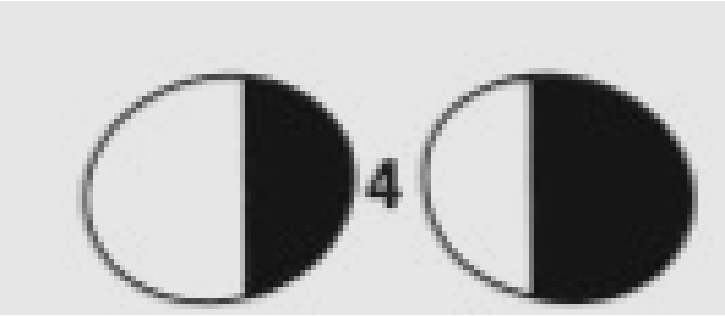
Location:
optic chiasm



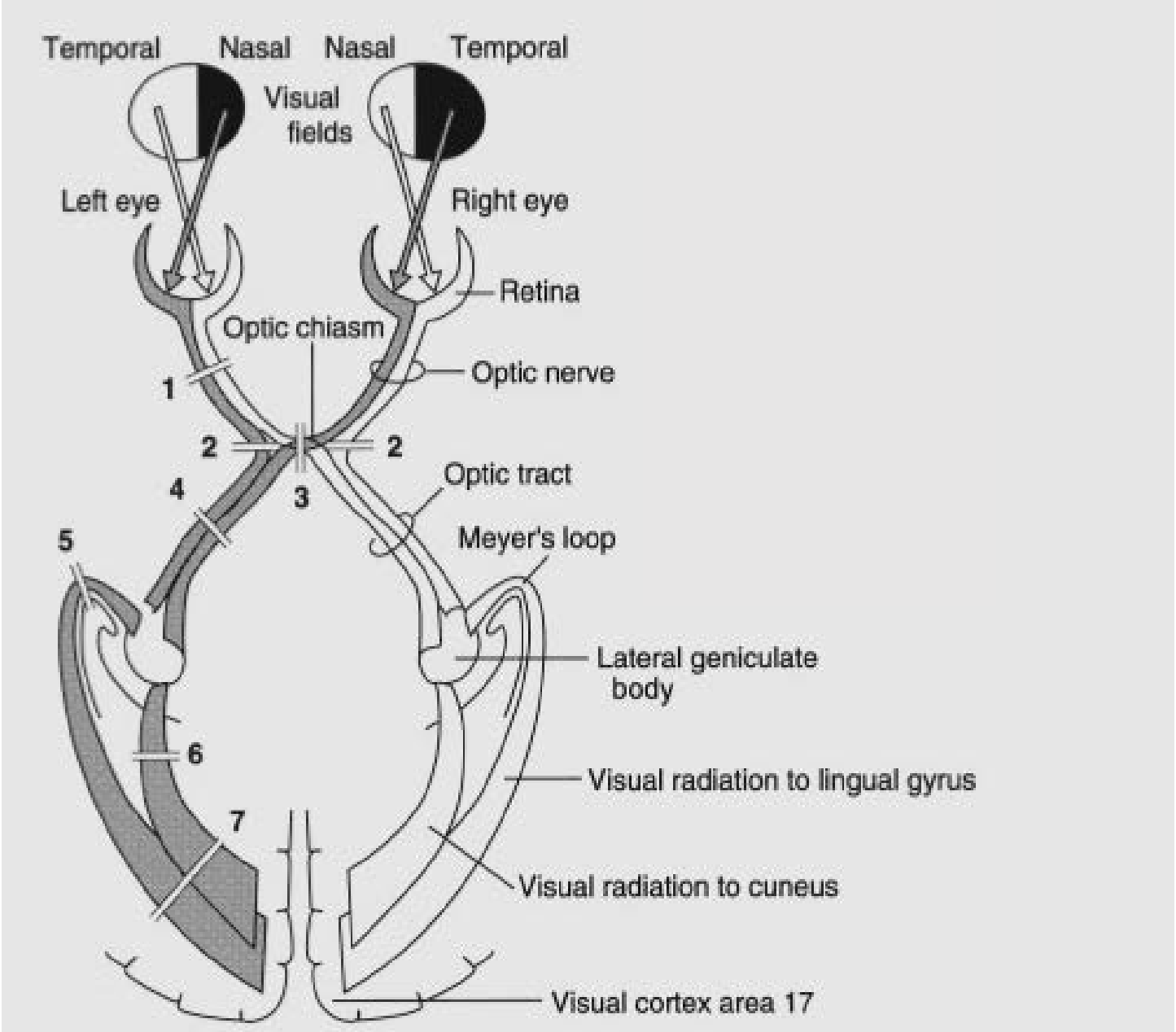
Diagnosis:
Bitemporal hemianopsia



Location:
Optic tract or
Occipital lobe

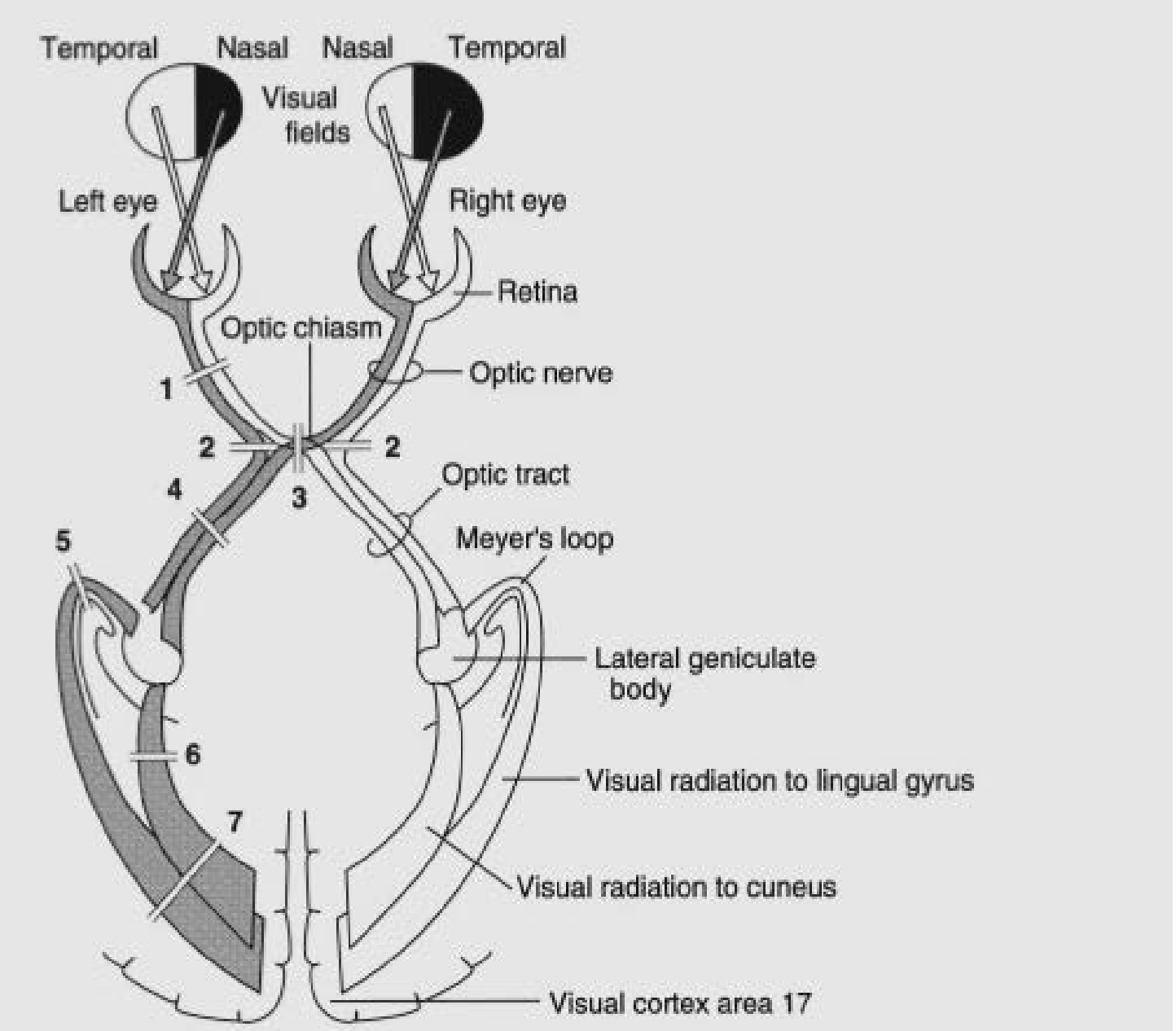


Diagnosis:
right homonymous hemianopsia

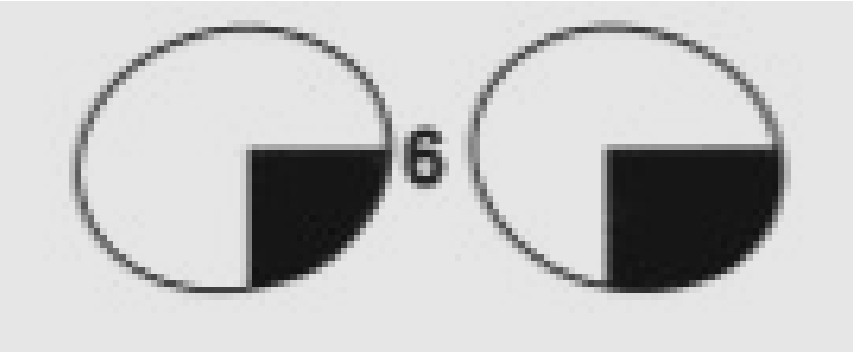


Location:
Temporal lobe

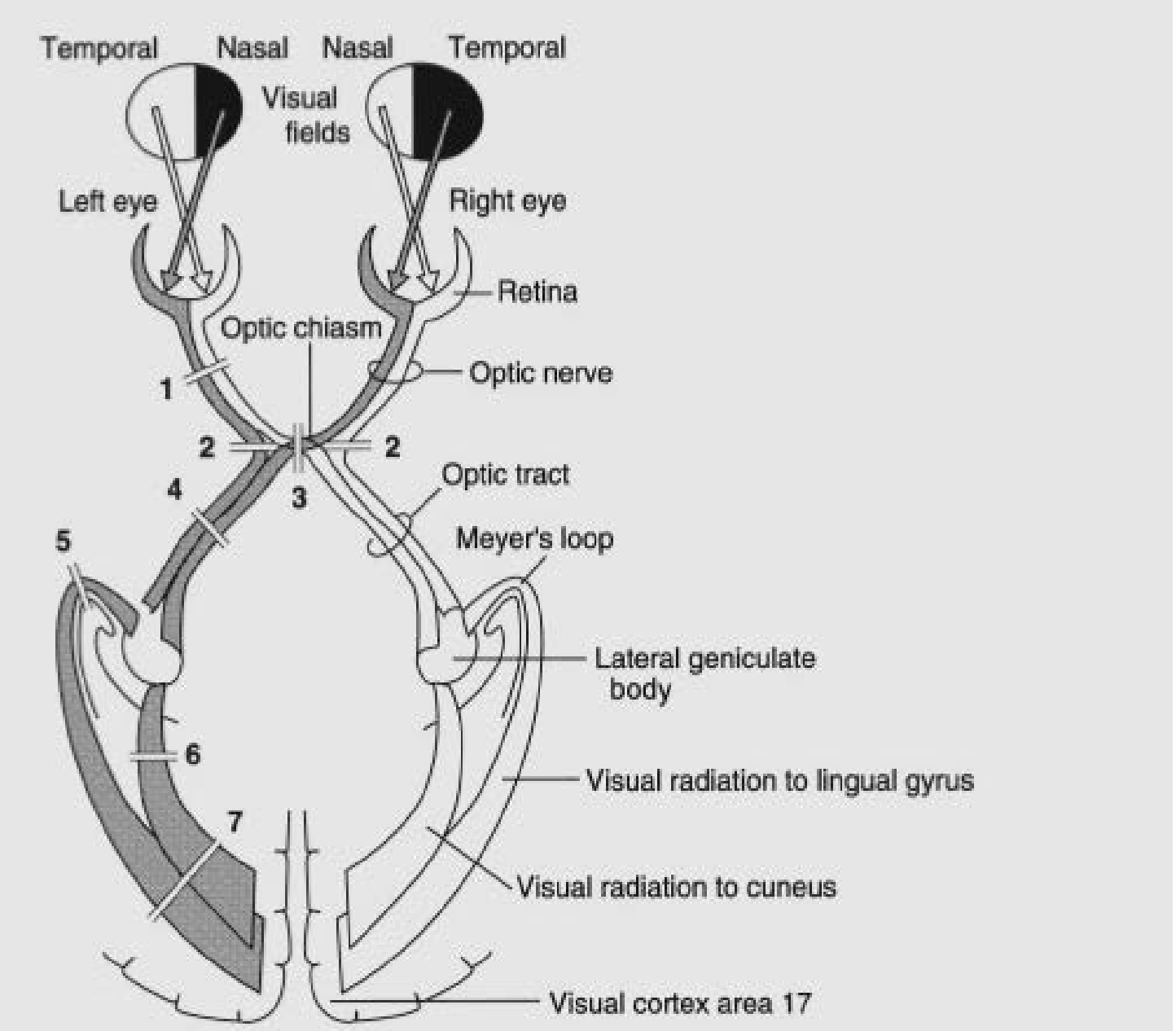
Diagnosis:
Superior quadrantinopia



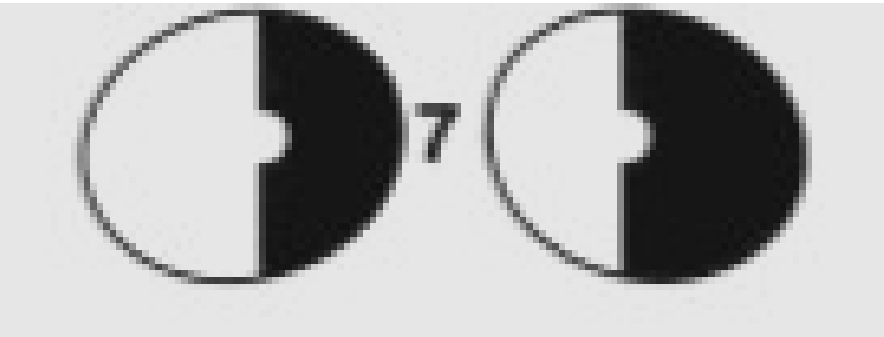
Location:
Parietal lobe



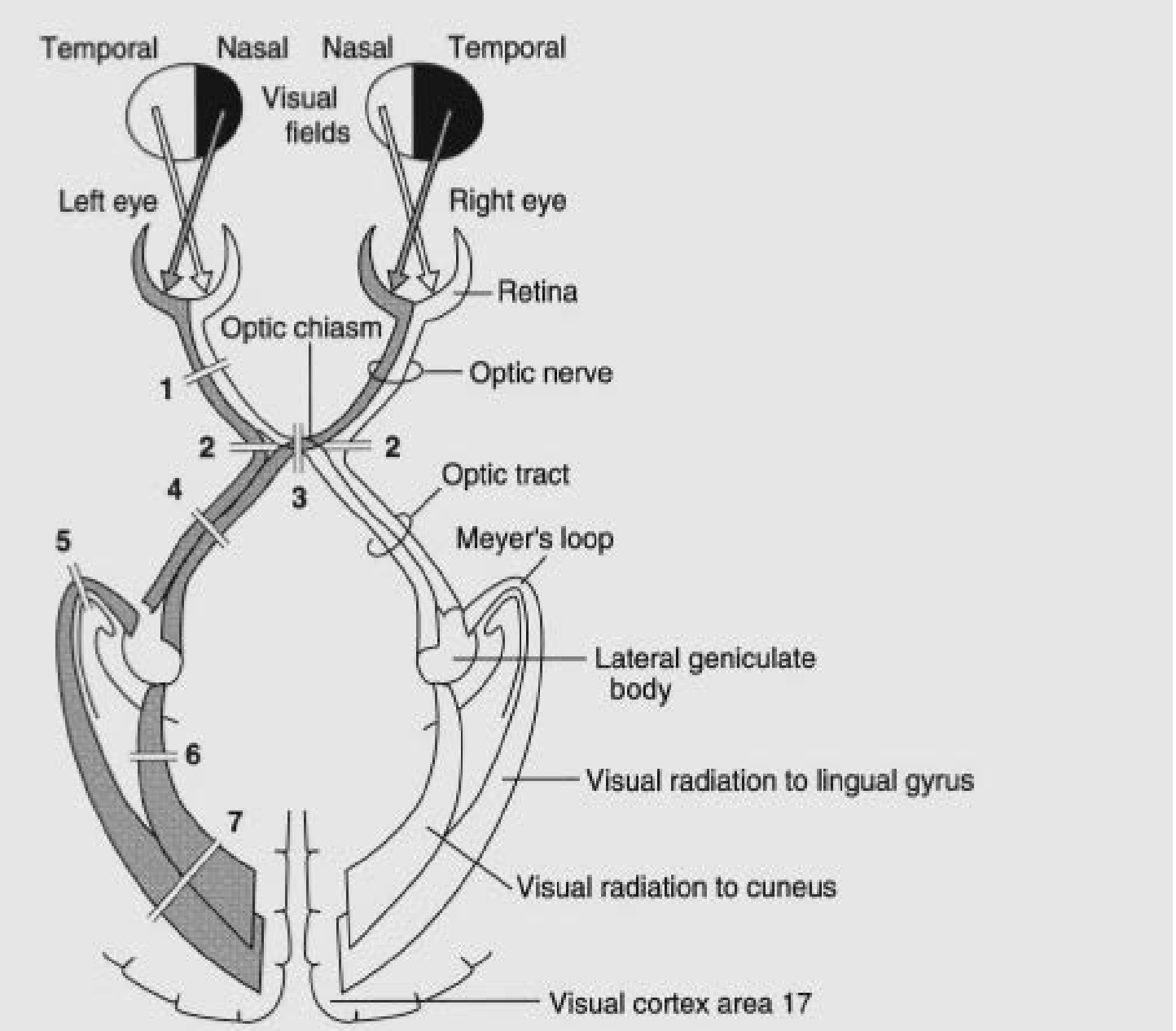
Diagnosis:
Inferior quadrantinopia



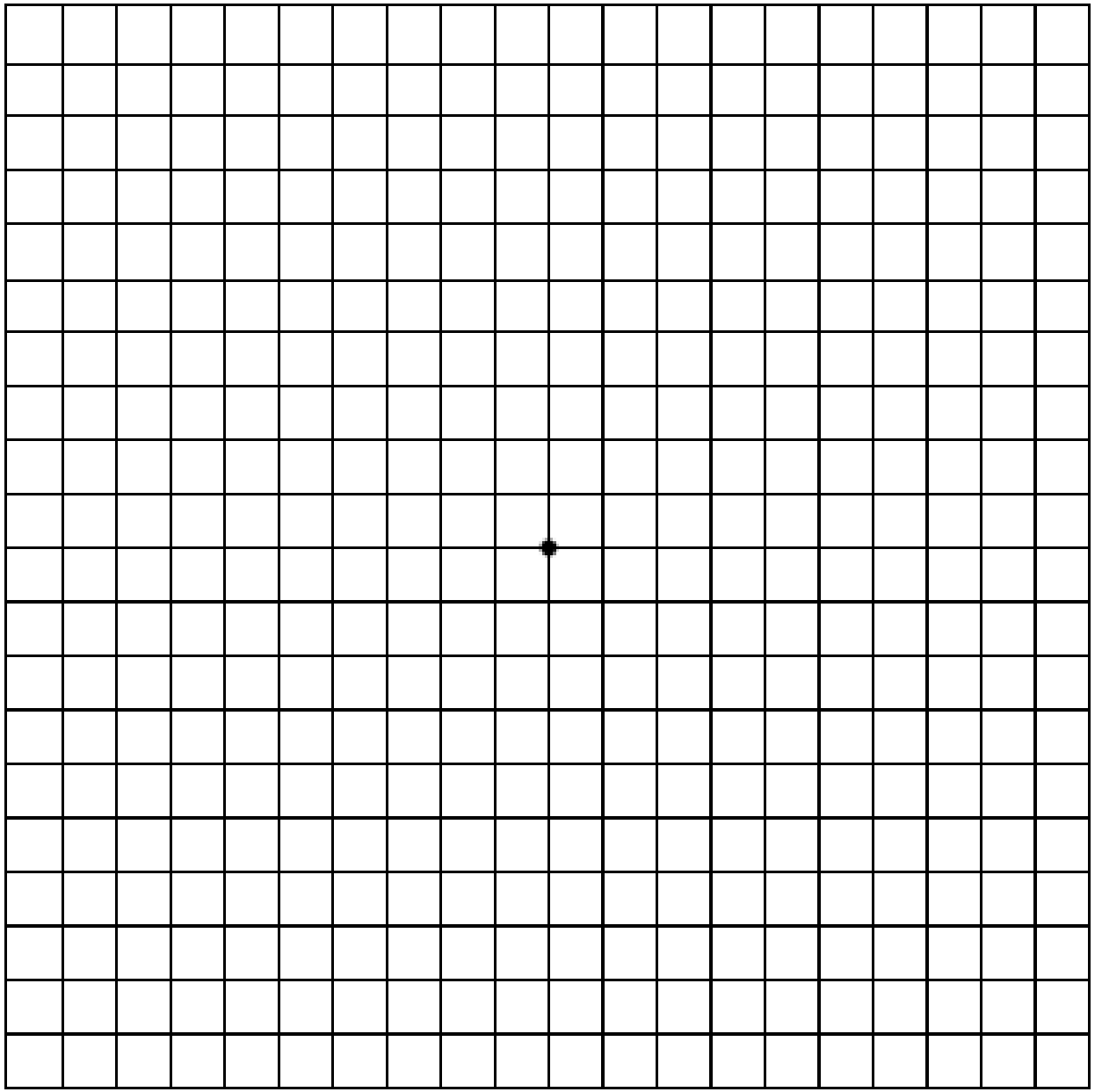
Location:
Occipital lobe



Diagnosis:
homonymous hemianopia



Amsler grid



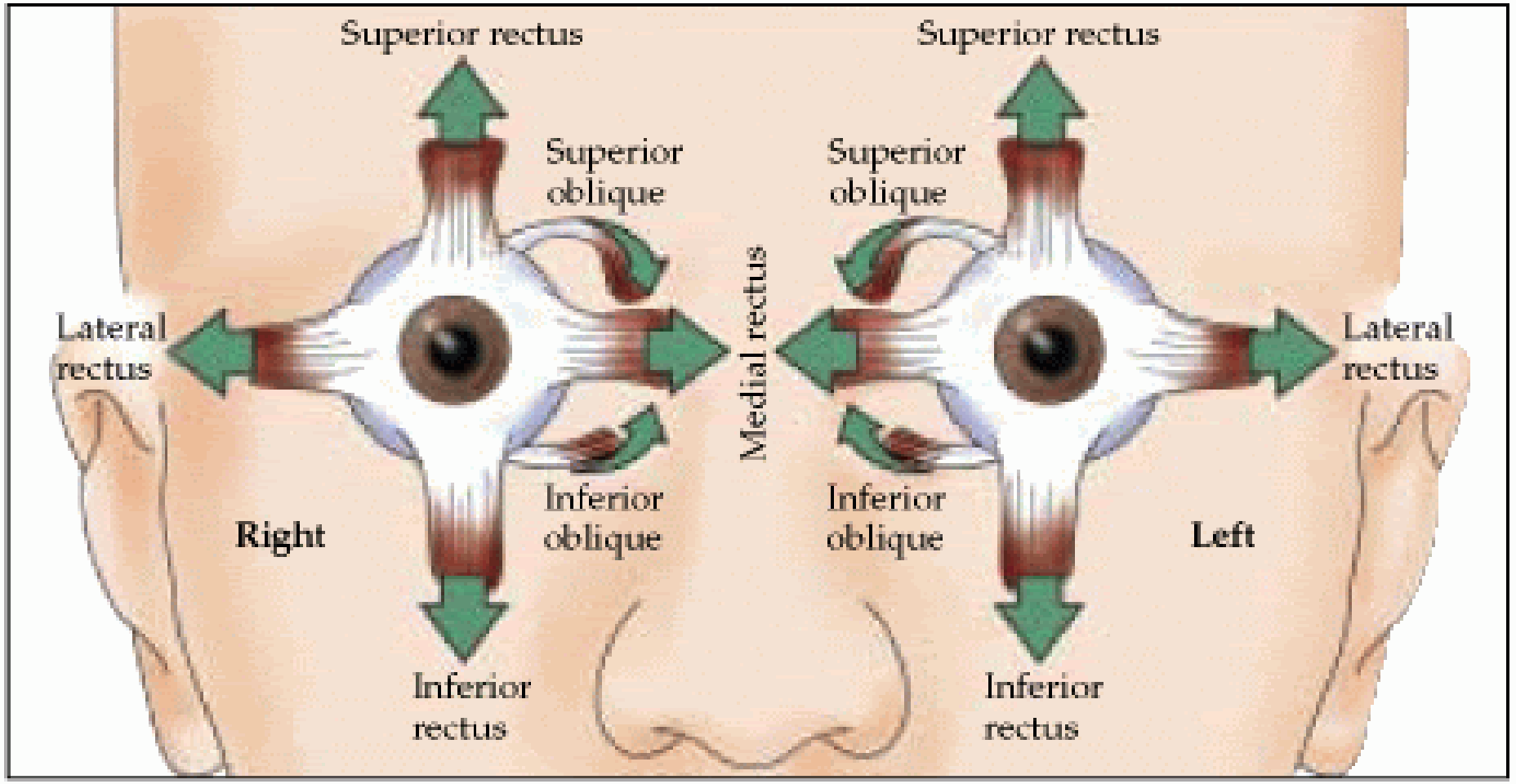
Treatment

- ❑Recovery training
- ❑Compensatory training
- ❑Optical aids (prisms)

Gaze deviation: SIGN of Large Vessel stroke

- ❑ Stroke: same side
- ❑Seizure: opposite side

Eye Movements

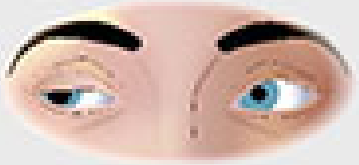
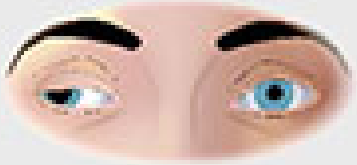
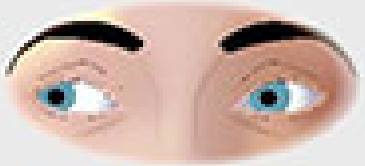
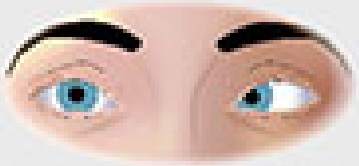
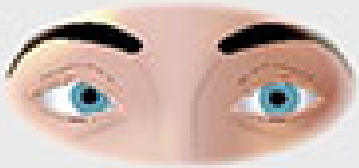
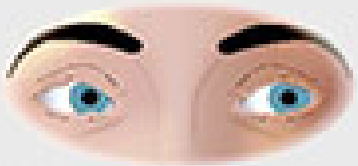


Monocular double vision

Diplopia with one eye open=ALWAYS AN OPHTHALMOLOGY ISSUE

Binocular double vision

- diplopia with both eyes open
- ALMOST ALWAYS NEUROLOGY

Cranial nerve palsy	Exam findings – evidence of incomitance		
	Direction of gaze ←	Primary position	Direction of gaze →
Right 3rd nerve palsy	 Smaller angle of horizontal squint	 Right eye turns downwards and outwards	 Unable to adduct right eye Larger angle of squint Double vision further apart
Right 4th nerve palsy	 No obvious squint	 Right eye turns upwards and outwards	 Right eye elevates more as it moves medially Double vision further apart
Right 6th nerve palsy	 Unable to adduct right eye Larger angle of squint Double vision further apart	 Right eye turns medially	 Able to adduct right eye No obvious squint

Treatment

- ❑Patch the affected eye for 1-2 weeks
- ❑ Try prisms after 6-8 weeks
- ❑ 6 month – 1 year recommend surgical correction

Eyelid

Horner’s syndrome

Carotid dissection
or brainstem stroke

Aneurysm

Treatment

- PTOSIS
  - Time
  - Eyelid crutches
  - Surgery
- Lagophthalmos
  - Eye patch at bedtime, drop
  - Surgery

References

- Radiopedia
- Uptodate

Questions