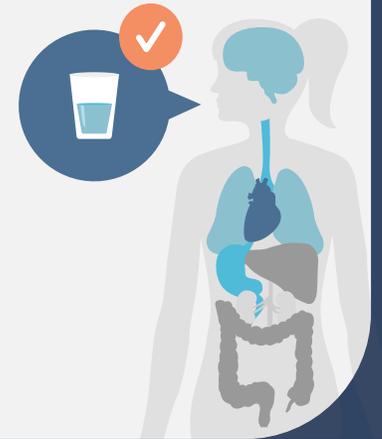
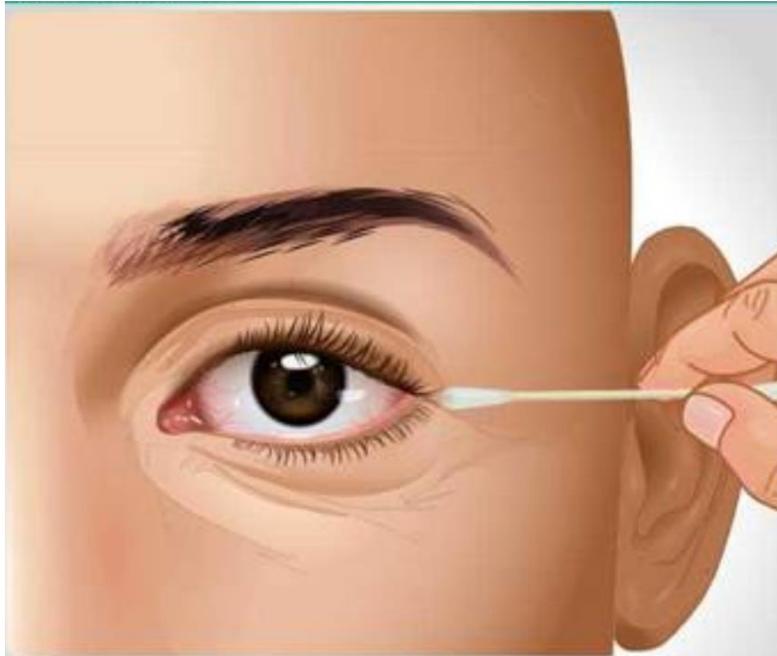




# Visual reflexes





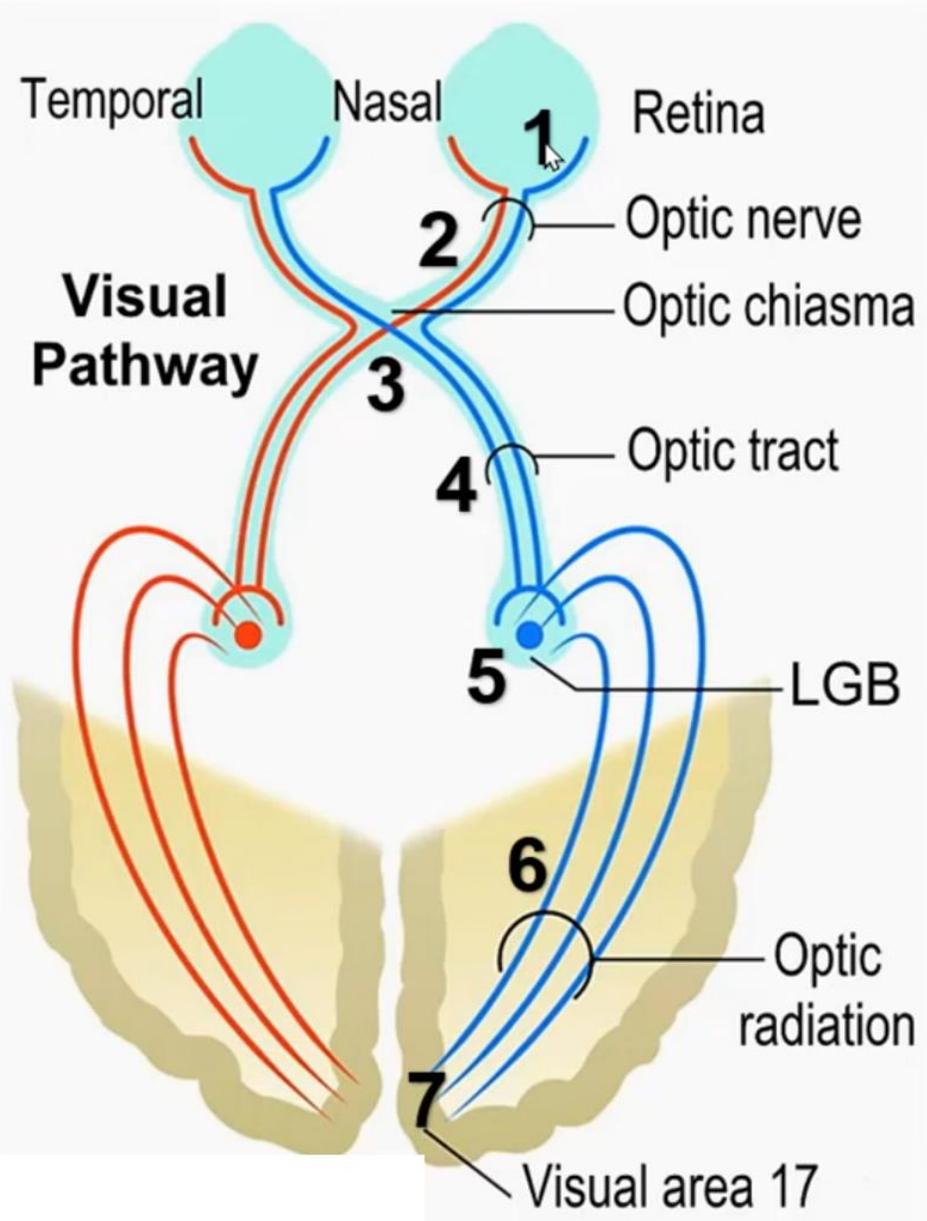
***Corneal  
Reflex***



***Pupillary Light  
reflex***



***Accommodation  
reflex***



**Retina:** rods & cones → rods & cone cells → synapse with bipolar cells → with ganglion cells

**Optic nerve:** formed of axons of ganglion cells

**Optic chiasma:** T fibers enter the ipsilateral optic tract. The *Nasal fibers cross* to enter the opposite optic tract

**Optic tract:** contains temporal fibers of the same side and nasal fibers of the opposite side

**LGB:** axons form optic radiation

**Optic radiation:** has 2 parts; pass through the retrolenticular part of the internal capsule

**Primary visual area 17:** in the upper and lower lips of the calcarine sulcus → **area 18 & 19**

# Corneal Reflex

- ***Definition :***

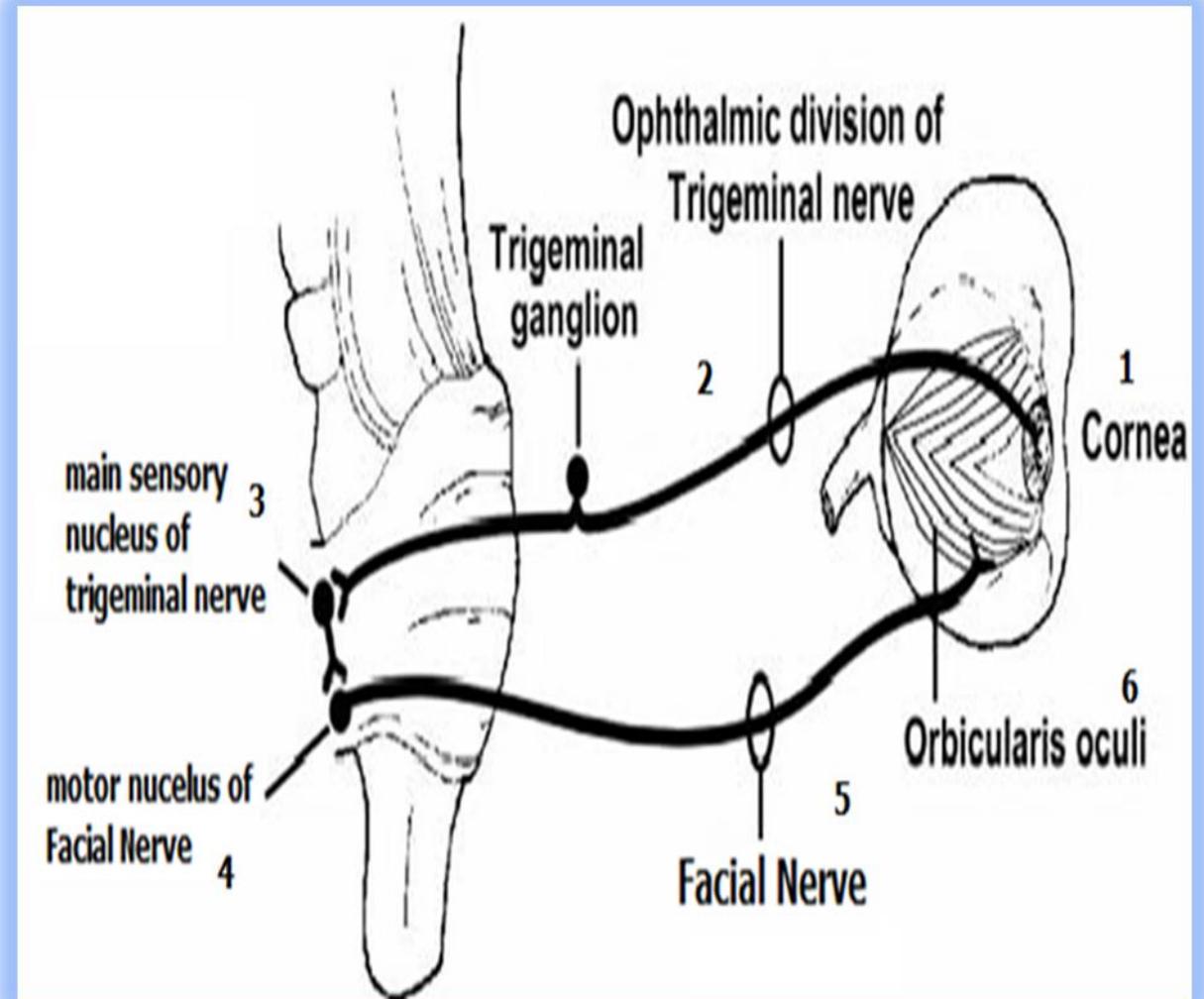
It is **reflex closure of both eyes** on touching the cornea of one eye with any foreign body. e.g., piece of cotton results in reflex blinking of both eyes.



# Corneal Reflex

## • Pathway:

<b>Receptors</b>	Touch receptors.
<b>Afferent</b>	Ophthalmic division of trigeminal nerve which relay in sensory nucleus of trigeminal nerve.
<b>Center</b>	Main facial nucleus in the pons.
<b>Efferent</b>	Facial nerve.
<b>Effector</b>	Orbicularis oculi muscle.
<b>Response</b>	Closure of the eyelids.



# Corneal Reflex

## • Significance :

### *Physiological:*

- 1) It is **protective** that protect cornea from foreign bodies.
- 2) **Loss** of corneal reflex **leads** to **corneal ulceration**.

### *Medical or clinical:*

- 1) It is used to detect the **pathway integrity**.
- 2) Test for functions of trigeminal and facial nerves.

# Pupillary Light Reflex

- **Definition :**

Exposure of one eye to light leads to:

- **Direct light reflex:**

- Reflex constriction of that eye.

- **Indirect or consensual light reflex:**

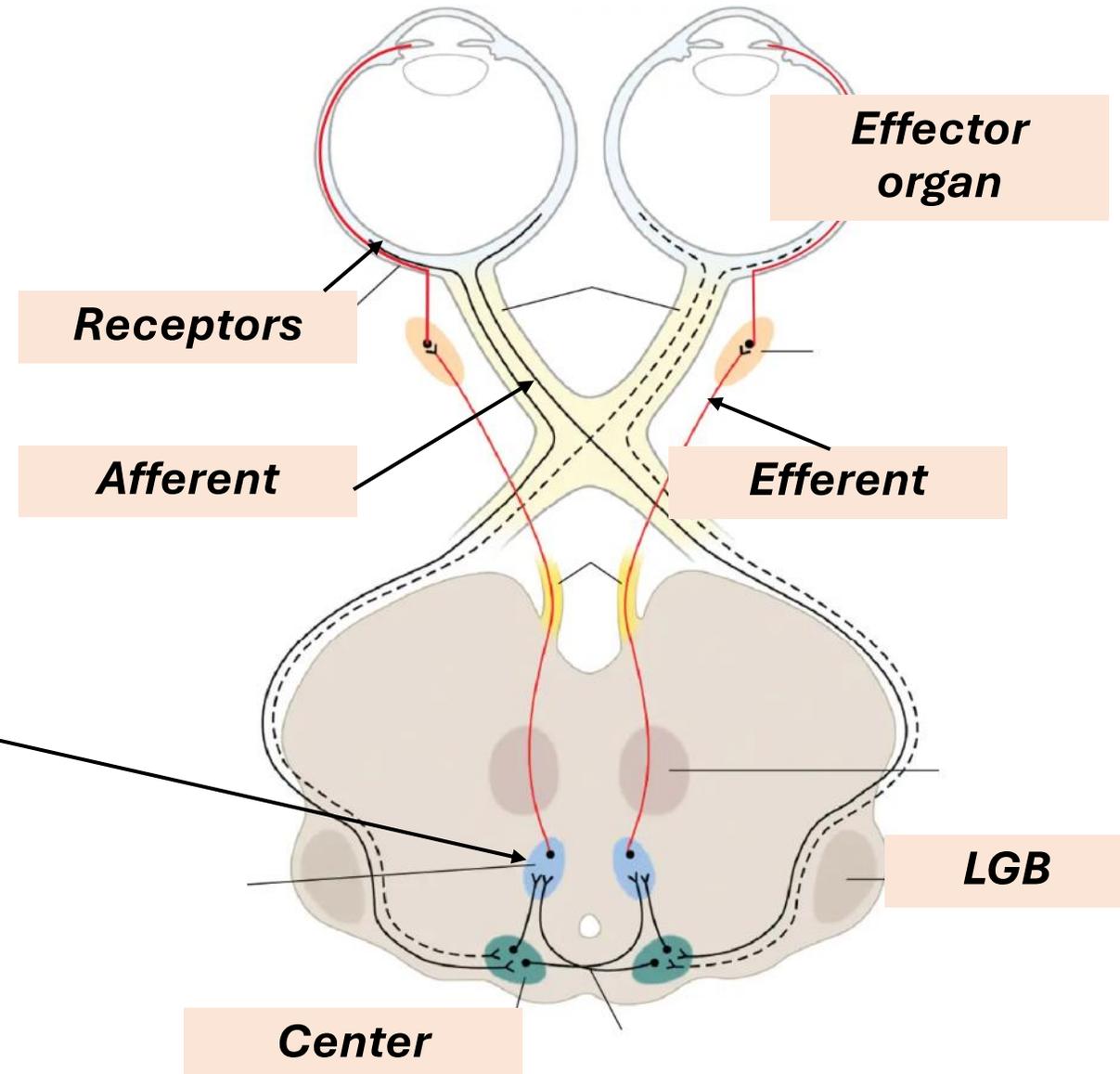
- Reflex constriction of the other eye.



# Pupillary Light Reflex

## • Pathway:

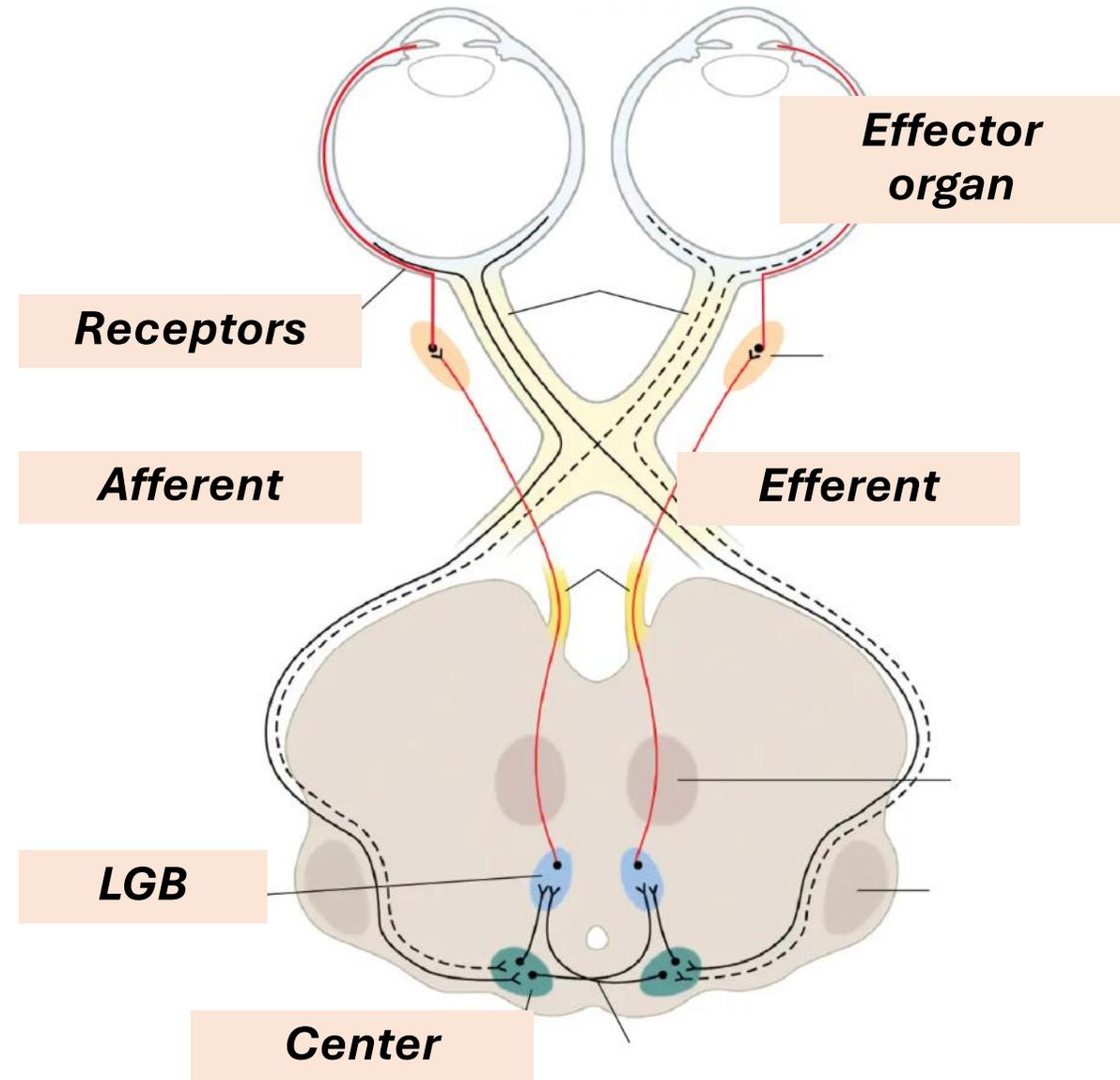
Stimulus:	Light
Receptors:	Visual receptors
Afferent:	Optic pathway before it reaches <b>LGB</b> .
Center:	<b>Pretectal nucleus</b> of the same side
Efferent:	<b>Tectonuclear tract</b> to Edinger Westphal nuclei of the oculomotor nerve on <b>both sides</b> .
Effector organ:	<b>Sphincter pupillae</b> muscles of both eyes
Response:	Constriction ( <b>miosis</b> ) of pupils of both sides.



# Pupillary Light Reflex

• Consensual light reflex is explained by :

- 1) **Partial decussation** at the optic chiasma.
- 2) **Bilateral innervation** of the Edinger Westphal nuclei from each pretectal nucleus.



# Pupillary Light Reflex

## • Significance :

### *Physiological:*

- ✓ It is **protective reflex** which prevents over exposure of the retina to harmful excessive illumination.
- ✓ **By controlling the amount of light entering the eye.**

### *Medical or clinical:*

- ✓ Diagnosis and localization of lesions in the pathway of the reflex.  
(See next)

# Pupillary Light Reflex

1) Lesion in the optic nerve of one eye :

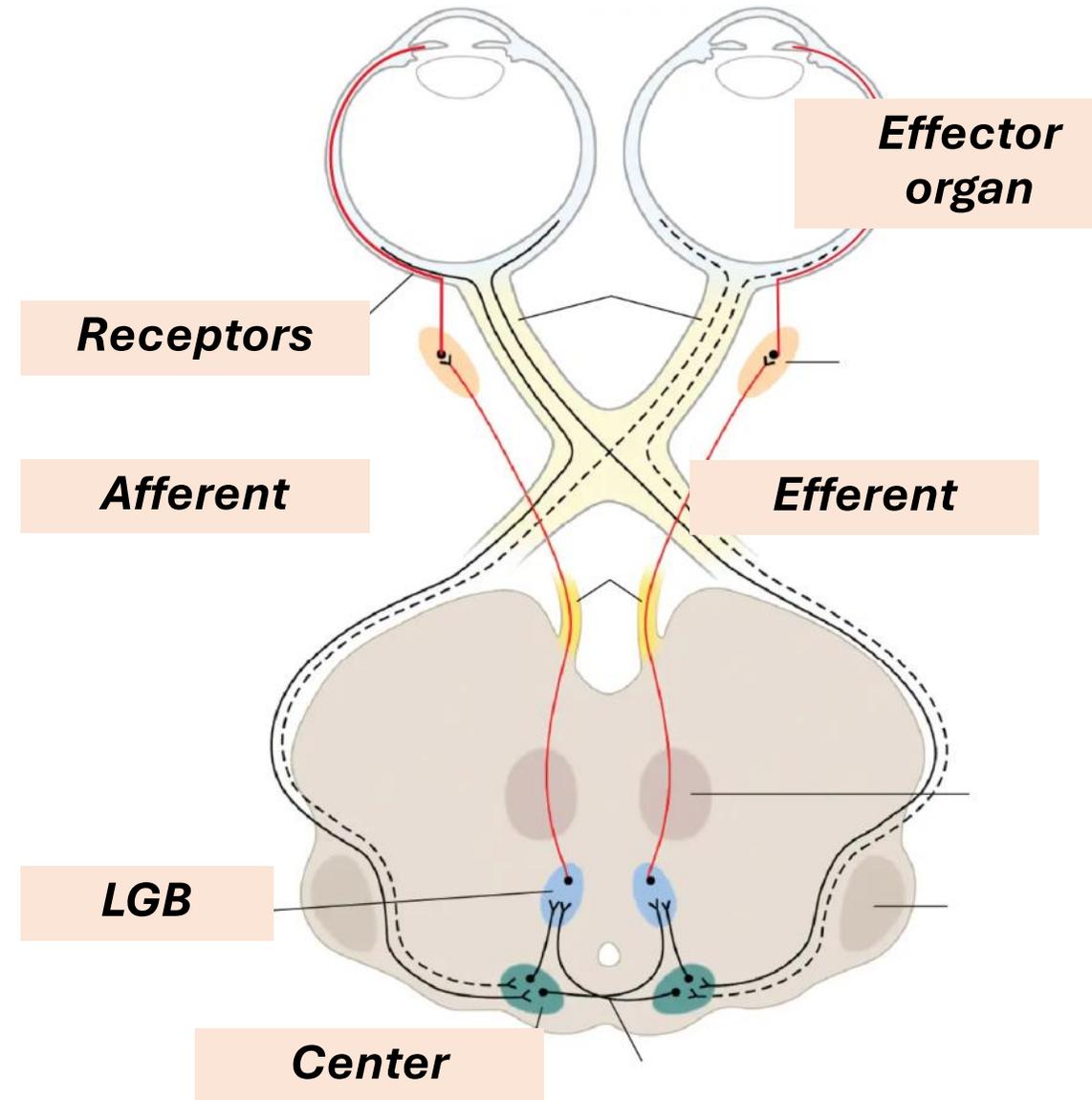
✓ Loss of **direct**, but **not the consensual** reflex in diseased eye.

2) Lesion in optic tract above the origin of fibers for light reflex:

✓ As Above.

3) Lesion in visual pathway beyond the optic tract i.e. in LGB, optic radiation or visual cortex:

✓ **Light Reflex intact.**



# Accommodation Reflex (near reflex)

## • Definition :

- It is the process in which the optical system of the eye is adjusted to see the near objects.

## • Changes :

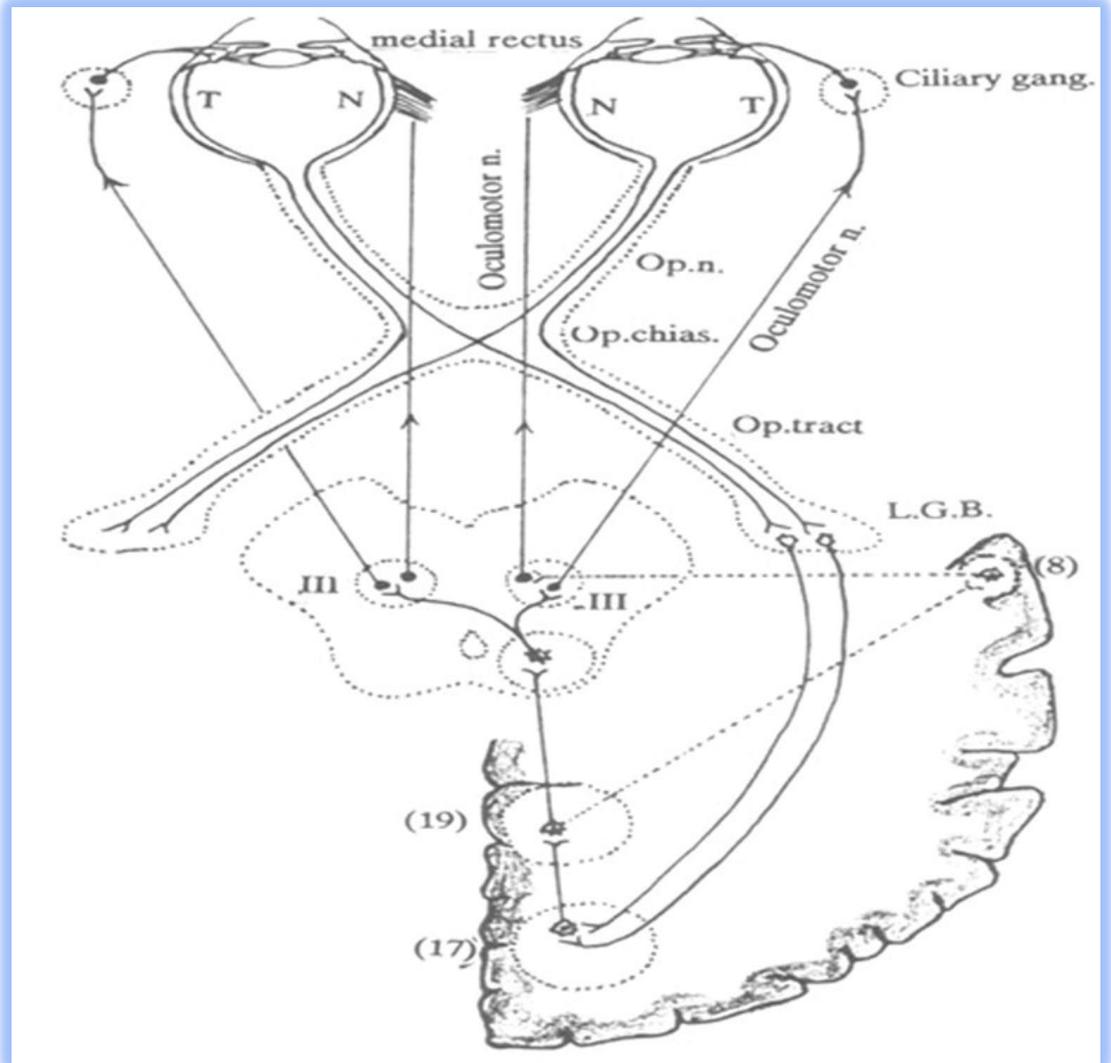
- Miosis** of both eyes.
- Increase lens convexity** of both eyes.
- Medial **convergence** of both eyes.



# Accommodation Reflex (near reflex)

## • Pathway:

Stimulus:	Blurring of image
Receptors:	Visual receptors
Afferent:	Visual pathway.
Center:	From visual cortex to 3rd cranial nerve nucleus.
Efferent & Effector organ & Response:	<ul style="list-style-type: none"> <li>▪ Somatic part of 3<sup>rd</sup> CN nucleus to medial rectus ms. mediates convergence.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Autonomic part: (EW nucleus) to ciliary ms. mediates its contraction and so increases Lens convexity.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Autonomic part: (EW nucleus) to constrictor pupillae ms for miosis.</li> </ul>



# Argyll-Robertson Pupil:

- Definition

It is a condition in which the pupil does **not respond to light reflex** but responds to accommodation reflex.

- Cause :

**Lesion in the pretectal nucleus** of the midbrain as in syphilis/or syringomyelia of the aqueduct of Sylvius which destroy the crossing fibers.



# Reverse argyll-robertson pupil:

- Definition

It is a condition in which the **pupil reacts in response to light reflex** and does not react in response to accommodation reflex.

- Cause :

It is due to lesion in the **occipitotectal tracts**.



Figure 2 (A) Light reflex. Constriction of the pupil in response to flash of light. (B) Near reflex. Constriction of the pupil in response to near object.

# Thank you

