



ANATOMICAL PATHWAY OF PUPILLARY LIGHT REFLEX



Eye Learn

All about the Eye

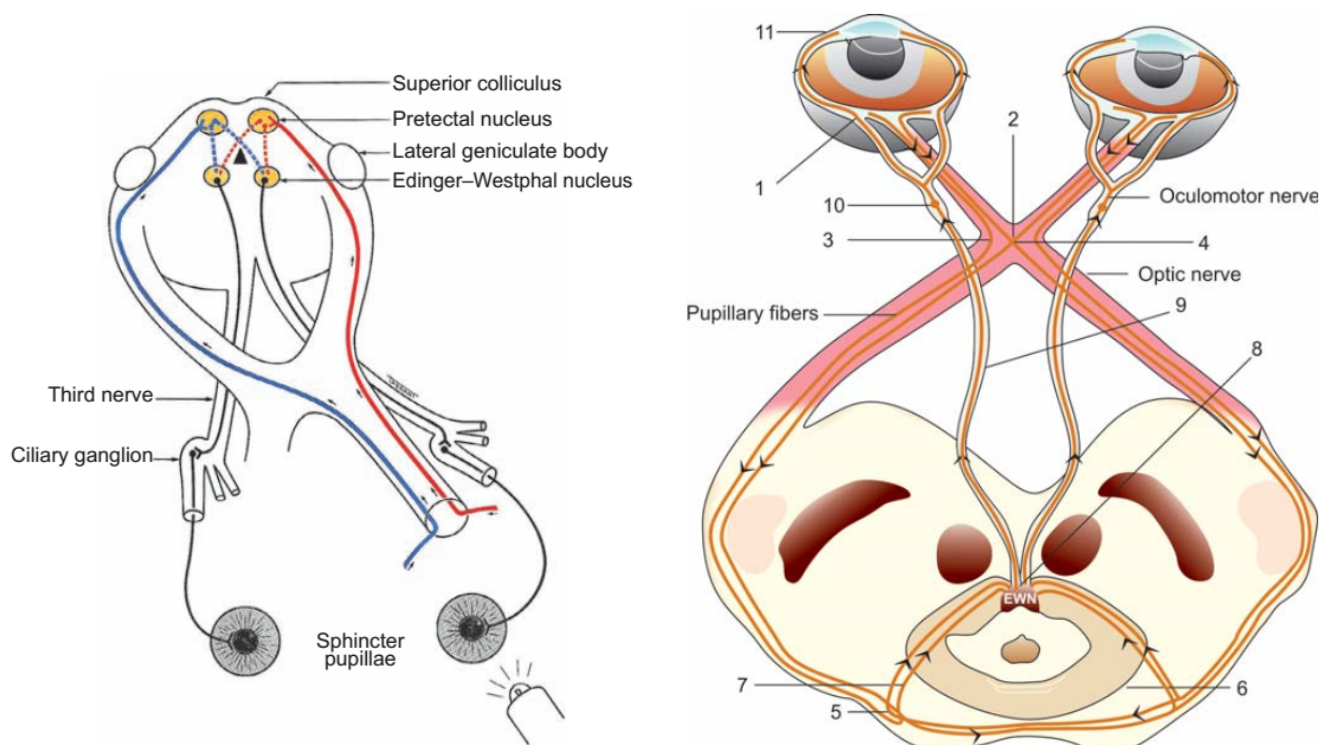
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1. Draw a labeled diagram of pupillary reflex pathway. (5) J2012
2. Pupillary pathways with diagram.(5) J2016



(1) Pupillary fibers in the nerve	(5) Brachium of the superior colliculus with B/L decussation	(9) Efferent pathway through the CN IIIN
(2) Chiasmal decussation	(6) Fibers decussated to the opposite side	(10) Synapse at the ciliary ganglion
(3) Uncrossed fibers	(7) Fibers decussated to the same side	(11) The fibers reach the sphincter pupillae muscle
(4) Crossed fibers	(8) Bilateral projection on the EW nucleus	

Light reflex - The light reflex is mediated by the retinal photoreceptors and subserved by four neurones

A. Afferent limb

1. **First (sensory)** connects each retina with both pretectal nuclei in the midbrain at the level of the superior colliculi.
 - Pupillary fibers travel along with the other fibres transmitting through the optic nerve.
 - Impulses originating from the nasal retina are conducted by fibres that decussate in the chiasm and pass up the opposite optic tract to terminate in the contralateral pretectal nucleus.
 - Impulses originating in the temporal retina are conducted by uncrossed fibres (ipsilateral optic tract) that terminate in the ipsilateral pretectal olivary nucleus.
2. **Second (internuncial)** connects each pretectal olivary nucleus to both Edinger–Westphal nuclei.
 - Thus a unioocular light stimulus evokes bilateral and symmetrical pupillary constriction.
 - Damage to internuncial neurones is responsible for light–near dissociation in neurosyphilis and pinealomas.

B. Efferent Limb

3. **Third (preganglionic motor)** connects the Edinger–Westphal nucleus to the ciliary ganglion.
 - The parasympathetic fibres pass through the oculomotor nerve, enter its inferior division and reach the ciliary ganglion via the nerve to the inferior oblique muscle.
4. **Fourth (postganglionic motor)** leaves the ciliary ganglion and passes in the short ciliary nerves to innervate the sphincter pupillae.
 - The ciliary ganglion is located within the muscle cone, just behind the globe.
 - It should be noted that, although the ciliary ganglion serves as a conduit for other nerve fibres, only the parasympathetic fibres synapse there.