

The Visual Pathway Neurons

1st Order	Photoreceptors to Bipolar Cells
2nd Order	Bipolar cells to Ganglion cells
3rd Order	Ganglion cells to Thalamus (LGN)
4th Order	Thalamus (LGN) to Visual Cortex

Visual Pathway Site Lesions

Optic nerve	Ipsilateral monocular blindness
Optic Chiasm (lateral)	Ipsilateral monocular nasal hemianopia
Optic tract	Contralateral homonymous hemianopia
Optic radiation	Contralateral homonymous quadrantanopia
Occipital cortex	Contralateral homonymous hemianopia with macular sparing

Visual Pathway Blood Supply

Optic nerve	Ophthalmic artery
Optic chiasm	Branches from: Internal carotid Posterior communicating artery Anterior cerebral artery Anterior communicating artery

Visual Pathway Blood Supply (cont)

Optic tract	Middle cerebral artery (MCA)
Lateral geniculate nucleus	Anterior choroidal branches of the MCA Thalamogeniculate branches of the posterior cerebral artery (PCA)
Optic radiations	MCA
Calcarine sulcus	Mostly by the PCA. The MCA also helps supply the anterior portion, which corresponds to the macula

Accommodation Pathway

Retina -->	Visual cortex (allows tracking of object to face)
Visual cortex -->	Midbrain (recruit pupillary reflex center)
Midbrain -->	Eye (Edinger-Westphal – constriction lens rounding)
Reflex Center -->	Oculomotor Nuc (convergence)

Taste Pathway (Ipsilateral) CN VII, IX, X

First order	Sensory neurons to Solitary nucleus
Second order	Solitary nucleus to Thalamus (VPM)
Third order	Thalamus (VPM) to Cortex

Olfaction Pathway (Ipsilateral; No Thalamus)

First order	Olfactory nerves to Olfactory bulb
Second order	Olfactory bulb to Olfactory Temporal Cortex

Motor Cranial Nerve (LMN) Lesions

Oculomotor	CN III	Extraocular muscles, levator palpebrae	Diplopia Loss of pup. constriction, accommodation media gaze; lateral deviation ("down and out") ptosis
Trochlear	Trochlear	Superior oblique	Diplopia upward gaze
Trigeminal Motor	CN V	Muscles of mastication	awaken weakness open jaw deviation to same side



Motor Cranial Nerve (LMN) Lesions (cont)

Nucleus Ambiguus	CN IX,X	Pharyngeal/laryngeal muscles	Difficulty swallowing, loss of gag, hoarse voice, dysarthria; uvula deviates to opposite side
Anterior horn C1-5	CN XI	Sternocleidomastoid, trapezius	Weakness in shoulder shrug and turning head to opposite side
Hypoglossal	CN XII	Tongue muscles	Tongue deviates to same side on protrusion

Drugs to treat Parkinson

Levodopa	Dopamine precursor	nausea, vomiting, hallucinations, delusions
Carbidopa	Dopa decarboxylase inhibitor	nausea, vomiting, hallucinations, delusions
Entacapone, Tolcapone	COMT inhibitor	nausea, vomiting, hallucinations, delusions, hepatotoxicity

Drugs to treat Parkinson (cont)

Rasagiline	MAO-B inhibitor	nausea, hallucinations Serotonin syn, tyramine effect
Amantadine (For dyskinesia)	Increases dopamine release, inhibits reuptake	ataxia, livedo reticularis
Benztr-opine, Trihexyphenidyl (For tremors)	Anti cholinergic	dry mouth, sweating, constipation, urinary retention, blurry vision

Eye Infections

Blepharitis	Inflammation of the eyelid, skin, lashes	Red, scaly or flaking eyelid skin	Lid Hygiene
Stye	Infection of Zeis, Moll, Meibomian glands	Painful swelling and redness of gland	Warm compress, antibiotics
Chalazion	Obstruction of Zeis or Meibomian glands	Painless, rubbery nodules	Warm compress, massage, antibiotics

Eye Infections (cont)

Conjunctivitis	Inflammation of the conjunctiva; bacterial or viral; allergy	Red eye with engorged vessels	Self-limiting, antibiotics
Keratitis	Inflammation of cornea—bacterial, viral, fungal, parasitic	red eye, photophobia, irritation, discharge, lacrimation, flurecein dye - ulcer	Antibiotics/-virals
Anterior Uveitis	Inflammation of the middle layer of the eye, infection, systemic inflammation, idiopathic	photophobia, pain, redness of eye/lid, WBCs in anterior chamber, hypopyon	Pupillary dilation, anti-inflammatory, anti-viral, steroids



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Not published yet.

Last updated 8th December, 2023.

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