Olfactory Nerve (CNI)

General Type	Special sense of smell or olfaction
Course	1. From olfactory receptor neurons in **nasal olfactory epithelium** in roof of nasal cavity. 2. Olfactory nerves pass via **foramina of cribriform plate of ethmoid**. 3. Olfactory bulbs (L+R) and olfactory tracts (L+R) enter cerebrum directly- synapse in olfactory cortex.
Nerve Lesion	Can no longer smell (anosmia), decreased sensitivity of smell (hypoosmia), exaggerated sensitivity (hyperosmia) or distorted smell (dysosmia).
Test for Integrity	Scent tests (eg. coffee).

Optic Nerve (CNII)

General Type	Special sense of vision
Course	1. Optic nerves (L+R) formed by axons of **retinal ganglion cells**- via optic disk enter the optic nerve- course via the orbit within the dural sheath. 2. Exit the orbit via the **optic canal**- into the middle cranial fossa to form the optic chiasm. 3. Optic tracts (L+R) proceed to terminate in the lateral geniculate bodies of the thalamus- axons arising from here form the optic radiations to the primary visual cortex in the occipital lobes.

Optic Nerve (CNII) (cont)

Nerve Lesions	Parts of fields of vision are gone (anopia) or no pupillary light reflex as light is not registered.
Test for Integrity	Pupillary light test, vision test (eg. looking at something in the distance).

Oculomotor Nerve (CNIII)

General Type	Motor: **Somatic motor**-all extraocular muscles (except SO_4LR_6) and levator palpebrae superioris. **Visceral motor (PS)**- via ciliary ganglion to sphincter pupillae and ciliary muscles.

Oculomotor Nerve (CNIII) (cont)

Course	1. Emerges from midbrain- via posterior and middle cranial fossae- travels via superior part of lateral wall of **cavernous sinus**. 2. Enters orbit via **superior orbital fissure** within common tendinous ring. 3. Divides into 2 divisions: ● Superior- for SR + LPS ● Inferior- for IR, MR + IO 4. Superior division runs on lateral side of the optic nerve and on inferior surface of SR piercing it to end up in LPS. 5. Inferior division breaks up into terminal branches immediately after entering orbit, carries **PS** (presynaptic) fibres to ciliary ganglion (synapse)- postsynaptic fibres via short ciliary nerves to ciliary body and the sphincter pupillae.
Distr-ibution	All extraocular muscles (except SO_4LR_6), LPS, sphincter pupillae and ciliary muscles.
Nerve Lesions	No accomodation or light reflex (unilateral), eye deviated laterally, drooping of eyelid (ptosis) or pupil constantly dilated.
Test for Integrity	Accomodation or light reflex.

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Trochlear Nerve (CNIV)

General Type	Motor: **Somatic motor**- to superior oblique muscle (abducts, depresses and medially rotates eyeball).
Course	1. Only cranial nerve that emerges on dorsal side of brainstem. 2. Travels via lateral wall of **cavernous sinus**, inferior to CNIII. 3. Enters orbit via **superior orbital fissure** superolateral to tendinous ring- runs above the LPS to SO muscle.
Distribution	Exclusively SO muscle.
Nerve Lesion	Cannot look down.
Test for Integrity	Look at tip of nose.

Trigeminal Nerve (CNV)

General Type	Mixed: **Somatic sensory**- principal sensory nerve of head, all 3 divisions. **Somatic motor**- 3rd division.
Course	1. Large sensory root and a small motor root emerge from lateral aspect of pons. 2. Sensory **trigeminal ganglion** located within trigeminal cave lateral to cavernous sinus. 3. Peripheral processes of ganglionic (sensory neurons) form 3 divisions ● Ophthalmic (V1) ● Maxillary (V2) ● Mandibular (V3) 4. Motor root fibres bypass trigeminal ganglion and blends with V3.

Trigeminal Nerve (CNV) (cont)

Extra Note	Sensory and motor branches are used by all 4 PS ganglia to carry postganglionic fibres to their destination.

Ophthalmic Nerve (CNV1)

General Type	Sensory
Course	From trigeminal ganglion traverses the lateral wall of the **cavernous sinus** and divides into 3 terminal branches via **superior orbital fissure** into the orbit.

Ophthalmic Nerve (CNV1) (cont)

Branches	1. **Lacrimal**- passes laterally close to orbital plate of frontal bone to enter lacrimal gland; innervates conjunctiva and skin above lateral canthus; also carries postganglion PS fibres from CNIII- via CNV2 to lacrimal gland. 2. **Frontal**- runs above LPS, divides into supraorbital (to frontal scalp skin) and suprat-rochlear (to skin above medial canthus. 3. **Nasocililary**- runs on medial side of orbit: ● Infratrochlear- terminal branch to skin adjacent to medial canthus. ● Ethmoidal (anterior + posterior)- via anterior and posterior ethmoidal foramina to ethmoidal and sphenoidal sinuses, dura in anterior cranial fossa and nasal mucosa. ● External nasal- to skin of nose. ● Long ciliary- sensory to ciliary body, iris, cornea, carry S fibres to dilator pupillae. ● Short ciliary- carry sensory, S fibres and PS fibres from ciliary ganglion to sphincter pupillae and ciliary muscles.
Distribution	Sensation from cornea, upper conjunctive, dura mater, mucosa of antero-superior nasal cavity, frontal, ethmoidal paranasal sinuses, skin of face and upper eyelid.

Ophthalmic Nerve (CNV1) (cont)	
Corneal Reflex	Afferent- from CNV1. Efferent- from CNVII.
Nerve Lesions	No corneal reflex or cannot feel area V1 supplies on face.
Test for Integrity	Touch area on face that V1 supplies or perform the corneal reflex.

Maxillary Nerve (CNV2)	
General Type	Sensory
Course	From trigeminal ganglion traverses lateral wall of **cavernous sinus** and exits cranial cavity via **foramen rotundum** in greater wing of sphenoid to enter pterygopalatine fossa. Terminal part enters orbit via **inferior orbital fissure** and terminates as infraorbital nerve.
Branches	1. Meningeal. 2. Ganglion branches to PPG. 3. **Infraorbital**-