

Olfactory Nerve (CNI)

<i>General Type</i>	Special sense of smell or olfaction
<i>Course</i>	<ol style="list-style-type: none"> From olfactory receptor neurons in nasal olfactory epithelium in roof of nasal cavity. Olfactory nerves pass via foramina of cribriform plate of ethmoid. Olfactory bulbs (L+R) and olfactory tracts (L+R) enter cerebrum directly- synapse in olfactory cortex.
<i>Nerve Lesion</i>	Can no longer smell (anosmia), decreased sensitivity of smell (hyposmia), exaggerated sensitivity (hyposmia) or distorted smell (dysosmia).
<i>Test for Integrity</i>	Scent tests (eg. coffee).

Optic Nerve (CNII)

<i>General Type</i>	Special sense of vision
<i>Course</i>	<ol style="list-style-type: none"> 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. Exit the orbit via the optic canal- into the middle cranial fossa to form the optic chiasm. 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)

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

Oculomotor Nerve (CNIII)

<i>General Type</i>	<p>Motor:</p> <p>Somatic motor-all extraocular muscles (except SO₄LR₆) and levator palpebrae superioris.</p> <p>Visceral motor (PS)- via ciliary ganglion to sphincter pupillae and ciliary muscles.</p>
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Oculomotor Nerve (CNIII) (cont)

<i>Course</i>	<ol style="list-style-type: none"> Emerges from midbrain- via posterior and middle cranial fossae- travels via superior part of lateral wall of cavernous sinus. Enters orbit via superior orbital fissure within common tendinous ring. Divides into 2 divisions: <ul style="list-style-type: none"> ● Superior- for SR + LPS ● Inferior- for IR, MR + IO Superior division runs on lateral side of the optic nerve and on inferior surface of SR piercing it to end up in LPS. 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.
<i>Distribution</i>	All extraocular muscles (except SO ₄ LR ₆), LPS, sphincter pupillae and ciliary muscles.
<i>Nerve Lesions</i>	No accommodation or light reflex (unilateral), eye deviated laterally, drooping of eyelid (ptosis) or pupil constantly dilated.
<i>Test for Integrity</i>	Accommodation or light reflex.

Trochlear Nerve (CNIV)

General Motor:
Type **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 Mixed:
Type **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 Sensory
Type

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 supratrochlear (to skin above medial canthus).
3. **Nasociliary**- 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)

<i>Corneal Reflex</i>	Afferent- from CNV1. Efferent- from CNVII.
<i>Nerve Lesions</i>	No corneal reflex or cannot feel area V1 supplies on face.
<i>Test for Integrity</i>	Touch area on face that V1 supplies or perform the corneal reflex.

Maxillary Nerve (CNV2)

<i>General Type</i>	Sensory
<i>Course</i>	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.
<i>Branches</i>	1. Meningeal. 2. Ganglion branches to PPG. 3. Infraorbital-



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