

Cranial Nerve Examination

Prepare patient

- Introduction
- Position sitting

General Inspection

General signs:

- Scars
- Facial asymmetry
- Neurofibromas
- Skin lesions e.g. Sturge-Weber

I - Olfactory Nerve

Ask patient if any problem with sense of smell

Use standard set of bottles of non-pungent odours

II - Optic Nerve

Ask patient to wear spectacles if he normally does

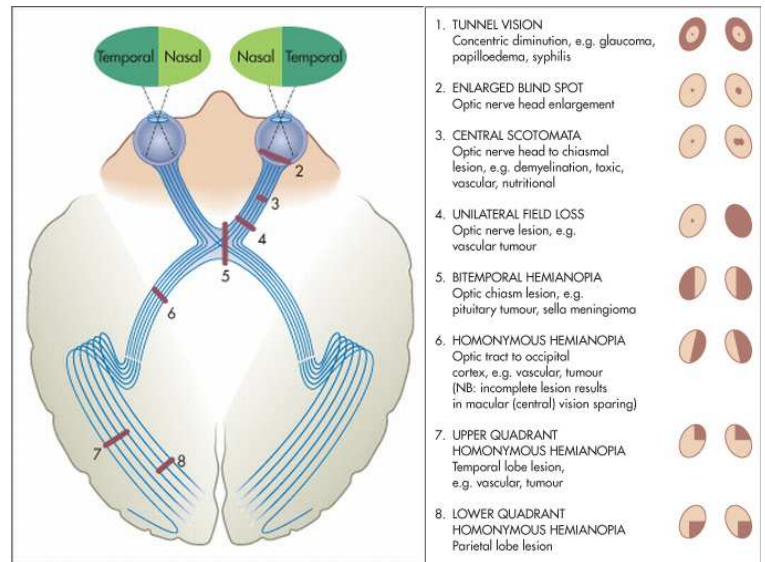
Visual acuity - one eye at a time with Snellen chart

Visual fields - one eye at a time by confrontation with finger moving.

Map blind spot (red pin).

Fundoscopy

- Red reflex
- Focus on eye from cornea to fundus - Start at +20 & reduce towards 0. Note cataracts.
- Fundi
 - Note colour, vessels, exudates, haemorrhages, retinitis pigmentosa, tears
 - Look at macula
 - Examine optic disc - atrophy, papilloedema



III - Oculomotor Nerve, IV - Trochlear Nerve, VI - Abducens Nerve

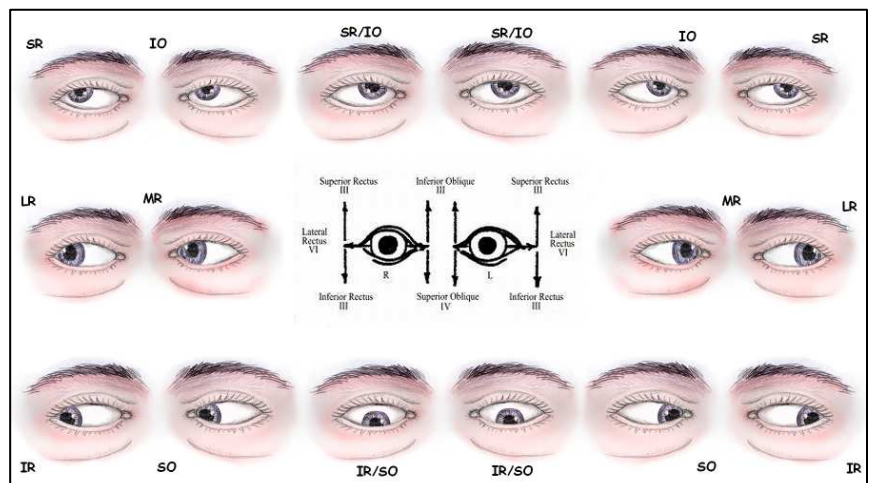
Note any ptosis, proptosis

Pupil

- Relative sizes & shape
- Reaction to light
- Relative afferent papillary (IIIn) defect (pupil dilates with direct light after consensual constriction)
- Accommodation

Eye movements

- Follow pin in "H" pattern to isolate/test individual muscles
 - Ask if any double vision



Normal eye movements and muscle/s tested with "H" pattern

- Summary of actions:
 - Medial rectus (MR, III) - adduction ("in")
 - Superior rectus (SR, III) - 1°: elevation, 2°: intorsion, 3°: adduction ("up & in")
 - Inferior rectus (IR, III) - 1°: depression, 2°: extorsion, 3°: adduction ("down & in")
 - Inferior oblique (IO, III) - 1°: extorsion, 2°: elevation, 3°: abduction ("up & out")
 - Superior oblique (SO, IV) - 1°: intorsion, 2°: depression, 3°: abduction ("down & out")
 - Lateral rectus (LR, VI) - abduction ("out")
- *A potentially confusing aspect is that in order to test muscles individually: SR & IR are tested with the eye **abducted** (even though one action of the muscle is **adduction**) and SO & IO are tested with the eye **adducted** (even though the one action of the muscle is **abduction**)!*
- CN palsy effects:
 - III - Eye is down & out, with dilated pupil unreactive to direct light, ptosis
 - IV - Eye elevated (hypertropia). Head tilted to unaffected side.
 - VI - Eye may be turned inward (esotropia). Head turns laterally on looking to affected side.
- Conjugate gaze abnormalities - gaze centres in frontal & occipital lobes connect to CN nuclei (III & IV in midbrain, VI in pons). Horiz conjugation relies on co-ordination between VI & III via the medial longitudinal fasciculus & vert by III & IV coord.
 - Deviation of both eyes to one side (causes: ipsilat frontal stroke or tumour, contralat brainstem lesion or contralat frontal epileptic stim)
 - Supranuclear palsy
 - E.g. Steele-Richardson (Vert & then horiz, EPE, neck rigidity, dementia)
 - Distinguished from CN palsy by:
 - Affects both eyes
 - Pupils often fixed & unequal
 - Usually no diplopia
 - Reflex movements (on neck ext/flexion) are intact

V - Trigeminal Nerve (Ophthalmic, maxillary & mandibular divisions)

Corneal sensation & reflex (afferent component)

Facial sensation (pin prick & light touch) in each division

Muscles of mastication (clench teeth, resist mouth closure)

Jaw jerk (increased in pseudobulbar palsy)

VII - Facial Nerve

Look up & wrinkle forehead (preserved in UMN lesion)

Tightly close eyes

Purse lips and blow out cheeks

Bare teeth

Grimace - contracting platysma

Corneal reflex (efferent component)

VIII - Vestibulocochlear Nerve

Whisper a number in one ear while distracting the other

Rinne's test - 256Hz tuning fork on mastoid process then next to EAM. Sound becomes louder unless conductive deafness.

Weber's test - 256Hz tuning fork on centre of forehead. If nerve deafness sound heard more on side of normal ear, if conductive deafness then sound heard more on affected side.

Hallpike test if vertigo

Examine external auditory canal/tympanic membrane if indicated.

IX - Glossopharyngeal Nerve

Gag reflex (sensory component)

Sensation to pharynx

X - Vagal Nerve

Elevation of soft palate - Say "Ahh"

Gag reflex (motor component)

XI - Accessory Nerve

Shrug shoulders against resistance

Turn head against resistance (right SCM turns head to left & vice versa)

XII - Hypoglossal Nerve

Examine for wasting or fasciculation of tongue

Tongue protrusion - deviation is towards the lesion if unilateral LMN

Multiple Cranial Nerve Lesions

Unilateral V, VII & VIII palsies suggest cerebellopontine angle lesion (tumour)

Unilateral IX, X & XI palsies suggest a jugular foramen lesion

Bilateral X, XI, XII suggest bulbar palsy if LMN changes or pseudobulbar palsy if UMN signs.

Weakness of eye & facial muscles esp with repetition suggests myasthenia.

Summary of Examination of Eyes

Sitting up	6. Exophthalmos Lid lag	Fundi
1. General inspection Diagnostic facies	7. Orbits and eyeball Palpate <ul style="list-style-type: none">tendernessbrow (for loss of sweating in Horner's syndrome)	<ul style="list-style-type: none">CorneaLensHumorColour of disc and state of cupRetina—vessels, exudates, haemorrhages, pigmentation etc
2. Eyelids Xanthelasma	9. Other Depends on findings, such as other cranial nerves, long tract signs, urine analysis (e.g. diabetes mellitus)	Pupils
3. Cornea Corneal arcus Band keratopathy Kayser-Fleischer rings	10. Neurological examination Acuity <ul style="list-style-type: none">Eye chart—each eye separately Fields <ul style="list-style-type: none">Pin confrontation—each eyeCentral vision	<ul style="list-style-type: none">Shape, sizeLight reflex—direct and consensualAssess for afferent pupillary defectAccommodation
4. Sclera Jaundice Pallor Injection		Eye movements
5. Ptosis		<ul style="list-style-type: none">III, IV, VI nerves—movement, diplopia, nystagmusGaze palsies (e.g. supranuclear lesions)Fatigability (myasthenia)Corneal reflex (V and VII)