

Cranial Nerves Examination

NB. You may be asked to only examine the visual cranial nerves (CN 2,3,4,6) or the bulbar cranial nerves (CN 9,10,12).

Introduction

- Wash hands, Introduce self, Patients name & DOB & what they like to be called, Explain examination and get consent

General Inspection

- **Patient:** patient well, posture etc
- **Around bed:** walking aids

CN 1 (Olfactory)

- Ask patient if they have noticed any change in smell

CN 2 (Optic)

Ask if they wear glasses. They should leave them on for acuity testing in a neurological exam.

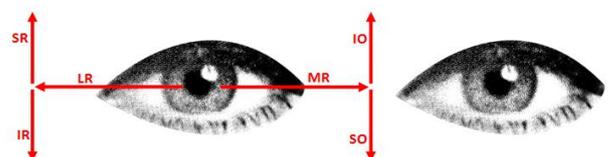
Mnemonic = **AFRO** (3 tests for each).

- **Inspection:** pupil size and symmetry; screening test – ask if they can see your whole face
- **Acuity:** Ask them to cover one eye with their palm to test each eye in turn.
 - Distant vision: use Snellen chart (reading is 'distance/smallest font size read' e.g. 6/9)
 - Near vision: read a line of a letter/magazine
 - Colour vision: "I would also like to test colour vision using Ishihara plates"
- **Fields**
 - Visual inattention: with both their eyes open focussed on you, hold your fists out laterally to each side. Ask them to point at the fist(s) which you are opening and closing (**inattention to one side = contralateral parietal lesion**).
 - Visual fields: sit the patient on the same level as you 1 meter directly in front of you. Get them to cover one eye with their palm and close your eye on the same side (without using your palm if you can). Ask them to stay focussed on your open eye. Using a white visual fields pin, bring it in from the periphery keeping it at mid-distance between you and the patient. Ask them to tell you when they can see it. Do this in a diagonal direction in each of the 4 quadrants only. Test both eyes, comparing their fields with yours (**monocular field loss = retinal damage or ipsilateral optic nerve lesion; bitemporal hemianopia = optic chiasm compression; left/right homonymous hemianopia = contralateral optic tract/radiation lesion (or occipital cortex if macular sparing)**).
 - Blind spots: in the way as visual fields (one eye at a time focussed on your eye), hold the red pin mid-distance between your open eyes. Check they can see it in the middle (**central scotoma = optic nerve lesion**). Check they can see it as red. Now move it horizontally towards the periphery and get them to tell you when it "disappears". Map their each of their blind spots to your own (**large blind spot = papilloedema**).
- **Reflexes**
 - Accommodation: ask the patient to focus on a distant object, and then ask them to focus on your finger close to their face. Pupils should constrict and eyes should converge.
 - Direct and consensual papillary reflexes: in a dimmed room, ask patient to hold their hand between their eyes and focus on a distant point in the room. Shine the light at each pupil in turn from about 45°. Observe for direct and consensual papillary constriction
 - Afferent defect (i.e. pupils are symmetrical but when light is shined in affected eye, neither pupils constrict) = optic nerve lesion
 - Efferent defect (affected pupil is persistently dilated, whilst other is reactive to light being shined in either eye) = CN3 lesion
 - Swinging light test for relative deficits: shine the light between the two eyes – the pupillary size should stay the same regardless of which eye the light is shined in. If pupils become more dilated when the light is shined in one of the eyes, then that eye is less sensitive to light and, hence, there is a relative **afferent** papillary defect (**partial optic nerve lesion on that side**).
- **Optic disc:** "I would also like to perform ophthalmoscopy to visualise the optic disc"

CN 3, 4, 6 (Oculomotor, Trochlear, Abducens)

Ask if they have any double vision and tell you if they experience any at any point.

- **Inspect:** strabismus, ptosis (**partial = Horner's; complete = CN3 lesion**)
- **H-test:** ask patient to keep their head still (you may need to hold a finger on their forehead) and, with both eyes open, follow



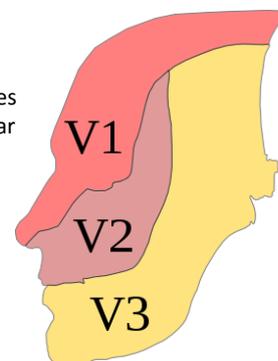
your finger. Make a H shape. Pause when they are looking laterally (**nystagmus = cerebellar lesion**). If there is complex ophthalmoplegia, ask them to look straight up and to count down from 20 (**fatigability = myasthenia**).

- **Saccades test:** ask the patient to look between a central and a peripheral target (e.g. your nose to your index finger) in the horizontal plane right/left and the vertical plane up/down (**saccades are jerky eye movements**)

Note: CN3 supplies all extra-ocular muscles except superior oblique (CN4) and lateral rectus (CN6) – mnemonic: **SO4LR6**
Hence, if an eye cannot move laterally, there is a CN6 lesion and, if the eye cannot move inferiorly when facing medially, there is a CN4 lesion. If the majority of the eye movements are impaired and the eye rests in a 'down and out' position, there is a CN3 lesion. If there is dramatically abnormal eye movements which do not fit with a single nerve lesion, there is complex ophthalmoplegia = myasthenia/Graves/mitochondrial/brainstem lesion).

CN 5 (Trigeminal)

- **Inspect:** temporalis/masseter muscle wasting
- **Sensory:** ask the patient if they have any areas of pins and needles or numbness. With patient's eyes closed, use a neurological pin (pain) to test sensation over the ophthalmic, maxillary and mandibular distributions of trigeminal nerve. Ask them to tell you when they feel it and if it feels the same on each side.
- **Motor:** ask the patient to clench the jaw and feel temporalis and masseter muscles. Ask them to open the jaw against resistance (masseter power).
- **Others:** "I would also consider testing the corneal reflex and jaw jerk"



CN 7 (Facial)

- **Inspect:** facial asymmetry
- **Motor** (forehead is spared in UMN lesions because the nucleus controlling the upper part of the face has bilateral UMN innervation)
 - Raise eyebrows
 - Scrunch up eyes + try to prise each open in turn with your thumbs
 - Purse lips together + try to prise each open in turn with your thumbs
 - Show teeth
 - Puff out cheeks + try to push air out

CN 8 (Vestibulocochlear)

- **Crude hearing test:** ask patient to occlude one of their ears and whisper a number. Start peripherally and move towards their ear and ask them to tell you the number when they hear it. Repeat on other side.
- **Weber's test:** use a 512Hz tuning fork. Twang the long ends and place the round base of the fork on the patient's forehead between their eyes. Ask them if one side is louder than the other (**if one side is louder, either that side has a conductive deficit, or the contralateral side has a sensorineural deficit - Rinne's test can then confirm which**).
- **Rinne's test:** use a 512Hz tuning fork. Twang the long ends and place the round base of the fork on the patient's mastoid process. Ask them to tell you when the sound stops. Then, place the long ends near the patient's ear. Ask them if they can then hear it again – air conduction should be louder than bone conduction (**if they cannot hear it again, there is a conductive deficit in that ear**).
- **Others:** "I would also consider performing vertigo tests such as walking on the spot and Dix-Hallpike test"

CN 9 & 10 (Glossopharyngeal, Vagus)

- **Inspect:** ask patient to open mouth and say "ahhh" and use pen torch to inspect palate symmetry (CN 9) and uvula deviation (CN 10) (**deviates away from lesion**)
- **Motor:** assess speech, cough and swallow
- **Others:** "I would also consider testing the gag reflex"

CN 11 (Accessory)

- **Inspect:** sternocleidomastoid/trapezius muscle wasting
- **Motor:** ask the patient to turn their head to each side against resistance (tests contralateral SCM muscle) and shrug their shoulders against resistance (tests trapezius).

CN 12 (Hypoglossal)

- **Inspect:** tongue while relaxed in mouth for muscle wasting and fasciculations (**LMN lesion i.e. bulbar palsy (pseudobulbar palsy is an UMN lesion)**)
- **Motor:** stick out tongue (**deviates to side of lesion**), move from side to side and test power by resisting tongue pressed into cheek

To complete

- Thank patient
- “To complete my exam, I would do a full upper and lower limb neurological examination”
- Summarise and suggest further investigations