

# Cranial Nerves Examination

NB. You may be asked to only examine the visual cranial nerves (CN2,3,4,6) or the bulbar cranial nerves (CN9,10,12).

## Introduction

- **W**ash hands, **I**ntroduce self, **P**atients name & DOB & what they like to be called, **E**xplain 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.

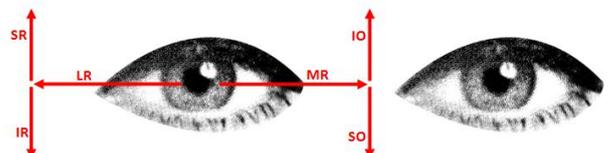
Mnemonic = AFRO (3 tests for each).

- **Inspection:** pupil size and symmetry
- **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 same position as visual fields, hold the red pin mid-distance between your open eyes. 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 blind spots on each eye 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 pupillary 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 pupillary constriction
    - Afferent defect (i.e. pupils are symmetrical but when light is shined in affected eye, neither pupils constrict) = CN2 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 pupillary defect (**partial CN2 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.

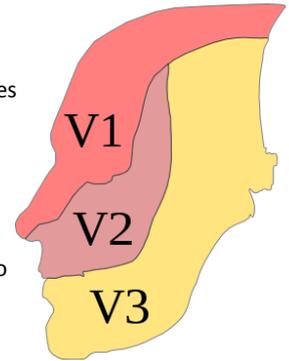
- **Inspect:** strabismus (CN3 lesion = pupil down & out; CN6 lesion = can't look laterally), ptosis (CN3 lesion/Horners)
- **H-test:** ask patient to keep their head still and, with both eyes open, follow your finger. Make a H shape. Pause when they are looking laterally (**nystagmus = cerebellar lesion**).



N.B. 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.

### 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 cotton wool bud (light touch) and 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 move the jaw side to side against resistance (masseter power).
- **Others:** "I would also consider testing corneal reflex, jaw jerk and the sensation on the anterior two thirds of the tongue"



### 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 open
  - Show teeth
  - Puff out cheeks + try to push air out
- **Others:** "I would also consider testing taste sensation on the anterior two thirds of the tongue"

### CN 8 (Vestibulocochlear)

- **Rough hearing test:** ask patient to occlude one of their ears and gently rub your index finger and thumb together. Move your hand from peripherally towards their ear and ask them to tell you 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:** palate and uvula symmetry
- **Motor:** assess speech, cough, swallow
- **Others:** "I would also consider testing the gag reflex and general and temperature sensation on the posterior third of the tongue"

### CN 12 (Hypoglossal)

- **Inspect:** tongue while in mouth (relaxed) 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; test power by resisting tongue pressed into cheek

### 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).

### To complete

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