Cranial Nerve Examination

Intro (WIIPPPPE)

- **W**ash your hands
- **I**ntroduce yourself and make sure to shake the patient's hand (weakness, neglect, slow grasp release in myotonic dystrophy)
- **I**dentity of patient (confirm)
- **P**ermission (consent and explain examination)
- **P**ain?
- **P**osition: sitting in chair 1m away from you. Ensure you are sitting at the same level as the patient.
- **P**rivacy
- **E**xpose head and neck

General Inspection

- Surroundings
    - Monitoring (ECG, bedside spirometry)
    - Treatments (eye patch, oxygen, IV infusions (e.g. ivig), NG tube, TPN
    - Paraphernalia (NBM signs, fluid thickener, walking aids, wheelchair, glasses, hearing aid)
- Patient
    - Well or unwell?
    - Speech difficulties?
    - Facial droop? Ptosis?
    - Wasting? Abnormal posturing?

Systemic examination

- **I - Olfactory**
    - Ask the patient if they have noticed any change in sense of taste/smell. If yes, check the nostrils aren't blocked and that the patient hasn't recently had a cold
    - Small can be formally assessed with smelling bottles (anosmia can be an early sign of Parkinson's disease)
- **II - Optic**
    - Acuity
        - Ask the patient to wear glasses/ contact lenses if needed to test best corrected visual acuity
        - Visual acuity is formally assessed using a standard Snellen chart at a distance of 6m: Ask the patient to cover each eye in turn (you may need to do this for them) ask the patient to read the smallest line of letters they can.
        - Informal testing involves asking the patient to read a word on e.g. your name-badge one eye at a time
        - If the patient cannot see the biggest letters on the Snellen chart or your badge with either eye, proceed in this order:
            - Counting fingers
            - Hand movements
            - Perception of light
        - If the patient sees nothing at all, the eye is said to have no perception of light (NPL)
    - **F**ields (and neglect)
        - Test peripheral visual fields by confrontation: the patient should look at your nose (and you at theirs). Ensure you and the patient are sitting at the same horizontal level, 1m apart with glasses off
        - Neglect

- Facing the patient ask them to look at your nose and keep their head still. Hold your hands approximately 60 cm apart and ask the patient to point to the finger that moves.
- Wiggle both index fingers at the same time. A patient with neglect will only note one finger moving.

▪ Peripheral fields
- Test each eye separately for central scotoma: can the patient see whole face.
- Ideally use white hat pin to test visual fields, each eye separately. If not, wiggling finger:
  - Start with your finger outside your own visual field and move towards the centre in well-defined increments). Test the four quadrants in each field.
- Central visual fields can be assessed with red hat pin (faded in optic neuritis) and central vision can be further assessed with Amsler grid
- Visual fields can be formally assessed using Goldmann kinetic perimetry and Humphrey visual fields testing

○ **R**eflexes (dim any ambient light)
▪ Pupil size, shape and symmetry
▪ Direct reflex (brisk or sluggish, equal or unequal)
▪ Consensual reflex
▪ Swinging light test for relative afferent pupillary defect (RAPD)
▪ Accommodation reflex (pupil constricts on near-vision)

○ **O**phthalmoscopy (dim or turn off any ambient light)
▪ Red reflex (15 degrees lateral to midline)
▪ Identify the optic disc (colour, margins, central retinal vein pulsation)
▪ Scan the retina (especially peripheries) by asking the patient to look toward 'up and left, up and right, down and left, down and right'. You will need to hold their eyelid up to see the retina on down gaze.
▪ Ask the patient to look directly at the light, this will mean you are looking directly at the macula.

○ Further tests (can offer but rarely done)
▪ Colour vision: Ishihara plates
▪ Blind spot: Assessed with red hat pin when papilloedema is suspected (expansion of blindspot)

- **III, IV, VI - Oculomotor, Trochlear, Abducens**
  - Primary position
    - Ask patient to fixate on tip of pen held 50cm in front of their nose
    - Inspect for ptosis, nystagmus, strabismus in the primary position
  - Diplopia
    - Ask about diplopia in the primary position
    - Ask patient to keep their head still and follow the tip of your finger in an 'H' pattern, telling you if they experience any pain or double vision
    - If any diplopia is noted try to match the associated lack of eye movement to a nerve lesion.
  - Smooth pursuit
    - Move your finger relatively rapidly from left to right and back again in the horizontal plane
    - Pause at extremes of gaze looking for nystagmus (pathological if >5 beats)
  - Saccadic eye movements:
    - Hold one finger 50cm in front of patient's nose and a fist 50cm lateral to the finger
    - Ask patient to move gaze rapidly between fist and finger in the lateral plane
    - Assess velocity and accuracy of these movements
- **V - Trigeminal**
  - Sensation

        - Test ophthalmic (V_1), maxillary (V_2) and mandibular (V_3) sensory branches with cotton wool
    - Motor
        - Inspect for masseter and temporalis wasting then ask the patient to clench their teeth to test power
        - Ask patient to open jaw and keep it open against resistance to test pterygoid power (look for jaw deviation towards side of lesion)
    - Reflexes
        - Corneal reflex (afferent: V_1, efferent VII)
        - Jaw-jerk (afferent: V_3, efferent: motor V)
- **VII - Facial**
    - Inspect (facial asymmetry)
    - Ask the patient to raise their eyebrows (forehead sparing in UMN lesion), scrunch up eyes, puff out cheeks, show teeth
- **VIII - Vestibulocochlear**
    - Whisper a number in each of the patient's ears in turn. Ask them to repeat it.
    - If hearing loss is detected, offer:
        - Rinne test (512Hz tuning fork)
        - Weber's test (512Hz tuning fork)
        - Otoscopy
        - Audiometry to formally assess hearing loss
- **IX, X - Glossopharyngeal, Vagus**
    - Assess speech quality and volume for hoarseness and quietness (dysarthria, dysphonia)
    - Ask the patient to open their mouth and say 'Ahhhh' (look palatal asymmetry and uvular deviation away from side of lesion)
    - Offer to test left and right gag reflex separately
    - If any speech difficulties or abnormal palatal sensation/ movement offer SALT assessment
- **XI Spinal accessory**
    - Ask the patient to shrug their shoulders and keep them there against resistance (trapezius)
    - Ask the patient to turn their head and push back against examiner's hand (sternocleidomastoid)
- **XII - Hypoglossal**
    - Inspect tongue at rest
        - Wasting and fasciculations in motor neuron disease
        - Tongue deviation towards side of lesion in LMN pathology
    - Test power of tongue against each cheek

Closure

- Thank the patient and ensure they are comfortable.
- Wash hands

Turn to examiner with your hands behind your back, holding stethoscope before saying:

- "**To complete my examination**, I would like to…"
    - Take a full history
    - Perform a full neurological examination of upper and lower limbs
- Do any further examinations/assessments based on findings
    - e.g. FVC, speech examination, Parkinsonian examination

Questions about the cranial nerve examination