University of BRISTOL
Bristol Medical School

Cranial nerve exam

To begin:

WIPE

- Wash hands
- Introduce self
- Identify patient
- Permission – gain consent for the exam
- Position – seated
- Pain – ask if the patient is in pain
- Privacy – ensure curtains/doors are closed
- Exposure – access to head and neck

General inspection and active observation

Patient:

Look for	**Example of why**
General appearance	See if the patient is alert, in pain, generally appearing well or unwell
Face	Asymmetry, wasting
Eyes	Pupil asymmetry, ptosis, position of eyes at rest

Around the bed:

Look for	**Examples of why**
Treatments/medications	Oxygen, IV fluids, other medication, nil by mouth signs
Patient equipment	Walking aids, glasses, hearing aids
Observation chart	Note the patient's current status and NEWS score. If there are no up-to-date observations consider taking a full set of observations.

Cranial nerves

Cranial nerve	Examine	Assessing for / associated with
Olfactory (I)	Ask if change of sense of smell or taste *Offer to assess with scent kit*	Viral infections, idiopathic Parkinson's disease, local nasal or sinus disease, post-head injury or frontal skull base tumour such as meningioma
Optic (II) **AFRO**	**Acuity** Ask if they have had any change in their vision recently Grossly test one eye at a time, reading e.g. name badge *Offer to formally assess with Snellen chart* Nb. Correct for refractive errors with glasses or pinhole	
	Fields Covering the same eye as the patient is, with the patient facing you, ask them to focus on your face and not move their eyes. Start from the periphery and slowly bring your finger in towards the centre, comparing your visual field with the patients. Ask the patient when they first see the finger appear in their vision. Repeat this with all four corners of their visual fields.	Visual field defects and the pattern of that defect, which relates to the anatomical location of the lesion to the optic pathway: -Monocular e.g. optic nerve/retinal problem -Bitemporal hemianopia e.g. defects of optic chiasm such as pituitary adenoma -Homonymous hemi/quadrantinopia e.g. lesion of optic tract / radiation / occipital lobe such as from a stroke or tumour

	Reflexes Pupillary reflex – test direct and consensual reflex in both eyes Swinging light test for relative afferent pupillary defect (RAPD) – shine light in one eye for 3 seconds, then move to other eye, and repeat. If CNII defect affected eye dilates as light moves from the normal eye to the affected eye as less light is perceived by the damaged pathway. Accommodation reflex – hold object ~30cm from patient's face. Ask patient to focus on a far object, then near object, looking for eyes converging and pupil constriction	Pupillary abnormalities e.g. "surgical" 3rd nerve palsy, Horner's syndrome RAPD associated with optic nerve pathology e.g. optic neuritis, optic atrophy Nb. Pupillary reflex requires both CN II (sensory input), and CNIII (constriction of pupil)
	*Offer **ophthalmoscopy***	*Assessing disc colour, disc margins and for any other findings e.g. haemorrhages, cotton wool spots, exudates, new vessel formation*
Oculomotor (III), trochlear (IV), abducens (VI)	Observe the fixed position of the eyes (at rest) Test extra-ocular eye movements using "smooth pursuit" – with the patient facing you draw a 'H', asking the patient to follow with their eyes only. Ask if they have any pain or double vision. Look for nystagmus. Saccades – Ask patient to quickly focus between two objects e.g. finger and pen	Extra-ocular eye movements: consider cranial nerve palsies (3, 4, 6) e.g. "down and out" eye in 3rd nerve palsy. Internuclear ophthalmoplegia (INO) – failure of adduction with horizontal nystagmus of other eye caused by damage to medial longitudinal fasciculus (often seen in MS)

		Look for the smoothness of the pursuit, can be abnormal in cerebellar disease Look for any deficits during saccadic movements e.g. slow, overshoot, undershoot associated with cerebellar dysfunction Nystagmus: describe the direction of the fast phase and note whether unidirectional or multidirectional. Associated with peripheral and central causes.
Trigeminal (V)	**Sensation** Touch patients' face on left and right side of forehead (V1), cheek (V2) and chin (V3) with cotton wool. Compare left and right, ask if feels normal.	
	Motor Put hands over angle of jaw and ask patient to clench jaw, examining muscle bulk. Repeat putting hands over temples	Weakness of muscles of mastication supplied by V3
Facial (VII)	Looking for asymmetry, drooping etc. ask the patient to: • Raise eyebrows • Close their eyes tightly, don't let you open them • Puff out their cheeks, don't let you push them in	Facial weakness due to: • LMN facial nerve palsies causing a complete facial weakness (incl. eyebrows)

	• Show their teeth/grimace	• UMN palsies spare the eyebrows as the upper face has bilateral innervation to frontalis and orbicularis oris
Vestibulo-cochlear (VIII)	With the patient's eyes closed, mask the ear you are not testing by pressing gently on the tragus. Whisper 3 words or numbers in the ear you are testing and ask them to repeat the number back.	
	Offer Rinne's & Weber's tests only if hearing loss noted. *Weber's – 512 Hz tuning fork placed on their forehead at midline. Lateralising towards conductive hearing loss and away from sensorineural hearing loss.* *Rinne's – 512 Hz tuning fork placed on their mastoid process, ask the patient to tell you when they hear it stop. Then place the fork outside their ear and ask if they can still hear it. Normal = can still hear it when moved to air conduction.* *Note: Modified Rinne's is also acceptable - 512 Hz tuning fork placed on their mastoid process ~2s, then moved in front of their ear, ask them if it is louder in front of their ear or behind. Expect air conduction > bone conduction*	*Use the pattern of results from both tests to identify whether the defect is conductive or sensorineural and affecting which ear.* *Conductive e.g. excess wax, "glue ear", otosclerosis* *Sensorineural due to damage of inner ear or nerve e.g. acoustic neuroma, genetic causes of deafness, drugs* *Note: When conducting Weber's test, 40% of people with normal hearing will lateralise, so this can only be interpreted in patients with hearing loss.*
	Offer otoscopy	

	Nerve has 2 divisions; Cochlear (hearing), Vestibular (balance). Only cochlear division is tested here.	
Glossopharyngeal (IX), vagus (X), hypoglossal (XII)	Ask patient to open mouth and say 'aaaah', looking for asymmetry, uvula deviation, tongue wasting /fasciulations, listening for hoarseness of voice Ask patient to stick out tongue and move it side to side, looking for deviation, fasciculations etc. and then test strength of tongue by asking patient to push inside the mouth against cheek	
Accessory (XI)	Ask patient to shrug shoulders, don't let you push them down Ask patient to look left, place hand on their cheek and ask them to look forward again against resistance. Examine the sternocleidomastoid. Repeat on the other side.	Weakness of the trapezius or sternocleidomastoid muscles

To finish

- Ensure the patient is dressed and comfortable
- Wash hands