

CLINICAL SKILLS: CRANIAL NERVE EXAMINATION

The cranial nerve examination has the most complicated structures of all the physical examinations as it is based on the anatomical sequence of cranial nerves, rather than function. Therefore, it is vital that you know the correct sequence, names, and functions of the cranial nerves BEFORE embarking on trying to master this examination.

*We have tried to represent a comprehensive cranial nerve examination, though the **technique** involved in these actions requires demonstration by an experienced clinician, and lots of practice. If you have any good online resources (videos/diagrams/tutorials) for any of specific points below then please post them as a comment at the bottom!*

- **Wash your hands**
- **Introduce yourself**
- **Tell the patient that you would like to examine the nerves in their head and neck**
- **Ask if they are happy to do this**
- **Reposition the patient sitting down**

- Ensure you have the correct equipment: cotton wool, 512Hz tuning fork, tendon hammer, pen torch (plus optional: Snellen chart, Ishihara plates, ophthalmoscope)
- You should sit down opposite them so you are both at eye level with each other.
- Inspect patient as a whole first, looking for any obvious abnormalities, such as a facial droop or ptosis
- Then proceed to examine the patient's cranial nerves individually, as below;

No.	Nerve name	Nerve examination
I	Olfactory	<p>Ask the patient whether they have noticed any change in their sense of smell recently?</p> <p>You can test this nerve objectively by testing each nostril individually with coffee. Do NOT offer to use ammonia to test the Olfactory nerve as noxious smells will also stimulate the Trigeminal nerve.</p>
II	Optic	<p>Assess:</p> <ul style="list-style-type: none"> • Visual acuity with a Snellen chart (see visual acuity station) • Colour recognition (using Ishihara plates) • Fundoscopy (see ophthalmoscopy station) • Pupillary reflexes to: <ul style="list-style-type: none"> LIGHT - in a dimly lit room, shine a bright light into the left eye, and check for ipsilateral (same sided) and contralateral (opposite side) pupil constriction. A defect could indicate nerve II or III pathology. A relative afferent pupillary defect (RAPD) is when there is inappropriate pupillary dilation when there is rapid transition from light in the contralateral to ipsilateral eyes. This could indicate early/partial afferent (nerve II) damage. ACCOMODATION - ask the patient to focus on a distant spot, then change focus to your finger (15cm in front of their face). Their pupil should constrict to focus.

		<ul style="list-style-type: none"> • Convergence - "look at a distant object, now look at my finger" (positioned 15cm away from eye). Do both eyes converge to focus on the near object? • Visual fields: <ol style="list-style-type: none"> 1. Ask the patient to keep both eyes open. Hold your hands at the periphery of their vision and wave each hand in turn each time asking the patient to state which hand is waving. Then wave both hands to ensure the patient identifies both hands as moving. If there is error, this could indicate a visual field deficit, or 'visual neglect'. 2. Then ask them to cover one eye and fix their gaze on your nose, keeping their head still. Hold one of your fingers in the upper outer quadrant of their visual field and move it towards the centre asking the patient to identify the point at which they first see the finger/pin. Repeat this for the other 3 quadrants and then repeat with the other eye. 3. Using a red pin mark out the patient's blind spot. Ask them to cover one eye and fix their gaze on your nose. Hold the pin at the lateral periphery of their vision in the horizontal plane and then move the pin slowly medially and continuing in the horizontal plane asking the patient to identify when they first see the pin, when it disappears and when it reappears. This will map their natural 'blind spot'. Is it bigger than yours?
III IV VI	Occulomotor Trochlear Abducens	<p>Move finger in a large 'H' shape across the patient's field of vision and ask patient to follow finger whilst keeping their head still. Look at movements of eyes - are they able to look in all directions? Ask if patient can see double or if vision is blurred at any point during the test (this indicates inadequate visual alignment).</p> <p>To test for nystagmus, ask the patient to focus on the tip of your finger. Hold your finger at the left lateral edge of their visual field, and move it rapidly to the right lateral edge of their visual field and hold it there. Do they show nystagmus? 2-3 beats is acceptable; more than this indicates pathology. Carry out the reverse (right to left) movement. Also, do they have nystagmus movements when focusing in the centre of their visual field (this is normally pathological)?</p>
V	Trigeminal	<p>Test sensation first</p> <ul style="list-style-type: none"> • Test sensation on the sternum with cotton wool first. Tell them you will do the same on their face, and ask patient to close eyes and tell you when they feel the cotton wool. • Press (don't rub) the cotton wool in the distribution of the ophthalmic (forehead), maxillary (cheek) and mandibular (jaw) nerves. Test like for like bilaterally before moving on to the next region. • Ask them if it feels the same on both sides? <p>Then test motor system:</p> <ul style="list-style-type: none"> • Offer to test the corneal reflex. It is commonly believed that Corneal reflex should not be performed due to discomfort caused to the patient, however, examiners are frequently asking candidates to perform this test. It is not a painful test if you do it properly. Lightly dab cotton wool on the cornea (not pupil) and the patient should blink. • Jaw jerk reflex - tap the tendon hammer onto your finger held onto a relaxed jaw (normal if not present). • Ask the patient to clench their jaw - feel temporalis and masseter muscles for contraction (over the cheek). • Open jaw to resistance (try to push their jaw up).

VII	Facial	<p>Ask patient to do the following (unopposed, and then against resistance), and check for symmetry:</p> <ul style="list-style-type: none"> • Raise their eyebrows • Close their eyes tightly • Hold their lips together and blow out their cheeks <p>Then ask them to smile and show their teeth.</p>
VIII	Vestibulocochlear	<p>'Screening' - rub fingers together by one ear, and whisper a two-digit number (e.g. 72) by the other. Ask the patient to repeat the number back to you. This is obviously dependent on how softly you whisper.</p> <p>Specific tests (using a 512Hz tuning fork): Weber's Test and Rinne's Test (see Ear Examination for details)</p>
IX X	Glossopharyngeal Vagus	<ul style="list-style-type: none"> • Ask the patient to open their mouth and say 'ahh' - look at uvula (the uvula would deviate away from the side of any cranial nerve lesion) • Tell the examiner you would like to examine the gag reflex (with an orange stick) - you will probably not be asked to do it, as it is uncomfortable for the patient • Assess the patient's swallow by asking them to swallow a sip of water - ask them to talk afterwards and assess for gurgling or coughing suggestive of poor swallow
XI	Accessory	<p>Ask the patient to shrug their shoulders, and then resist your attempts to push their shoulders down. Is this symmetrical?</p> <p>Put your flat palm on one side of the patient's face and ask them to turn their head against your hand. Is this symmetrical?</p>
XII	Hypoglossal	<p>Ask the patient to open their mouth wide:</p> <ul style="list-style-type: none"> • Inspect the tongue for fasciculations at rest • Ask the patient to stick out their tongue straight - if there is deviation towards one side then this would indicate a cranial nerve XII lesion on that side

- Thank the patient and wash your hands
- Turn to the examiner and explain that you would like to finish your examination by:
 - Examining [speech](#)
 - Examining [swallow](#)
 - Examining the nerves of the [upper limbs](#) and [lower limbs](#)