

The Practical Neurological Examination, Part 2

ASSESSMENT OF CRANIAL NERVES

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Of the six components of the neurological examination, the cranial nerve examination is perceived as being the most complicated and thus the most difficult and time consuming. In truth, the examination is indeed the most complicated, but complicated does not always equate with difficulty or time commitment. Initial screening of the cranial nerves can actually be relatively easy.

Ease in performing the assessment is associated with a common-sense approach that - much like the one taken in the earlier description of assessing mental status [[Part 1, Feb. 12 issue](#)] - relies heavily on observations. A good general screening of the cranial nerves can be performed while observing the patient during the course of a conversation (case history) and understanding the likelihood of pathology for some of the nerves.

Cranial Nerves 1-2

The first cranial nerve (olfactory nerve) is seldom tested in general screening examination. In fact, the bullet system for current procedural coding (CPT) does not recognize the first cranial with a bullet. This is also true for the 10th cranial nerve (vagus nerve). The most common reasons for diminished sensation of the first cranial nerve are [cold](#), [flu](#), [sinus trouble](#) and the natural loss of the ability to smell that occurs with aging. Isolated lesions of the 10th cranial nerve are rare.

The second cranial nerve (optic nerve) deals with sight. If the patient is wearing glasses or contacts, the examiner is alerted immediately to refractive problems of the eye. The patient's ability to drive to the office, read paperwork and navigate through the office are also clues.

Cranial Nerves 3-6

Cranial nerves three, four and six (oculomotor, trochlear and abducens nerves) deal with movement of the eyes. It is easy to observe if the eyes move together in a coordinated manner during a conversation, making converging strabismus and diverging strabismus easy to detect. Cranial nerve three also deals with pupil size and elevation of the eyelid. If the patient has pupils of unequal size and/or has ptosis, then a lesion of the third cranial nerve should be suspected.

The fifth cranial nerve (trigeminal nerve) provides sensation for the face and innervates muscles of mastication. Patients with altered sensation of the face are likely to notice the abnormality quickly and report it. People touch their faces frequently during the course of a day. They wash their face, brush their teeth, apply makeup, shave, wear glasses, blow their nose, eat, etc. Numbness and abnormal sensations are usually noticed during these activities. Patients are likely to report these findings as part of their recent history. In some cases, numbness may be a result of a previous facial surgery, which should also be reported during the history process.

If the patient is having trouble chewing, the muscles of mastication may be involved. A report of trouble should result in the examiner looking for [dental and/or TMJ causes](#) for the trouble.

Cranial Nerve 7

The seventh cranial nerve (facial nerve) innervates the muscles of facial expression. It also assists the ninth and 10th cranial nerves (glossopharyngeal and vagus nerves) with the sensation of taste. As for taste, a decreased sense of taste may be reported by the patient, but like the sense of smell, the sensation decreases gradually with normal aging.

Muscles of facial expression can be observed functioning during the conversation. Smiling, frowning, speaking, blinking, raising the eyebrows and other facial movements are easily observed. Common pathologies associated with facial muscle (seventh cranial nerve) dysfunction, Bell's palsy and stroke are easily discerned by noting if the dysfunction involves the entire face (Bell's) or only involves function below the eyebrows (stroke).

Cranial Nerve 8

The eighth cranial nerve (vestibulocochlear nerve) is mostly sensory, providing hearing and equilibrium. If the patient can hear and understand the examiner's questions and instructions, then hearing is generally good. A hearing aid is also a good indicator of eighth cranial nerve function.

Dizziness or spinning sensations may be reported if [equilibrium is abnormal](#). If the patient can get up and down, stand and walk with a steady gait, then equilibrium is probably intact.

Cranial Nerves 9-10

As mentioned earlier, the ninth and 10th cranial nerves deal with taste. They also deal with phonation and swallowing. If the patient reports voice changes or an unusual voice tone, then further questioning is warranted. Reports of difficulty with swallowing should also be investigated further.

Cranial Nerves 11-12

The 11th cranial nerve (accessory nerve) innervates the sternocleidomastoid and trapezius muscles that move the head and shoulders. The posture and turning of the head, and shrugging of the shoulders during conversation are clues to function of the 11th cranial nerve.

The 12th cranial nerve (hypoglossal nerve) innervates the tongue. Like the ninth and 10th nerves, it controls swallowing. Most important is its role in articulation of speech. Clear pronunciation during the history process and other conversations is the key to identifying proper function of the tongue and 12th cranial nerve.

The observations described above if normal, could be stated in the patient record by saying, "Cranial nerves are within normal limits by history and observation." If this is stated, the doctor must be able to explain the observation related to each nerve.

If there are abnormalities detected or a more detailed examination is warranted, the doctor should perform a more extensive examination of the 12 cranial nerves.

Resources

- Ross RT. *How to Examine the Nervous System, 4th Edition*. Humana Press: Totowa, NJ, 2006.
- *E/M Coding Made Easy, 4th Edition*. PMIC, 2006.
- Goldberg S. *The Four Minute Neurological Exam*. MedMaster, Miami, FL, 2004.
- Ferezy JS. *Chiropractic Neurological Examination*. Aspen Publications: Gaithersburg, MD, 1992.
- Fuller G. *Neurological Examination Made Easy, 3rd Edition*. Churchill Livingstone:

Edinburgh, 2004.

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