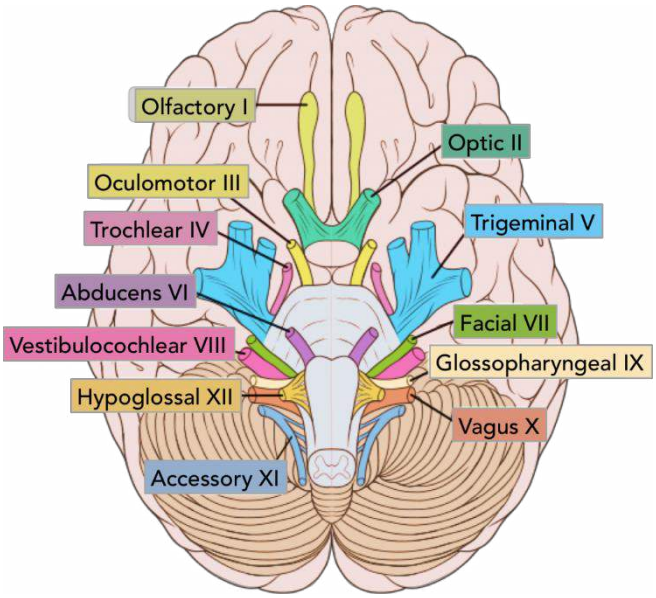
LexiMed
Medicolegal Specialists

Cranial Nerves

There are twelve pairs of cranial nerves, which emerge directly from the brain. The first two nerves (olfactory and optic) arise from the cerebrum, whereas the remaining ten nerves emerge from the brainstem. The cranial nerves lead directly from the brain to various areas of the head, neck and trunk. Some of the cranial nerves are responsible for our senses such as hearing, vision and smell, whilst others regulate glands and control muscles in our face.

Doctors tend to refer to the cranial nerves by their number, from one to twelve, listed as a Roman numeral.



Functions of the Cranial Nerves

Number	Cranial Nerve	Major Functions
I	Olfactory	Sense of smell
II	Optic	Vision
III	Oculomotor	Eyelid and eyeball movement Pupil constriction
IV	Trochlear	Innervates superior oblique muscles Turns eye downward and laterally
V	Trigeminal	Chewing Receives sensation including touch and pain from the face and head
VI	Abducens	Turns eye laterally
VII	Facial	Controls muscles used in most facial expressions Secretion of tears & saliva Taste (anterior two thirds of the tongue)
VIII	Vestibulocochlear (auditory)	Hearing Balance Equilibrium sensation
IX	Glossopharyngeal	Taste (posterior one third of the tongue) Controls some muscles used when swallowing Senses carotid blood pressure
X	Vagus	Senses aortic blood pressure Slows heart rate Stimulates digestive organs Taste
XI	Accessory	Controls trapezius and sternocleidomastoid muscles Controls swallowing movements
XII	Hypoglossal	Controls tongue movements

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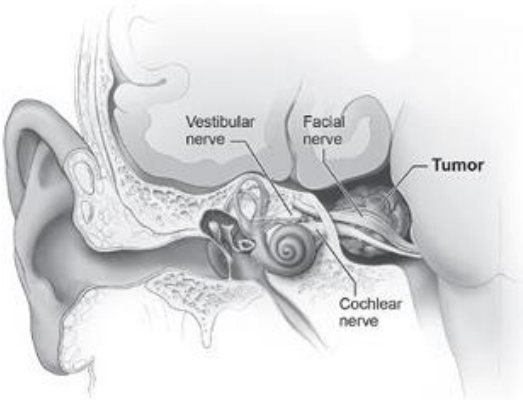
Cranial Neuropathy

An irritated or injured nerve causes a neuropathy. How the body is affected by the neuropathy depends on which nerve has been injured. When the cranial nerves are affected, you have a cranial neuropathy. There are many causes of cranial neuropathy including trauma, tumours, inflammation, infections for example Lyme disease, drugs and toxins.



Symptoms

The presenting symptoms of a cranial neuropathy will depend on which nerve was injured and how it was injured. The table below gives an overview of common symptoms that are experienced when each cranial nerve is injured.

Number	Cranial Nerve	Pathological Features
I	Olfactory	Unilateral anosmia (loss of sense of smell)
II	Optic	Unilateral vision loss
III	Oculomotor	Ptosis (drooping or falling of the upper eyelid) Eye deviated laterally and downward Diplopia (double vision) Dilated and non reactive pupils Loss of accommodation
IV	Trochlear	Inability to move eye downward and laterally Diplopia Head tilt toward unaffected eye
V	Trigeminal	Partial facial anaesthesia Periodic lancinating facial pain (trigeminal neuralgia)
VI	Abducens	Diplopia Inability to move affected eye laterally
VII	Facial	Hemifacial paralysis (Bell's palsy) Abnormal taste Sensory deficit around ear Sensitivity to loud sounds
VIII	Vestibulocochlear (auditory)	Vertigo Tinnitus (ringing or buzzing in ears) Unilateral hearing loss
IX	Glossopharyngeal	Intermittent pain in the pharynx (rare)
X	Vagus	Loss of palate rise Dysphagia (difficulty or discomfort when swallowing) Hoarse voice
XI	Accessory	Shoulder drop and downward displacement of scapula
XII	Hypoglossal	Tongue deviations

Diagnosis

Cranial neuropathies are diagnosed using a range of clinical and radiological tests. The type of testing that is performed depends on the presenting symptoms but can include Magnetic Resonance Imaging (MRI) Scans, Computed Tomography (CT) Scans, hearing tests, nerve conduction studies and a clinical neurological examination.

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Treatment

Treatment for conditions affecting the cranial nerves varies and can include medication and, or surgery. Treatment will often be aimed at the cause of the cranial neuropathy, for example the infection or the inflammation.

LexiMed Consultants

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Reference:
https://www.hopkinsmedicine.org/healthlibrary/conditions/nervous_system_disorders/multiple_cranial_neuropathies_134,48

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