

Cranial Nerve	Location	Type	Function	Lesion Symptoms	Test
I. Olfactory	Inferior frontal lobe	Sensory	+ Sense of smell; + Contributes to taste.	-Inability to smell.	** Scent identification.
II. Optic	Diencephalon	Sensory	+ Sense of sight; + Afferently involved in reflexive pupil response (with CN III); + Senses light and dark; + Orients the head and eyes.	-Ipsilateral blindness; -Loss of afferent info for pupillary light reflex.	** Pupillary light reflex; ** Visual field test.
III. Oculomotor	Anterior midbrain	Motor	+ Moves pupil up, down, and medially; + Raises upper eyelid; + Efferently involved in reflexive pupillary constriction responses (with CN II).	-Loss of efferent control of pupillary light reflex. -Loss of consensual light response; -Ptosis; -Ipsilateral eye = out + down; -Diplopia; -Deficient movement medial, down, and up; -Loss of pupil constriction to focus on nearby objects.	** Pupillary light reflex; ** Pupil symmetry; ** Pupillary response to objects near and far; ** Convergence; ** Forward gaze; ** Cover tests; ** Smooth pursuit eye movement; ** Voluntary saccades; ** Optokinetic nystagmus; ** Dynamic visual acuity; ** Nystagmus; ** Upper eyelid position and raising.
IV. Trochlear	Posterior midbrain	Motor	+ Innervates the superior oblique muscle; + Moves pupil down and medially.	-Ipsilateral eye can't look down and in (denervation of superior oblique muscle); -Diplopia; -Reading difficulty; -Visual problems when descending stairs.	** Forward gaze; ** Cover tests; ** Smooth pursuit eye movement; ** Voluntary saccades; ** Optokinetic nystagmus; ** Dynamic visual acuity; ** Nystagmus.

V. Trigeminal	Lateral pons	Both	+ Sensory: Touch, proprioception, nociception, temp from face + TMJ + anterior 2/3 tongue + sinuses + meninges; + Sensory: Afferent limb of corneal reflex. + Motor: Involved with speech as the jaw is involved in sound articulation; + Motor: Chewing (muscles of mastication and tensor tympani muscles).	-Anesthesia of denervated area (depends on branch); -Dysphagia; -Ophthalmic: Blink reflex impacted; -Mandibular: Jaw deviates to involved side with mouth open; -Dysarthria; -Trigeminal Neuralgia = severe, sharp, stabbing pain.	**Ophthalmic: Blink reflex/Corneal reflex (serves as afferent limb); **Mandibular: Masseter reflex; ** Jaw deviation + closing; ** Light touch; ** Sharp vs. dull.
VI Abducens	Between pons + medulla	Motor	+ Innervates the medial rectus muscle for abducting the eye.	-Eye = inward (paralysis of medial rectus muscle); -Diplopia.	** Forward gaze; ** Cover tests; ** Smooth pursuit eye movement; ** Voluntary saccades; ** Optokinetic nystagmus; ** Dynamic visual acuity; ** Nystagmus.
VII. Facial	Between pons and medulla	Both	+ Sensory: Posterior + external ear canal; + Sensory: Anterosuperior ear; + Sensory: Sense of taste from anterior 2/3rds of tongue. + Motor: Facial expression muscles (impacts speech function as sounds are partly articulated with the lips); + Motor: Stapedius muscle; + Motor: Glands in the head (lacrimal/tears + all salivary glands except the parotid/salivation + nasal); + Motor: Blink/Corneal reflex; + Motor: Closes eyes.	-Paralysis/Paresis of ipsilateral facial expression muscles; -Dysphagia; -Dysarthria; -Bells Palsy (paralysis of orbicularis oculi and frontalis muscles); -Ramsay Hunt Syndrome (acute facial paralysis with ear pain and blisters on external ear which also impacts CN VIII).	**Blink reflex/Corneal reflex (serves as efferent limb); ** Screen: Eyebrow raising, eye closing, smiling, puffing out cheeks, closing lips.
VIII. Vestibulo-cochlear	Between pons + medulla	Sensory	+ Vestibular: Head position relative to gravity and head movement; + Cochlear: Sense of hearing.	-Loss of hearing which impacts ability to locate sounds; -Sensorineural or conductive deafness; -Tinnitus; -Impacted by Ramsay Hunt Syndrome (acute facial paralysis with ear pain and blisters on external ear which also impacts CN VII).	*Vestibulo-ocular reflex (serves as afferent limb); * Finger rub hearing; * Rinne test; * Weber test; * Past pointing test.

IX. Glossopharyngeal	Medulla	Both	+ Sensory: Soft palate and pharynx; + Sensory: Afferent gag and swallowing reflex; + Sensory: Sense of taste from posterior 1/3rd of tongue; + Sensory: Carotid artery (BP and chemical info); + Sensory: Middle ear + near external ear canal. + Motor: Pharyngeal muscle; + Motor: Swallowing; + Motor: Parotid salivary gland (salivation).	-Decreased salivation; -Dysphagia; -Afferent loss for gag reflex; -Afferent loss for swallowing reflex.	**Gag reflex (serves as afferent limb); **Swallowing reflex (serves as afferent limb).
X Vagus	Medulla	Both	+ Sensory: Skin in center of external ear; + Sensory + Motor: Larynx, Pharynx, Viscera (thorax, abdomen); + Motor: Connections parasympathetically influence HR, digestion, and bronchi; + Motor: Impacts speech production (sound is generated in larynx and begins to be articulated in the soft palate); + Motor: Regulates swallowing (efferent gag + swallowing reflex).	-Dysarthria; -Hoarseness; -Dysphagia; -Poor digestion; -Asymmetrical soft palate elevation.	**Gag reflex (serves as efferent limb); **Swallowing reflex (serves as efferent limb); ** "Ah" test.
XI. Spinal Accessory	Spinal cord + medulla	Motor	+ Innervates Trapezius; + Innervates SCM; + Elevates shoulders and turns head.	-Paralysis of Traps and SCM; -Paresis if the upper motor neuron/motor tract is impacted.	** Strength screen of SCM and traps.
XII Hypoglossal	Medulla	Motor	+ Innervates ipsilateral tongue muscles (intrinsic and 3 extrinsic). + Moves tongue; + Involved with speech production as the tongue is used in sound articulation.	-Ipsilateral tongue atrophy; -Tongue pulls ipsilaterally to lesion; -Dysarthria; -Dysphagia.	** Tongue protrusion; ** Tongue manual resistance.

Helpful Notes

Cranial Nerve Names: "On occasion, our trusty truck acts funny – Very good vehicle anyhow."

Type of Nerve: "Some say money matters, but my brother says big brains matter more."

