

Summary

Part of Brain stem	Motor Column Nuclei			Sensory Column Nuclei			
	G.S.E.	G.V.E. parasympathetic	S.V.E. Pharyngeal arches	G.V.A.	S.V.A.	G.S.A.	S.S.A.
Medulla oblongata	Hypoglossal Nucleus XII	Dorsal motor nucleus of Vagus	Nucleus Ambiguus	Solitary Nucleus			Medial, Lateral & inferior vestibular nuclei Dorsal & ventral cochlear nuclei
		Inferior Salivary Nucleus				Spinal nucleus of trigeminal nerve	
Pons	Abducent Nucleus VI	Superior salivary nucleus	Motor nuclei of trigeminal & facial nerves		Solitary Nucleus	Spinal nucleus & Main sensory & Mesencephalic nuclei of trigeminal nerve	Superior vestibular nucleus
Mid brain	Oculomotor & Trochlear Nuclei III & IV	Edinger-Westphal Nucleus				Mesencephalic nucleus of trigeminal nerve	

Special Sensory Cranial nerves 1, 2 & 8

Nerve	Function	Origin	Peripheral distribution	Central connection	Lesion
I- Olfactory	Smell	Olfactory epithelium	Superior concha & upper nasal septum	Olfactory bulb	Anosmia
II- Optic	Vision	Retinal ganglion cells	Retinal bipolar cells	Lateral geniculate nuclei	Blindness
	Light reflex (afferent limb)			Pretectal nuclei	Loss of pupillary constriction
VIII- Vestibular part	Balance	Vestibular ganglion	Maculae of utricle & saccule	Vestibular nuclei	Dysequilibrium
	Vestibulo-ocular reflex (afferent limb)		Cristae of semicircular ducts		Loss of Vestibulo-ocular reflex
VIII- Cochlear part	Hearing	Spiral ganglion	Spiral organ	Cochlear nuclei	Deafness

Ocular Motor Nerves 3, 4 & 6

Nerve	Function	Origin	Peripheral Distribution	Lesion
III- Oculomotor	Eye movement	Oculomotor Nucleus	All extraocular muscles except LR6 & SO4	Ophthalmoplegia, the eye turned down & out
	Elevation of upper eyelid		Levator palpebrae superioris	Ptosis
	Pupillary constriction & accommodation	Edinger-Westphale nucleus	Ciliary ganglion to sphincter pupillae & ciliary muscle	Mydriasis & loss of accommodation
IV- Trochlear	Eye movement	Trochlear nucleus	Superior oblique muscle	Diplopia, weakness of adducted eye
VI- Abducens		Abducens nucleus	Lateral rectus	Diplopia, loss of abduction

V- Trigeminal Nerve

Function	Origin	Peripheral Distribution	Central connection	Lesion
Mastication	Motor trigeminal nucleus	Muscles of 1st pharyngeal arch	-----	Weakness of jaw, ipsilateral deviation of opened jaw
Dampens of tympanic membrane		Tensor tympani		Insignificant
Sensation	Trigeminal ganglion	Face, anterior scalp, oral, nasal cavities & orbit	Principal and spinal trigeminal nuclei	Facial hemianesthesia
Proprioceptive reflexes	Mesencephalic nucleus	Muscles of mastication & TMJ	Motor trigeminal nucleus & Mesencephalic nucleus	Insignificant

VII- Facial Nerve

Function	Origin	Peripheral Distribution	Central connection	Lesion
Facial expression	Motor Facial Nucleus	Muscles of 2 nd pharyngeal arch	-----	Facial paralysis & loss of corneal reflex
Dampens stapes		Stapedius		Hyperacusis
Secretion	Superior salivatory nucleus	Pterygopalatine ganglion to Lacrimal gland & nasal mucous membrane		Loss of Lacrimation
		Submandibular ganglion to submandibular & sublingual		Dry mouth
Taste Cutaneous sensation	Geniculate ganglion	Anterior 2/3 rd of tongue	Solitary nucleus	Loss of taste in ipsilateral ant. 2/3 rd of tongue
		Auricle & external auditory canal	Spinal nucleus of 5th CN	Anesthesia of external auditory canal

IX- Glossopharyngeal nerve

Function	Origin	Peripheral Distribution	Central connection	Lesion
Elevate pharynx swallowing	Nucleus ambiguus	Stylopharyngeus		Dysphagia
salivation	Inferior salivatory nucleus	Otic ganglion to parotid		Insignificant
Taste	Inferior (petrosal) ganglion	Posterior 1/3 rd of tongue	Solitary nucleus	Loss of taste from post. 1/3 rd
General sensation	Superior & inferior ganglia	Tonsils, auditory tube, middle ear	Spinal trigeminal nucleus	Anesthesia, loss of gag reflex (afferent limb)
Chemoreceptor & Baroreceptors reflexes (afferent limb)	Inferior ganglion	Carotid bulb & sinus	Solitary nucleus	Loss of carotid sinus reflex

X- Vagus Nerve

Function	Origin	Peripheral Distribution	Central connection	Lesion
Swallowing & Vocalization	Nucleus ambiguus	Palatal, pharyngeal, constrictors, vocal muscles		Dysphagia, weak & hoarseness of voice, sagging of palatal arch, contralateral deviation of uvula
Cardiac depressor, broncho-constrictors motility & secretion	Dorsal motor nucleus of vagus	Terminal ganglia in cardiac, pulmonary, enteric plexus		Insignificant if unilateral
Taste	Inferior (nodose) ganglion	Epiglottis & root of the tongue	Solitary	Insignificant
Sensation		Epiglottis, larynx, respiratory tree, GI tract		Hemianesthesia of pharynx & larynx, loss of cough
Chemoreceptor & baroreceptors reflex	Inferior (nodose) ganglion	Aortic bulb and sinus		Insignificant if unilateral
Sensation	Superior (jugular) ganglion	External ear and external auditory canal	Spinal trigeminal nucleus	Anesthesia of external auditory canal

XI & XII

Nerve	Function	Origin	Peripheral Distribution	Lesion
XI- Accessory	Swallowing & phonation	Nucleus ambiguus	Pharyngeal & vocal muscles	Insignificant
	Head & shoulder	Spinal accessory in C1-5 or 6	Sternomastoid & Trapezius	Loss of turning the head to opposite side and shrugging of the shoulder
XII- Hypoglossal	Tongue movement	Hypoglossal nucleus in the medulla	All muscles of tongue except palatoglossus	Unilateral atrophy & ipsilateral deviation and fasciculation