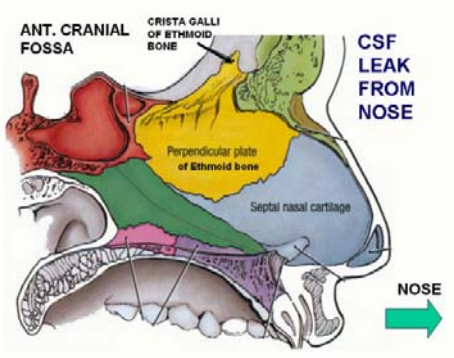
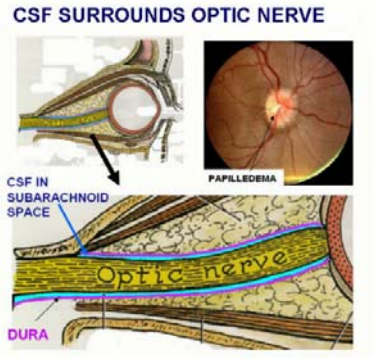
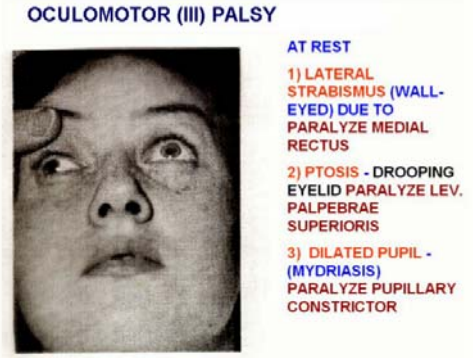
CLINICAL ANATOMY OF HEAD AND NECK

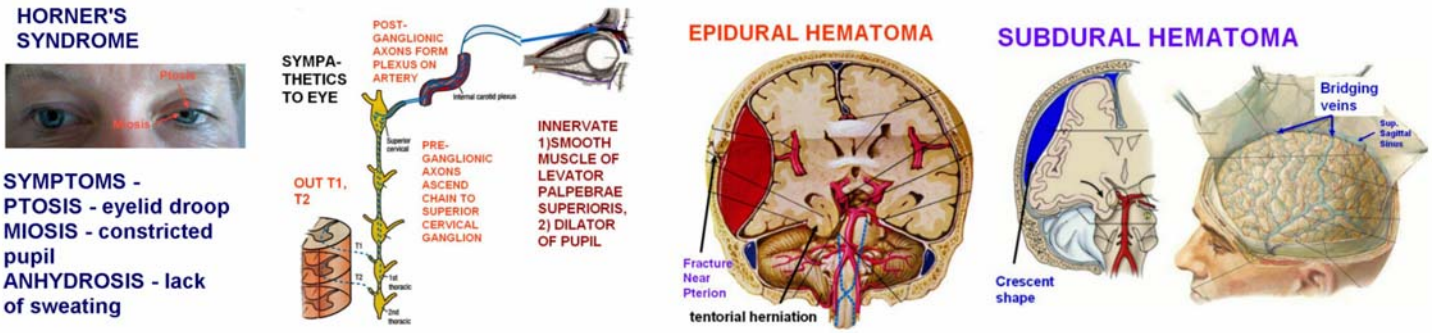
Clinical	Anatomy	Cause	Sign/Symptom
Anterior Cranial Fossa - Cranial nerve I, Nasal Cavity			
Fracture of cribriform plate of ethmoid bone	Nasal septum continuous with crista galli of ethmoid bone; Olfactory nerve passes through cribriform plate of ethmoid bone	Blow to nose; fracture produces **continuity between subarachnoid space and nasal cavity**	**Leakage of CSF from nose** ('runny nose'); **Decreased sense of smell** (hyposmia)
Middle Cranial Fossa - Cranial nerves II-VI Orbit, Eye Movements, Face			
Rapid loss of vision in one eye	Central artery of retina (branch of Ophthalmic artery from Int. Carotid) is an normally an end artery with no functional anastomoses (exception: Chorioretinal anatomoses)	**Occlusion of Central Artery of Retina**	Sudden onset blindness in one eye (one eye only, sign: artery occlusion visible through ophthalmoscope)
Slow loss of vision in one eye	Dura mater and subarachnoid continue over optic nerve; **Optic nerve function affected by CSF pressure**	**Communicating hydrocephalus** (many causes)	Decreased visual function both eyes; sign: **papilledema** in ophthalmoscope view; also other signs of increased intracranial pressure (headache, etc.)
Abducens nerve palsy	Abducens nerve innervates only Lateral Rectus muscle (action: abduction of eye)	Damage Abducens nerve VI (causes ex. increased intracranial pressure, Cavernous sinus thrombosis)	**Diplopia and Medial strabismus**
Trochlear nerve palsy	Trochlear nerve innervates only Superior Oblique muscle (action: abduct, depress and medially rotate eye)	Damage Trochlear nerve (ex. trauma)	**Inability to look down and out** (difficulty walking down stairs); **Head tilted toward side opposite lesion**
Oculomotor nerve palsy	Oculomotor nerve innervates Superior, Medial and Inferior Rectus and Inferior Oblique; part of Levator palpebrae superioris; also provides parasympathetics to pupillary constrictor, ciliary muscles	Damage Oculomotor nerve (frequently idiopathic)	**Lateral strabismus, dilated pupil, ptosis; also loss of accommodation (near vision) due to paralysis of ciliary muscles**



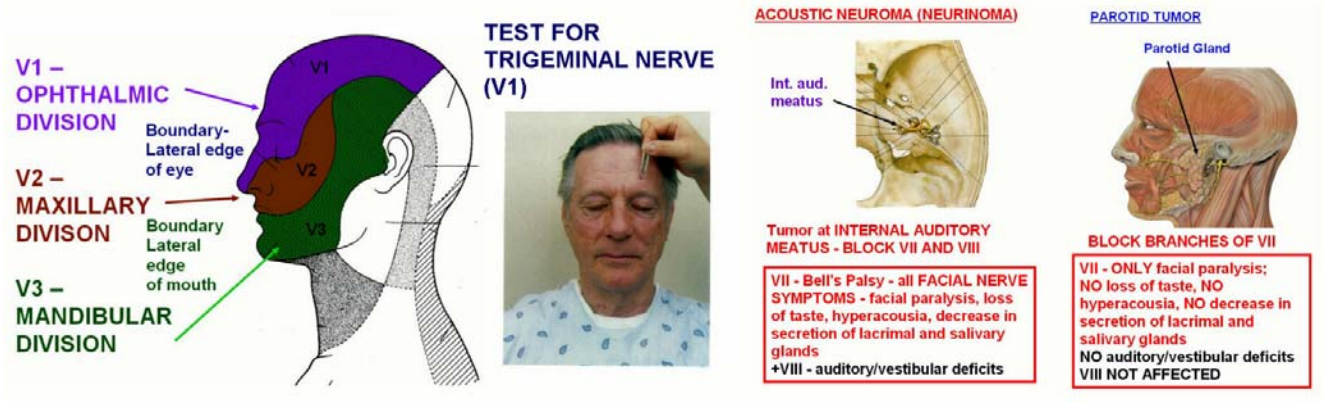




Clinical	Anatomy	Cause	Sign/Symptom
Middle Cranial Fossa - Cranial nerves II-VI Orbit, Eye Movements, Face (cont.)			
Horner's Syndrome	Sympathetics in head innervate smooth muscle part of Levator Palpebrae Superioris; Pupillary Dilator muscle; sweat glands of skin; **Pathway**: pre-ganglionic neurons out cord at T1,2; ascend in chain; post-ganglionics in Sup. Cerv. Ganglion; distributed with arteries (ex. Ophthalmic A.)	Block conduction in Sympathetics to head (tumors, etc)	**Ptosis (**drooping eyelid from smooth muscle part of Levator Palpebrae Superioris); **Constricted pupil** (miosis due to paralyze Dilator pupillae); **Anhydrosis** of forehead (denervate sweat glands)
Cavernous sinus thrombosis	Branches of cranial nerves (III, IV, V1, V2, VI) and Internal Carotid artery pass through wall of Cavernous sinus; Cavernous sinus drains ophthalmic veins which anastomose with branches of Facial Vein; veins have no valves	ex. **Infection in cav. sinus spread from infection of face** (angle of nose or upper lip particularly dangerous)	**Diplopia** (blurred vision) due to disruption of eye movements; increased venous pressure produces **engorgement in veins of retina (view in ophthalmoscope) +other symptoms**
Epidural Hematoma	**Middle Meningeal artery** (branch of Maxillary artery that passes through foramen spinosum) supplies bone of calvarium	**Blow to side of head (fracture skull in region of pterion)**	Patient conscious after accident; loses consciousness within hours; coma, death (Note: **hematoma is lens-shaped** on CT)
Subdural Hematoma	**Bridging veins** link Superficial cerebral veins on surface of brain and Superior Sagittal sinus (also other venous sinuses)	**Blow to head; in elderly can occur without distinct event**	**Slow onset** of neurological symptoms, headache (often hours to days) (Note: **hematoma is crescent-shaped** on CT)
Communicating Hydrocephalus due to decreased CSF reabsorption	CSF produce in choroid plexus; reabsorbed from subarachnoid space at arachnoid villi into venous sinuses	In elderly, **Calcification of arachnoid villi** (arachnoid granulations)	**Headache, papilledema**



Clinical	Anatomy	Cause	Sign/Symptom
Middle Cranial Fossa - Cranial nerves II-VI Orbit, Eye Movements, Face			
Numbness of regions of face	V is major sensory nerve of face and head; **Sensory neuron cell bodies** are in **Semilunar (Trigeminal) Ganglion**; V1 above lateral margin eyelids; V2 eyelids to upper lip; V3 below lateral margins of lips	Many; ex. Trigeminal Anesthesia	Numbness in specific region can be **correlated with specific division of V**
Pain in external auditory meatus following Facial paralysis	Skin of ear and external auditory meatus receive sensory innervation from V, VII, IX and X	**Bell's palsy**	Ear ache (following or accompanying Facial paralysis)
Weakness of muscles mastication	Muscles mastication innervated by V3; Lateral Pterygoid opens mouth; all other muscles Mastication close mouth	ex. **Tumor at foramen ovale**	When open mouth, **jaw deviates toward paralyzed side**
Posterior Cranial Fossa - Cranial Nerves VII-XII, face, ear, pharynx, tongue			
Facial paralysis (with effect on VIII)	CN VII and VIII exit post. cranial fossa via Internal auditory meatus; VIII ends in temporal bone; VII enters facial canal and gives off branches in temporal bone; 1) parasymp. to Lacrimal gland, mucous glands of nose, palate; 2) Nerve to Stapedius muscle; 3) Chorda tympani - taste to ant. 2/3 of tongue; parasymp. to Submandibular, Sublingual salivary glands	**Acoustic neuroma**	Loss or reduction of hearing in one ear; **Full Facial nerve palsy (Bell's palsy)** symptoms: 1) **Facial paralysis and loss of Corneal reflex** (V1 sensory, VII motor) 2) **Loss of taste to ant. 2/3 of tongue** 3) **Decreased secretion tears and saliva** 4) **Hyperacousia**
Facial paralysis (no effect on VIII)	Facial nerve exits skull via Stylomastoid foramen; only has motor branches after leaving skull	**Parotid tumor**	**Facial paralysis**; Loss of corneal reflex but **no loss of taste or decrease in tears or saliva; no hypercousia**



Clinical	Anatomy	Cause	Sign/Symptom
Posterior Cranial Fossa - Cranial Nerves VII-XII, face, ear, pharynx, tongue (cont.)			
Loss of function of IX and X	IX is major sensory nerve to pharynx (oropharynx); X is motor to all muscles of pharynx except Stylopharyngeus; all muscles of palate (except Tensor palati)	**Tumor at Jugular Foramen**	Difficulty in swallowing; **Absence of Gag Reflex**; (Gag reflex - IX sensory, X motor) **Uvula deviates away from side of lesion (Lower Motor Neuron Lesion X)**
Hoarse voice after thyroid surgery	X is motor to all muscles of larynx; also sensory to larynx; Recurrent Laryngeal nerve passes posterior to Thyroid gland with Inf. Thyroid artery; motor to all laryngeal muscles except Cricothyroid	**Damage Recurrent Laryngeal nerve during Thyroid surgery**	Hoarse voice due to **unilateral paralysis of all laryngeal muscles (except Cricothyroid)**
Torticollis	XI innervates Sternocleidomastoid and Trapezius	Torticollis can be congenital or acquired	Contracture of Sternocleidomastoid - head is rotated with face directed to opposite side (Note: **Trapezius - clinical test for XI - shrug shoulders**)
Paralysis of muscles of tongue	XII is motor to all muscles of tongue (no sensory component)	XII hypoglossal nerve palsy	Atrophy of muscles of tongue on one side; **protruded tongue deviates toward side of lesion due to Genioglossus) in Lower Motor Neuron Lesion**