CN III

Pathway:

Nucleus in ventral periaqueductal grey matter @ superior colliculus

Nerve passes through interpenducular cistern to PCA into cavernous sinus (lateral wall)

Passes into orbit, divides into superior + inferior branches

Dysfunction S&S

Eye is down and out with pupil dilation + ptosis

Patient cannot move eye up and in

Diplopia is greatest when patient moves eye towards weak side

Concomitant vs Paralytic Squint

Concomitant	Paralytic
Congenital	Affected eye shows limited movement
NO DIPLOPIA	Angle of eye deviation + diplopia greatest when looking in the direction controlled by the weak muscle
Extraoccular muscles + nerves intact	Outer image always produced by the weak eye
Full movement of eyes when tested seperately	**DIPLOPIA IS ALWAYS PRESENT**
	Head tilt posture present in opposite direction to eye - minimises diplopia

CN IV

Pathway:

Nucleus @ midbrain- level of inferior colliculus near ventral periaqueductal grey matter

Decussates in dorsal aspect of BS

Emerges laterally around cerebral peduncle

Enters into the cavernous sinus (lateral wall)

Passes through superior orbital fissure

Dysfunction S&S

Eye up and in

Pt cannot move eye down and out

Diplopia is greatest when patient moves eye towards weak side

Disorders of Gaze

Seizures	During a seizure, the eyes deviate towards affected limbs in a jerking fashion	
Themipareisis	Tonic deviation of eyes away from hemiparetic limb	Lesion in frontal lobe, ipsilateral to direction of eye
Damage to PPRF	Tonic deviation of eyes towards	Lesion in pons, contralateral to direction of eye
	Vertical gaze palsy	Midbrain/pontine lesions

Disorders of Gaze (cont)		
Perinaud syndrome	Impaired upwards eye movements, convergence, response to light + accommondation impaired	Dorsal midbrain lesion - IIIrd Ventricle tumour, pineal region tumours, hydrocephalus, wenicke's encephalopathy, encephalitis
**Internuclear ophthalmologia	Disconjugate gaze palsy, sawtooth nystagmus (back and forth)	Damage to ML bundle, MS
Webino	Bilateral IOP + exotropia + loss of convergence, conjugate gaze palsy to one side	Midbrain lesion, PPRF/abducens nucleus + adjacent ML bundle
Occular apraxia	Does not move to command but has ful range of random eye movements	Bilateral prefrontal motor cortex damage

CN VI
Pathway:
Floor of IV ventricle
Axons pass ventrally through pons, overlies basilar portion of occupital bone
Runs up petrous part of temporal bone
Enters lateral wall of cavernous sinus
Thin nerve, very vulnerable to increased ICP + superior pressure from tentorial cerebellar lesions

Dysfunction S&S
Can occur with CN III palsy
Eye position would be medial
Pt would not be able to move eye outwards
Diplopia is greatest when patient moves eye towards weak side

Eye movements	
Middle gyrus of frontal lobe	Fast rapid eye movements
Occipital cortex	Slow movement of eyes to ipsilateral side
Frontal + Occipito-mesencephalic pathway	Project to III, IV, VI nucleus
Pursuit	Slow movement that fixed image on macular area
Saccadic	Rapid - aligns new target on macular area

By **Siffi** (Siffi)
cheatography.com/siffi/

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