

Conditions which frequently cause vision and pupil light reflex abnormalities

Condition	Menace/Vision	Dazzle	Pupil light reflex using (Melan-100)		Fundus	Other ocular signs/ERG
			Red	Blue		
SARDS	No/ Sudden onset of blindness	Usually present	No	Yes – delayed but complete constriction from 10 mm to 3 mm	Usually normal, mild attenuation of optic nerve head vasculature – “pale optic nerve head syndrome”	Other ocular signs-No ERG amplitudes <i>absent</i> , No ocular pain or discomfort
Immune-mediated retinitis	No/ Complete or night blindness only – sudden onset	Usually present	Some constriction (poor) - can always be detected	Yes – delayed but complete constriction from 10 mm to 3 mm	Usually normal, mild attenuation of optic nerve head vasculature – “pale optic nerve head syndrome”	Other ocular signs-usually not, however localized neoplasia and neurological symptoms may be present in some patients; ERG amplitudes <i>normal</i> , supernormal or severely decreased, no ocular pain or discomfort
Retinal degeneration (hereditary)	Decreased (or absent especially in dim light) / Blindness is usually slowly progressive over the course of several months or even years	Usually present	Pupil response is slow, delayed and frequently pupil will initially constrict some, and start to dilated despite ongoing light stimulation – “pupil escape”	Usually delayed and complete constriction in the early stages of disease, however with advanced disease, pupil response may be incomplete and with prominent escape	Thin vasculature, peripheral “hyper-reflectivity or complete atrophy with more advanced stage of disease	Other ocular signs-No ERG near normal (early disease) or decreased with advancement of disease, no ocular pain or discomfort
Chorio-retinitis/retinitis	Menace is usually decreased or absent Vision can be severely decreased or absent- loss of vision usually develops over the course of several days or weeks	Usually present but can be absent with severe inflammation	Pupil response is slow, delayed and frequently pupil will initially constrict some, and start to dilated despite ongoing light stimulation – “pupil escape”	Usually delayed and complete constriction in the early stages of disease, however with advanced disease, pupil response may be incomplete and with prominent escape	Grey retinal appearance due to retinal edema and/or subretinal exudate; retinal vasculature frequently has increased caliber and tortuous appearance	Systemic clinical signs of disease may be present if ocular disease is a result of systemic infectious or neoplastic disease; ERG normal or decreased; some ocular pain or discomfort may be present

Retinal detachment	Menace and vision are usually absent or severely decreased (if detachment is partial)	Usually present	Pupil response is slow, delayed and frequently pupil will initially constrict some, and start to dilated despite ongoing light stimulation – “pupil escape”	Usually delayed and complete constriction in the early stages of disease, however with advanced disease, pupil response may be incomplete and with prominent escape	Detached retina	Systemic signs can be present if retinal detachment is a result of systemic infectious or neoplastic disease; ERG is decreased (partial detachment) or completely absent (complete detachment)
Glaucoma	Menace and vision are usually absent with acute attack, sudden onset of blindness (usually blindness develops in one eye, rarely in both eyes)	Frequently absent in the acute attack	Usually absent or severely diminished	Usually absent or severely diminished (red and blue responses equally affected)	Grey retinal appearance, with chronic disease decreased vascular caliber and optic nerve head cupping can be detected	Corneal edema, conjunctival hyperemia, injected episcleral blood vessels (red eye) enlarged eye globe (with more chronicity), ocular pain and discomfort may be present; ERG severely decreased or completely extinguished
Optic neuritis, meningitis, compressive optic nerve/chiasmal tumors	Menace and vision usually absent, frequently sudden onset of blindness	Usually absent	Usually absent	Usually absent	Normal fundus appearance or optic nerve head swelling	Frequently other neurological symptoms can be observed (neck pain, proprioceptive deficits); ERG normal
Brain inflammation/tumor, visual cortex damage	Menace and vision usually absent unilaterally or bilaterally, can present with sudden onset of blindness	Usually present, can be absent	Usually normal, can be decreased (bilateral miotic pupil which does not dilate well with dark adaptation can be observed)	Usually normal, can be decreased (red and blue responses are equally affected and blue response may have even more deficits than red response)	Usually normal	Neurological symptoms; ERG normal
Ophthalmoplegia interna/externa	Menace and vision normal	Normal	Absent in affected eye, normal indirect response (light illumination of the affected eye will result in the constriction of pupil in the non-affected eye)	Absent in affected eye, normal indirect response (light illumination of the affected eye will result in the constriction of pupil in the non-affected eye)	Usually normal	Usually no other symptoms/ ERG is normal

*Disclaimer - presented data present the most frequently observed pupil responses in different types of ocular diseases, however differences may exist between different patients due to individual patient variations, stage of disease or presence of multiple diseases affecting visual system simultaneously.

Note: Data and images provided courtesy of Dr. Sinisa Grozdanic