REFERRAL GUIDELINES for the PRIMARY CARE PHYSICIAN:

Visual symptoms [1,2]

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Contents

[1] ***Note:*** *These guidelines are intended to help the primary care physician decide if and when a patient needs to be referred for a variety of visual complaints. Hopefully this might reduce the need for specialty care. Needless to say it is impossible to anticipate every possible clinical circumstance and distill the problem into a one page summary per symptom that applies in all instances. There will be exceptions to every recommendation in this handout. Ultimately the decision must be based on clinical judgement and experience in dealing with eye problems. In some instances you may want to call and discuss the case by phone for advice. If there still remains some doubt about how to proceed then we suggest that you refer the patient.*

[2] ***Sources:***

Preferred Practice Patterns of the American Academy of Ophthalmology (AAOO) ;
Trobe JD The Physician's Guide to Eye Care 1993 AAOO;
Berson FG Basic Ophthalmology 1993 AAOO;
Collins JF, Donnenfeld ED, Perry HD, Wittpenn JR, (ed) Ophthalmic Desk Reference, , Raven Press 1991.

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ASYMPTOMATIC PATIENT

A. LOW RISK ADULT

AGE 20-40	**Every 3 years**

Check visual acuity. Refer if abnormal or if the patient has visual symptoms.

AGE > 40	**Every 2 years**

Complete examination every 2 years. Every 2-4 years thereafter for presbyopic corrections and check for glaucoma.

B. HIGH RISK ADULT

- ***H/O RETINAL DETACHMENT, OCULAR TRAUMA, VISION LOSS***
- ***HYPERTENSION, SICKLE CELL DISEASE***
- ***FH GLAUCOMA OR OTHER HERITABLE DISEASE***
- ***BLACK PATIENTS (RISK OF GLAUCOMA IS MUCH HIGHER)***
- ***> 65***
- ***DIABETES (SEE BELOW)***

Refer non urgently if risk factors present
Exam every 1-2 years thereafter, unless otherwise indicated

C. DIABETICS

Risk for ⇒	background diabetic retinopathy	proliferative diabetic retinopathy
diabetes 3 - 4 years	18%	0 %
diabetes >15 years	80%	25%

I. DIABETES ONSET ages 0 - 30

Recommendation: Examination 5 years after onset, yearly thereafter.

II. DIABETES ONSET age > 30

Recommendation: Examination at the time of diagnosis, yearly thereafter

III. DIABETES PRIOR TO PREGNANCY

Recommendation: prior to or early in the first trimester; every 3 m thereafter

CHRONIC or PROGRESSIVE VISION LOSS

DIFFERENTIAL DIAGNOSIS

• refractive errors • cataracts • diabetic retinopathy • age related macular degeneration (ARMD) • glaucoma	• optic neuropathies • maculopathies • corneal diseases • psychogenic

HISTORY

	Etiology.
One eye or both.	Refractive problems usually bilateral and symmetrical
Blur at near or distance.	Refractive usually affects one or other
Selective visual field loss.	Optic neuropathies, keratopathies
Blur improves by squinting or pinhole.	Refractive
Loss of color vision, color desaturation	Optic neuropathy, maculopathy
Flare or halos with headlights or street lights	Posterior subcapsular cataracts, keratopathy
Metamorphosia(wavy distortion of straight line)	Maculopathy

EXAMINATION:

	Etiology.
Visual acuity improves with pinhole or glasses	Refractive
Corneal or lens opacification	Corneal scar
Afferent pupillary defect (swinging flashlight sign)	Retinal or optic nerve dysfunction
No red reflex or difficulty viewing posterior pole	Cataract
Optic disc edema or pallor	Optic neuropathy
Pale nerve with cupping	Glaucoma
Drusen of the retina (soft yellow exudate-like deposits)	Armd
Retinal hemorrhages, exudates	Diabetes
Monocular field cuts	Optic neuropathies, maculopathies
Bitemporal hemianopsias	Chiasmal syndrome, pituitary adenoma
Homonymous hemianopsia	Hemispheric stroke or tumor

REFER NON URGENTLY

- **All patients with unexplained or undiagnosed chronic progressive visual loss** [5]

[5] *slow, progressive decline in vision not otherwise explained by refractive errors, glaucoma or other funduscopically visible process (e.g. diabetes, ARMD, maculopathy) is tumor (due to compressive optic neuropathy) until proven otherwise. All patients with unexplained vision loss must be carefully evaluated.*

SUDDEN MONOCULAR BLINDNESS

DIFFERENTIAL DIAGNOSIS:

• Retinal detachment (RD)	• Anterior ischemic optic neuropathy (AION)
• Vitreous hemorrhage	• Optic neuritis
• Arterial occlusions (CRAO)	• Choroidal neovascular membranes
• Vein occlusions	• Psychogenic
• Age related macular degeneration (ARMD)	• Sudden appreciation of long-standing blindness

HISTORY:

Floaters and photopsia	Retinal detachment, vitreous hemorrhage,
Chromatopsia	Retinal artery occlusion (green or blue), vit heme (red)
Headaches, jaw pain, polymyalgia (GCA)	Retinal artery occlusion, AION
Painful eye movements	Optic neuritis
Hypertension	Retinal artery occlusion, vein occlusion, AION
Diabetes	Vitreous hemorrhages
FH of retinal detachment	Retinal detachment
Prior H/O neurological symptoms	Optic neuritis/MS; TIA/stroke (CRAO, AION)

EXAMINATION:

Afferent pupil defect	CRAO, AION, retinal detachment, optic neuritis
Retinal edema, cherry red spot	CRAO
Macular hemorrhage	ARMD, Choroidal neovascular membrane
Drusen (soft yellow exudate like deposits)	ARMD
Numerous, scattered hemorrhages throughout	Vein occlusions
Optic disc edema	Optic neuritis (papillitis), Vein occlusions
Normal posterior pole	optic neuritis, psychogenic, peripheral RD
No red reflex, no view of fundus	vitreous hemorrhage, small pupil
Embolus	CRAO, Branch retinal artery occlusion

REFER IMMEDIATELY:	
• **Central retinal artery occlusion:**	• painless, retinal edema, cherry red spot, afferent pupilary defect; consider carotid disease, cardiogenic emboli and giant cell arteritis
• **Branch retinal artery occlusion :**	• same as CRAO but confined to one quadrant + embolus
• **Ischemic optic neuropathy:**	• painless, pale optic disc edema, APD,
(i.) Non-arteritic	• normal ESR, H/O atherosclerosis, hypertension or diabetes
(ii.) Arteritic:	• question carefully for symptoms of GCA, obtain stat ESR, any suspicion of GCA start steroids , schedule temporal artery biopsy.
• **Retinal detachment:**	• elevated retina, H/O photopsia and floaters
• **Vitreous hemorrhage:**	• without diabetes may be due to retinal tear or detachment

REFER URGENTLY (within 48 hours)	
• **Optic neuritis:**	• young patient, painful eye movements, normal or swollen optic disc, apd, symptoms of MS
• **Retinal vein occlusion:**	• numerous retinal hemorrhages in one quadrant (branch vein occlusion) or the entire posterior pole (central vein occlusion), with optic disc edema
• **ARMD**	• localized hemorrhage confined to macular region, elderly
• **Vitreous hemorrhage:**	• w/ diabetes indicative of proliferative retinopathy; w/ myopes or trauma consider retinal detachment.

TRANSIENT VISION LOSS (TVL)

TRANSIENT <u>BINOCULAR</u> VISION LOSS (TBVL)

- Optic disc edema (Transient visual obscurations)

[def : TVOs are momentary blackouts lasting seconds]

- Vertebrobasilar TIA (1-10 min)
- Migraine (15-45 min)

B.TRANSIENT <u>MONOCULAR</u> BLINDNESS (TMB)

THROMBOTIC/EMBOLIC	*NON THROMBOTIC*
• Carotid (1 - 10 min) TIA	• Optic disc edema (TVOs)
• Cardiogenic: valvular, dysrhythmia	• Retinal migraine
• Vasculitis: Temporal arteritis, Lupus, etc.	• Angle closure, epithelial keratopathies
• Hyperviscosity: P Vera, Essential thrombocythemia	• Optic disc anomaly (optic disc drusen)
• Hypercoagulability: Estrogens, Antiphospholipid Antibody syndromes, Protein C or S deficiency	• Benign, idiopathic of the young • Demyelinating (Uhthoffs) • Compressive

HISTORY:

Associated cerebral ischemic symptoms diplopia, dysarthria, vertigo, ataxia ipsilateral hemispheric symptoms	 Vertebrobasilar TIA (cardiac, Atheroemboli) Carotid, cardiogenic
Atherosclerotic risk factors	Carotid TMB, Posterior TIA
Rheumatic, prosthetic valves, atrial fib, sick sinus	Cardiogenic emboli
Constitutional symptoms	Vasculitis, hyperviscosity
Birth control pill, pregnancy, post partum	Migraine, hypercoagulability
Head or neck trauma	Carotid or vertebrobasilar dissection
Postural induced	TVOs, high grade carotid stenosis, orthostatic
Altitudinal pattern of vision loss (like a curtain)	Embolic mechanism: carotid or cardiogenic
Precipated by hot shower or exertion?	Uhthoff's, (old optic neuritis)
Palpitations, chest pain ?	Cardiogenic emboli
Headache	Migraine, giant cell arteritis
Syncope, lightheadedness	Orthostatic hypotension, valvular
Gaze induced TMB	Compressive, hematoma or tumor of the orbit
Light induced TMB	Carotid stenosis
Scintillations	Migraine, Vasculitis , AVM, Focal occipital seizures, occipital tumor (see page 7)

EXAMINATION:

Needless to say , the patient needs complete physical examination specifically looking for a murmer, carotid, ocular or cranial bruits, diminished pulses, tenderness over the temporal arteries, hypertension, postural hypotension, focal neurological signs etc. The eye examination is oftentimes normal, however , there are some helpful findings which when present may support a specific diagnosis. The eye exam might be notable for an afferent pupillary defect (optic neuritis, Uhthoffs), retinal emboli (carotid, cardiogenic), retinal vasculitis, optic disc edema (transient visual obscurations), narrow angles, ocular hypertension (angle closure glaucoma).

REFER URGENTLY[6] (within 24 hours)

- **Amaurosis fugax with elevated ESR or symptoms of GCA , start prednisone then refer**
- **Frequent episodes of TVL in rapid succession,**
- **TVL followed by persistent visual field loss** (see sudden monocular blindness p 4)
- **Transient visual obscurations with optic disc edema**

REFER NON URGENTLY

- **Rule out thrombotic-embolic causes , then refer if the etiology remains uncertain.**

[6] *Note: Transient vision loss is a complaint that does not lend itself to simple universal recommendations. So much depends on the clinical setting. In many instances the patient requires a medical or neurological workup rather than an eye exam. Ultimately it is a judgement call. In general <u>patients can be referred of an eye exam non urgently (within 1-3 weeks)</u>. While TVL can be the harbinger of sudden and permanent blindness or stroke, this outcome is fortunately rare.*

RED EYE

DIFFERENTIAL

• Conjunctivitis	• Angle closure glaucoma	• Orbital pseudotumor
• Blepharitis	• Uveitis	• Thyroid orbitopathy
• Stye	• Keratitis (herpes, corneal ulcers)	• Orbital cellulitis
• Subconj heme	• Neovascular glaucoma	• Scleritis , episcleritis

HISTORY

Visual acuity	Vision normal in conjunctivitis
Pain	Angle closure, keratitis , scleritis, episcleritis are painful
Photophobia	keratitis, uveitis
Halos	Sign of corneal edema in angle closure
Itchy	Allergic conjunctivitis
Discharge ? Purulent Serous	Bacterial conjunctivities Viral conjunctivitis
Eyelids matted and stick together in AM	Bacterial conjunctivitis
Floaters	Uveitis

EXAM:

Check the vision	Vision abnormal in angle closure, uveitis, keratitis,
Pupil	Fixed/mid dilated (angle closure) , small/fixed or irregular (uveitis)
Tension	Elevated in angle closure, may be low in uveitis
Fluroescein staining	Keratitis
Proptosis	Thyroid, orbitopathy, orbital pseudotumor, scleritis
Ophthalmoloplegia	Thyroid, orbitopathy, orbital pseudotumor, scleritis
Localized injection	Episcleritis, scleritis
Chemosis	Thyroid, orbitopathy, orbital pseudotumor, scleritis allergic conjunctivitis
Eyelid	Marginal erythema (blepharitis), upper lid retraction (thyroid), ptosis and swelling(pseudotumor, scleritis, orbital cellulitis)
Corneal haze (edema)	Angle closure, neovascular glaucoma, keratitis, (uveitis)
White corneal infiltrate	Bacterial corneal ulcer

REFER IMMEDIATELY:

- **Angle Closure Glaucoma: painful red eye, hazy cornea, mid dilated fixed pupil, elevated pressure**
- **Corneal Ulcer: opacified, white corneal infiltrate, red eye, purulent discharge**

REFER URGENTLY (within 24 - 48 hours)

• **Pain**	• **Photophobia**	• **Blurred vision**
• **Proptosis**	• **Ophthalmoplegia**	• **Ciliary flush**
• **Irregular corneal refex**	• **Epithelial defect**	• **Pupil fixed or sluggish**
• **Worsenig after 3 d treatment**	• **Compromised host**	

TREAT:

Blephartis: gritty, burning, matting, scaling or flaking of lid, mild conjunctival injection . Apply Bacitracin ophthalmic to eyelid HS, Commercial lid hygiene solution (e.g. Eye-scrub qAM) Refer non urgently if symptoms persist.

Conjunctivitis:

Bacterial: topical antimicrobial medications (e.g. Polytrim QID), refer if redness fails to resolve after 3 days

Viral : frequent handwashing, non communal activity, no antibiotics needed. Refer urgently if vision blurs, photobic or other signs of keratitis develop.

Stye: warm compresses, antibiotic eyedrops, Bacitracin ophthalmic ointment at bedtime. Refer non urgently if it fails to resolve after 1 week. for incision and drainage

Allergic conjunctivitis: topical decongestants (e.g. Naphcon A QID) for symptomatic relief of itch.

Subconjunctival hemorrhage: spontaneous, benign, no treatment required.

FLASHES, PHOTOPSIA AND SCINTILLATIONS

DIFFERENTIAL

RETINAL PHOTOPSIA *momentary bright flashes of light lasting seconds at most*	**CORTICAL SCINTILLATIONS** *scintillating zig zag lines or colored lights lasting 2-45 minutes +/- scotomas*
• Retinal traction	• Migraine (15-45 min)
• Retinal tear	• Vertebrobasilar TIA (2-10 min)
• Posterior vitreous detachment (PVD)	• Seizure
• Retinal detachment	• Arteriovenous malformation

HISTORY and EXAM

Duration is single most helpful clue	Seconds : retinal 2-10 min: TIA 15-45 min: migraine
Scintillations march across the visual field ("spectral march")	Migraine (seizures are stereotyped and stationary)
Induced by eye or head movement	Retinal photopsia
Floaters	Retinal hole, retinal detachment, PVD
Headache (typically throbbing, unilateral etc)	Migraine
Vertigo, diplopia, ataxia, speech etc	TIA
H/O myopia, FH retinal detachment or trauma	Retinal tear, retinal detachment
Audible cranial bruits, h/o seizures	AVM
Associated homonymous hemianopsia	Migraine, TIA, AVM

REFER EMERGENTLY

- **Observed retinal detachment, absent red reflex or vitreous hemorrhage,**
- **Photopsia associated with decreased vision, visual field cut or floaters.**
- **Cortical scintillations with persistent neurological deficits: hemianopsias, hemiparesis (obtain MRI) ; refer to neurology.**

REFER URGENTLY (within 48 hours)

- **New onset photopsia or marked worsening of pre-existant chronic photopsia**

REFER NON URGENTLY

- **Chronic or recurrent flashes**
- **Vertebrobasilar TIA: start antiplatelets , neurovascular workup, R/O cardiogenic or vasculitis**

TREAT

- **Migraine**

FLOATERS

Grey spots, cobwebs, black spots that appear to drift or lag with eye movement

DIFFERENTIAL

• Physiologic entopic phenomena	• Retinal detachment
• Posterior vitreous detachment (PVD)	• Vitreous hemorrhage
• Retinal tear, hole	• Vitreous inflammation (uveitis)

HISTORY

Sudden onset in an elderly or a high myope	PVD, vitreous degeneration
Showers of floaters, associated with flashes and/or decreased vision	Retinal tear, retinal detachment
New onset floaters in a diabetic	Vitreous hemorrhage
Red eye, pain, photophobia, blurred vision	Vitreous inflammation

REFER URGENTLY

- **New onset floaters associated with vision loss (see SUDDEN MONOCULAR BLINDNESS)**
- **New onset floaters in diabetics, vitreous hemorrhage**
- **Red eye and floaters**

REFER NON URGENTLY

- **Chronic floaters**

TEARING (EPIPHORA)

DIFFERENTIAL

OVERPRODUCTION	*POOR DRAINAGE*	*REFLEX TEARING*
• **Blepharitis** • **Conjunctivits** • **Keratitis** • **Uveitis** • **Orbital inflammatory disease** • **Thyroid orbitopathy** • **Orbital cellulitis etc.** ***See red eye p. 6***	• **Eyelid deformity** **(poor apposition of the lower eyelid)** **- cicatricial lid retraction** **- facial nerve palsy** **- ectropion** **- others** • **Nasolacrimal outflow obstruction:** **-congenital** **-dacryocystitis** **-trauma** **-nasolacrimal tumor** **-sinus tumor**	• **Dry eyes** **- idiopathic** **-Keratitis Sicca** **-Corneal foreign body** **-Trichiasis (eyelash)**

HISTORY and EXAM

Red eye, pain, photophobia	Inflammatory (see RED EYE)
Tenderness , swelling, erythema over lacrimal sac Purulent reflux from canaliculus induced by pressure on the sac	Dacryocystitis
History of Bell's palsy, facial burn, trauma	Appositional lid deformity
Unilateral, since birth	Congenital nasolacrimal duct obstruction
Dry mouth, rheumatic disease	Keratitis sicca

REFER URGENTLY

- **See RED EYE if this appears to be inflammatory in origin.**
- **Dacryocystitis**
- **Embedded foreign bodies not removable with cotton swab**

REFER NON URGENTLY

- **Refer newly acquired cases, if due to eyelid deformity**
- **Dry eyes that fail to respond to topical lubricants**
- **Progressive or intolerable epiphora**

TREAT:

- **Foreign body , if easily removed**
- **Symptomatic dry eye with topical lubricants**
- **See guidelines for RED EYE**

DIPLOPIA

DIFFERENTIAL

MONOCULAR DIPLOPIA: *persistent diplopia with monocular occlusion, localizes to one eye due to an optical aberration*	**BINOCULAR DIPLOPIA** *diplopia with both eyes viewing, resolves with monocular occlusion of either eye ; due to an ocular motor misalignment*
• Cataracts • Refractive error • Vitreous opacity • Corneal scar • Retinal elevation (rare) • Cerebral polyopia (rare) • Psychogenic	• Ocular myopathy: thyroid, myasthenia • Orbital tumor or fracture • Cranial neuropathy: iii, iv, vi • Central : nuclear, internuclear or supranuclear e.g. Internuclear ophthalmoplegia, skew deviation due to midbrain, pontine, cerebellar or medullary dysfunction. Vergence disorders: e.g. convergence insufficiency • Decompensated strabismus • Convergence spasms (psychogenic)

HISTORY:

Monocular "ghost" image	Refractive or cataract
Vertical or horizontal separation	Distinguishes between horizontal vs vertical recti
Worsens at distance or near	Abduction weakness worse at distance, adduction weakness worse at near. Convergence insufficiency symptomatic when reading.
Worsens with left or right gaze	Strabismus constant in all directions of gaze, ophthalmoplegias worsen when looking towards the field of action of a paretic muscle.
Worsens with head tilt left or right	Superior oblique palsies typically worsen on ipsilateral head tilt.
Ptosis	III rd nerve palsies, myasthenia, orbital tumors
Headache	Ischemic cranial neuropathies, aneurysmal iii n palsies, orbital pseudotumor, concurrent trigeminal neuropathy (cavernous sinus syndrome).
Red eye or proptosis	Orbital pseudotumor, thyroid orbitopathy, carotid cavernous fistula, orbital tumors
Blown pupil	Pupil involving iii n palsies often due to aneurysms but less commonly can also be ischemic
H/O amblyopia, eye muscle surgery	Strabismus
History of trauma	Cranial neuropathy, orbital fractures, convergence insufficiency
Other neurological complaints	Cranial neuropathy, central
Diurnal variation: worse in AM worse in PM	thyroid orbitopathy ocular myasthenia, decompensated strabismus

Examination:

In addition to a careful evaluation of eye movements in all the cardinal positions of gaze, the patient must be careful examined for signs of ptosis, anisocoria, pupil reactivity, lid swelling, proptosis, redness, corneal sensation, facial sensation and bruits.

REFER URGENTLY [7]

- **Acquired and persistent binocular diplopia**
- **Acquired, painful, pupil involving III n palsy (without a history of diabetes) is aneurysmal or neoplastic until proven otherwise. Obtain MRI/MRA urgently.**

REFER NON URGENTLY

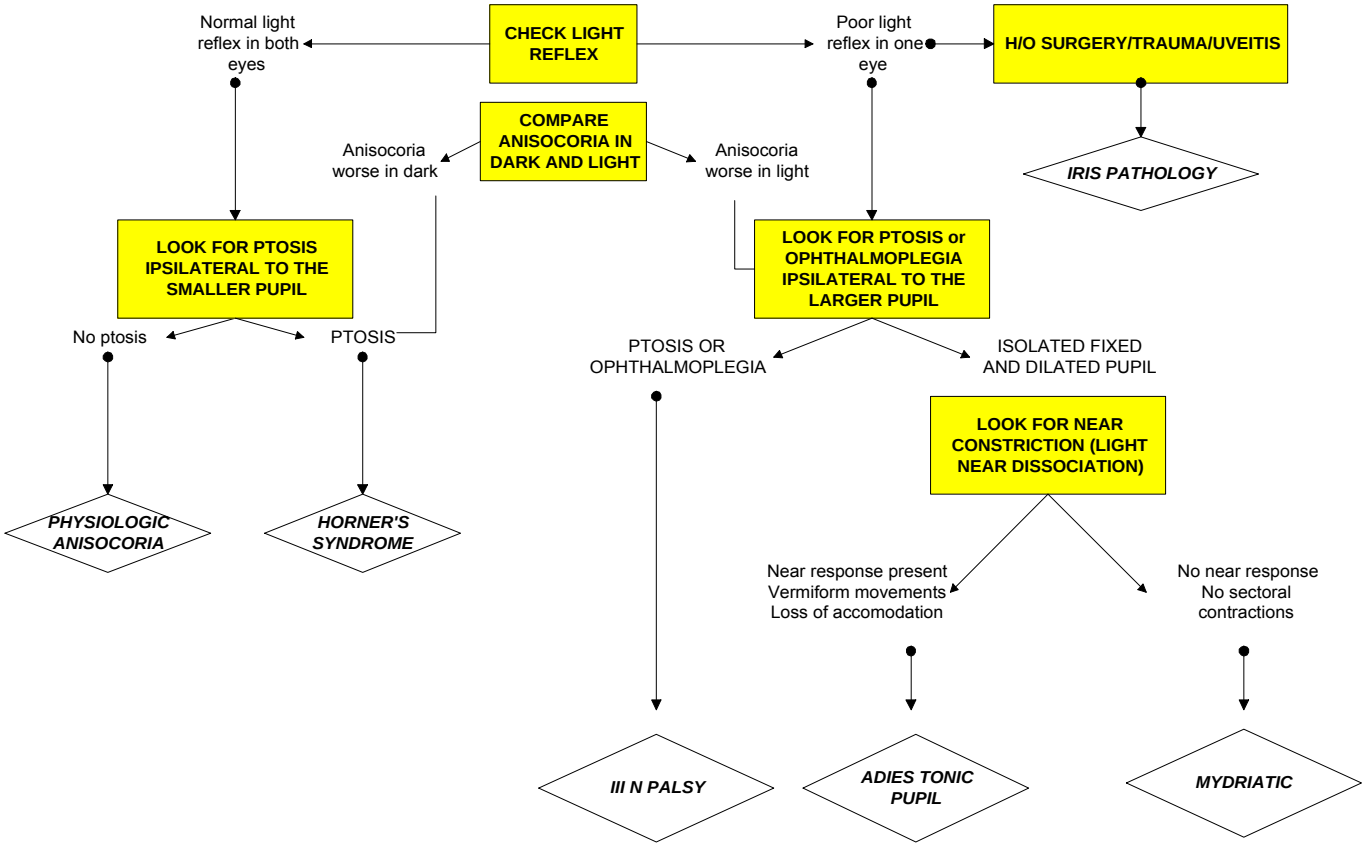
- **Monocular diplopia,**
- **intermittent diplopia when reading**
- **transient diplopia,**
- **chronic binocular diplopia.**

[7] *Note: Imaging studies in recently acquired cases of diplopia are not always necessary e.g. IV n palsies, thyroid orbitopathy, many disorders of vergence, decompensated phoria, ocular myasthenia, pupil sparing diabetic III nerve palsies.*

ANISOCORIA

DIFFERENTIAL

SMALL PUPIL	DILATED , FIXED PUPIL
• Horner's syndrome • Iris synechia: old uveitis, previous surgery • Chronic Adies tonic pupil • Physiologic anisocoria	• Iris pathology: sphincter tear, iris atrophy • Mydriatics: atropine, scopalamine, mydriacil, cyclogyl • Adies tonic pupil • III rd nerve palsy • Physiologic anisocoria



REFER URGENTLY

Anisocoria with ptosis or ophthalmoplegia

REFER NON URGENTLY

Isolated anisocoria

OCULAR TRAUMA

TREAT ON SITE AND REFER IMMEDIATELY

- **Acid or alkalai burn**

REFER IMMEDIATELY

- **severe pain**
- **deformed globe**
- **eyelid lacerations which**
  - **-involve the lid margin**
  - **-canaliculus**
  - **-deep, prolapsed fat**
- **new onset subnormal acuity**
- **corneal or scleral laceration**
- **hyphema**
- **? intraocular foreign body**
- **loss of red reflex**
- **irregular pupil**
- **corneal clouding**
- **severe lid swelling**
- **severe conjuctival chemosis**
- **proptosis**

REFER URGENTLY (within 48 hours)

- **Pain**
- **foreign body sensation**
- **suspected orbital wall fracture**
- **photophobia**
- **large corneal abrasion**
- **moderate eyelid swelling or chemosis with normal vision**
- **diplopia**
- **suspected laceration of globe**

TREAT

- **minor corneal abrasions**
- **removable foreign bodies (note if there is a history of risk of high velocity foreign body patient needs dilated exam to check for occult penetration of the eye)**
- **<u>superficial</u> brow and lid lacerations that do not involve the lid margin or canaliculus**
- **periorbital soft tissue injury without change in vision or evidence of ocular contusion**

SYSTEMIC DRUGS : OCULAR TOXICITY

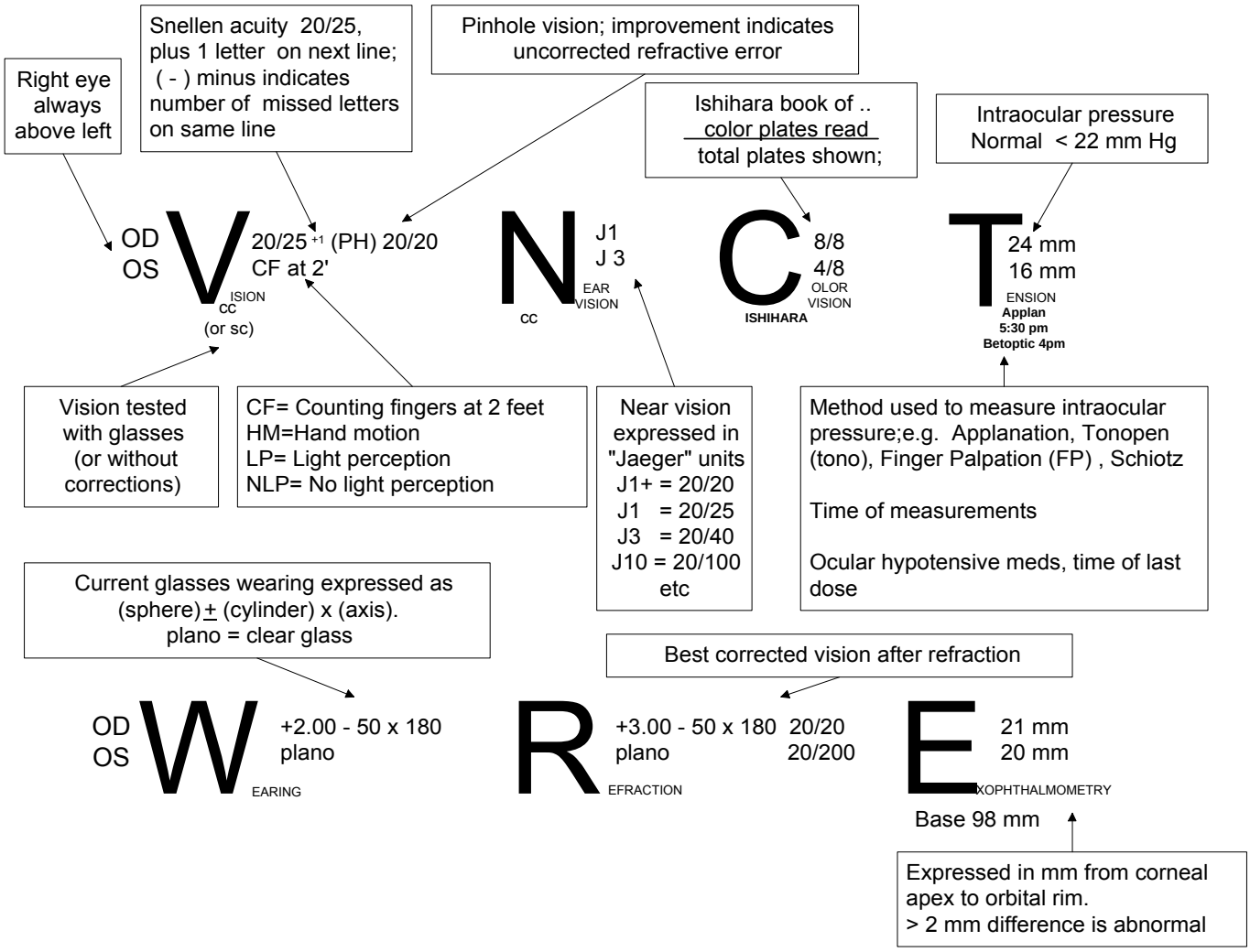
(RECOMMENDATIONS FOR MONITORING)

DRUG	Complications	Recommendations
AMIODARONE	• All corneal deposits ("whorls") • Reversible when stopped • Symptoms of halos, blur are unusual • Optic neuropathy (rare)	• Refer patients with subnormal vision or symptoms. Discontinue if symptomatic. • The mere presence of deposits is not in and of itself a reason to discontinue
ANTICHOLINERGIC	• Loss of accomodation • Angle closure glaucoma	• Refer for refraction if symptomatic • Refer if angle is narrow or for painful red eye • Open angle glaucoma is not a contraindication
CHLOROQUINES	• >300 g total cumulative dose (3 yrs) • "bulls eye" maculopathy • Corneal deposits	• Baseline exam • Follow up q 6 months
CORTICOSTEROIDS	• Cataracts, • Glaucoma • Pseudotumor cerebri	• Refer for slow, decline in vision or transient visual obscurations. • Eye exam q6 months
DIGITALIS	• Xanthopsia (yellow vision) • Flickering or snowy distortion • Rarely optic neuropathy	• Check blood level and adjust accordingly. • Refer if blood level is normal with symptoms or subnormal vision.
DILANTIN	• Vestibulocerebellar signs and symptoms • Diplopia, oscillopsia, blurring • Gaze evoked nystagmus	• Check dilantin level and adjust accordingly if in the toxic range.
ETHAMBUTOL	• Dose related optic neuropathy as early as 1 m after starting the drug. Reversible early on. • At 15 mg/kg incidence < 1% • At 20 mg/kg incidence 5%	• Refer for baseline exam • Follow-up every 6 months. • Refer urgently for any visual decline.
THIORIDAZINE	• Pigmentary retinopathy at doses of >1000mg /d	• Maximum dose recommendation 800mg/d • Refer for symptoms

OPHTHALMIC MEDICATIONS
SYSTEMIC AND OCULAR SIDE EFFECTS

CLASS	DRUG	OCULAR	SYSTEMIC
ANESTHETICS	• Proparicaine • Tetracaine	• Epithelial keratopathy • should be restricted for exam only, never to be used as an analgesic	• none
ANTIMICROBIALS	• Neomycin (many brands) • Gentamicin (many brands) • Tobramycin (Tobrex)	• Eyelid or facial dermatitis • Keratitis with long term use	• none
	• Erythromicin (Ilotycin)	• none	• none
	• Ciprofloxicin (Ciloxan) • Norfloxacin (Chibroxin)	• corneal deposits	• none
	• Polymixin	• none	• none
	• Trimethoprim-polymixin (Poly trim)	• none	• none
	• Sulfacetamide	• eyelid dermatitis	• Stevens Johnson
ANTIVIRALS	• Trifluridine (Viroptic) • Vidarabine (Vira A) • Idoxiuridine (Herplex, Stoxil, Dendrid) • Acyclovir (Zovirax)	• epithelial keratopathy • conjunctivitis • lacrimal punctal stenosis	• none
ARTIFICIAL TEARS	• many brands	• none	• none
GLAUCOMA	• Epinephrine (Epifren, Glaucon) • Dipivefrin (Propine)	• conjunctival hyperemia • black conjunctival deposits	• tachycardia • PVCs • hypertension • tremor • anxiety
	• Timilol (timoptic) • Betaxalol (betoptic) • Levobunolol (Betagan) • Carteolol (Ocupress) • Metipranolol (Optipranolol)	• no significant complications	• Bradycardia • Bronchospasm • hypotension, syncope • reduced libido • lethargy and depression
	• Acetozolamide (Diamox)	• induced myopia	• Stevens Johnson • Renal stones • Paresthesias • Nausea • Dysgeusia • Anorexia • lassitude • Loss of libido , Impotence • Acidosis • Aplastic anemia
CHOLINERGICS	• Pilocarpine	• constriction • conjunctival injection • induced myopia	• Headache or brow ache • cramping, vomiting • diarrhea • diaphoresis • bronchospasm • unstable BP
STEROIDS	• Prednisilone (many brands) • Dexamethasone (many brands) • Medrysone (HMS) • Fluoromethalone (FML)	• ocular perforations in patients with necrotizing inflammation • glaucoma • cataract • exacerbate viral and fungal keratitis	• none

HIEROGLYPHICS OF THE EYE EXAM



LIDS: **LF = lid fissure**

PUPILS: **APD = afferent pupillary defect**

SLE: **= (SLIT LAMP EXAMINATION)**

CONJ: (= CONJUNCTIVA)
CORNEA: (= K)
A/C: (= ANTERIOR CHAMBER)
IRIS: **PI = peripheral iridectomy**
LENS: **PSC=posterior subcapsular cataract, NS=nuclear sclerotic cataract**
GRADING CATARACT DENSITY : 1+ (mild) to 4+(severe)
PCIOL = POSTERIOR CHAMBER INTRAOCULAR LENS,
ACIOL = ANTERIOR CHAMBER IOL

MOTILITY:

- **OCULAR MISALIGNMENT EXPRESSED IN PRISM DIOPTERS (PD)**
  1 PD = light displaced by 1cm at 1 m
- **PHORIA is a latent misalignment**
- **TROPIA is a manifest misalignment.**

- **NOTATION USED TO QUANTITATE MISALIGNMENT:**

1. ORTHO = both eyes aligned
EX = 0

2. AT DISTANCE -
a. ESODEVIATIONS (eyes crossed)
E = esophoria
ET = esotropia
b. EXODEVIATIONS
X = exophoria
XT= exotropia
c. HYPERDEVIATONS (one eye higher relative to the other; by convention lateralize to the upper eye even if the lower eye is abnormal)
RH = right hyperphoria
RHT = right hypertropia
LH = left hyperphoria
LHT = left hypertropia

3. AT NEAR
same as above with PRIME e.g. ET', X', LHT'

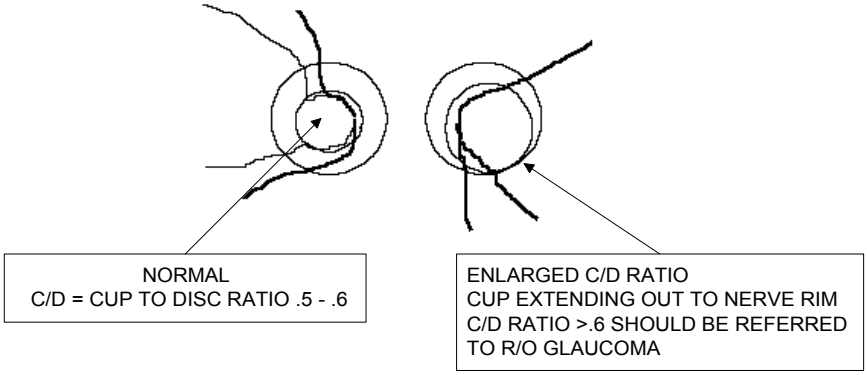
4. Example: Grid shows misalginement in patient's cardinal positions of gaze i.e. 12 prism diopters of left hypertropia in right gaze, 2 prism diopters of left hyperphoria in left gaze, etc. This particular example demonstrates an incomitant vertical misalignment that worsens when looking down and to the right which is typical of a IV nerve palsy. This grid can also be used to document the direction of the fast phase of nystagmus in various positions of gaze by using arrows of varying size to also document its amplitude or intensity.

RIGHT LEFT

	2 LHT 2 XT		□□□UP
12 LHT	4 LHT	2 LH	1^0
16 LHT	5 LHT 4 ET		□□□DOWN

FUNDUS EXAMINATION: (dilated; undilated)

Diagrams are often used to document fundus findings. Examples of common abbreviations and notations used to document a variety of abnormalities are shown below.



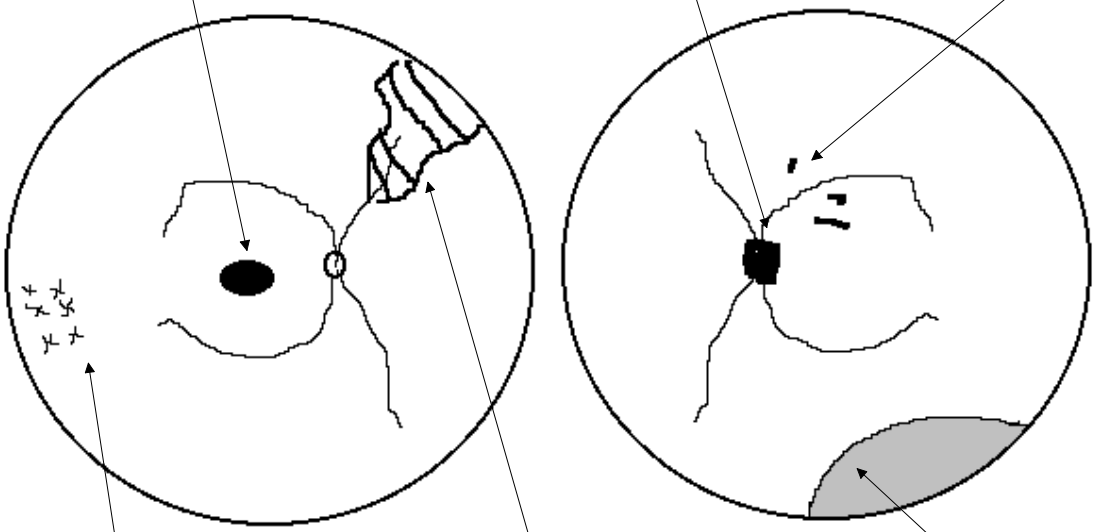
NORMAL
C/D = CUP TO DISC RATIO .5 - .6

ENLARGED C/D RATIO
CUP EXTENDING OUT TO NERVE RIM
C/D RATIO >.6 SHOULD BE REFERRED TO R/O GLAUCOMA

SRF = SUBRETINAL FLUID
PED = PIGMENT EPITHELIAL DETACHMENT
SRNV = SUBRETINAL NEOVASCULAR MEMBRANE
ARMD = AGE RELATED MACULAR DEGENERATION
TRD = TRACTION RETINAL DETACHMENT
CSME = CLINICALLY SIGNIFICANT MACULAR EDEMA

ODE = OPTIC DISC EDEMA
OA = OPTIC ATROPHY
NVD = NEOVASCULARIZATION DISC

RETINAL HEMORRHAGES
CWS = COTTON WOOL SPOTS
HE = HARD EXUDATES
NVE = NEOVASCULARIZATION ELSEWHERE
BDR = BACKGROUND DIABETIC RETINOPATHY
PDR = PROLIFERATIVE DIABETIC RETINOPATHY



OD

OS

LASER SCARS
LATTICE DEGENERATION
RETINAL HOLE

NECROTIZING RETINITIS
BRAO = BRANCH ARTERY OCCLUSION
BRVO = BRANCH VEIN OCCLUSION

RD = RETINAL DETACHMENT
WWP = WHITE WITHOUT PRESSURE

RETINAL SCHISIS
CILIOCHOROIDAL EFFUSION
MELANOMA

COMMON ABBREVIATIONS :

AION	*Anterior ischemic optic neuropathy*
ALT	*Argon laser trabeculoplasty*
AMD or ARMD	*Age related macular degeneration*
APD	*Afferent pupillary defect*
BDR	*Background diabetic retinopathy*
BRAO	*Branch retinal artery occlusion*
BRVO	*Branch retinal vein occlusion*
CRAO	*Central retinal artery occlusion*
CRVO	*Central retinal vein occlusion*
CSME	*Clinically significant macular edema*
CWS	*Cotton wool spot*
FRP	*Focal retinal photocoagulation*
HE	*Hard exudate*
LTG	*Low tension glaucoma*
NVD	*Neovascularization at disc*
NVE	*Neovascularization elsewhere*
PACG	*Primary angle closure glaucoma*
PDR	*Proliferative diabetic retinopathy*
POAG	*Primary open angle glaucoma*
PPDR	*Preproliferative diabetic retinopathy*
PRH	*Preretinal hemorrhage*
PRP	*Panretinal photocoagulation*
PVD	*Posterior vitreous detachment*
RD	*Retinal detachment*
RPE	*Retinal pigment epithelium*
SRF	*Subretinal fluid*
SRNV	*Subretinal neovascularization*
TRD	*Traction retinal detachment*
VH	*Vitreous hemorrhage*