REFERRAL GUIDELINES
for the
PRIMARY CARE PHYSICIAN:
Visual symptoms

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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 judgment 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.

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;

Department of Ophthalmology State University of New York at Stony Brook School of Medicine and Ophthalmology Section, Surgical Service, Northport Veterans Administration Hospital.
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

<table>
<thead>
<tr>
<th>Risk for</th>
<th>background diabetic retinopathy</th>
<th>proliferative diabetic retinopathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>diabetes 3 - 4 years</td>
<td>18%</td>
<td>0 %</td>
</tr>
<tr>
<td>diabetes &gt;15 years</td>
<td>80%</td>
<td>25%</td>
</tr>
</tbody>
</table>

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

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:

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

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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:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinal detachment (RD)</td>
<td></td>
</tr>
<tr>
<td>Vitreous hemorrhage</td>
<td></td>
</tr>
<tr>
<td>Arterial occlusions (CRAO)</td>
<td></td>
</tr>
<tr>
<td>Vein occlusions</td>
<td></td>
</tr>
<tr>
<td>Age related macular degeneration (ARMD)</td>
<td></td>
</tr>
<tr>
<td>Anterior ischemic optic neuropathy (AION)</td>
<td></td>
</tr>
<tr>
<td>Optic neuritis</td>
<td></td>
</tr>
<tr>
<td>Choroidal neovascular membranes</td>
<td></td>
</tr>
<tr>
<td>Psychogenic</td>
<td></td>
</tr>
<tr>
<td>Sudden appreciation of long-standing blindness</td>
<td></td>
</tr>
</tbody>
</table>

## HISTORY:

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

## EXAMINATION:

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

## REFER IMMEDIATELY:

- **Central retinal artery occlusion:** painless, retinal edema, cherry red spot, afferent pupillary 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:**
  - (i.) Non-arteritic
  - (ii.) Arteritic:
    - Painless, pale optic disc edema, APD,
    - Normal ESR, H/O atherosclerosis, hypertension or diabetes
    - 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**
- **Vitreous hemorrhage:** w/ diabetes indicative of proliferative retinopathy; w/ myopes or trauma consider retinal detachment.
TRANSIENT VISION LOSS (TVL)

### TRANSIENT BINOCULAR 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 MONOCULAR BLINDNESS (TMB)

#### THROMBOTIC/EMBOLIC
- Carotid (1-10 min) TIA
- Cardiogenic: valvular, dysrhythmia
- Vasculitis: Temporal arteritis, Lupus, etc.
- Hyperviscosity: P Vera, Essential thrombocytethemia
- Hypercoagulability: Estrogens, Antiphospholipid Antibody syndromes, Protein C or S deficiency

#### NON THROMBOTIC
- Optic disc edema (TVOs)
- Retinal migraine
- Angle closure, epithelial keratopathies
- Optic disc anomaly (optic disc drusen)
- Benign, idiopathic of the young
- Demyelinating (Uhthoffs)
- Compressive

### HISTORY:
- Associated cerebral ischemic symptoms
  - diplopia, dysarthria, vertigo, ataxia
  - ipsilateral hemispheric symptoms
- Atherosclerotic risk factors
- Rheumatic, prosthetic valves, atrial fib, sick sinus
- Constitutional symptoms
- Birth control pill, pregnancy, post partum
- Head or neck trauma
- Postural induced
- Altitudinal pattern of vision loss (like a curtain)
- Precipitated by hot shower or exertion?
- Palpitations, chest pain?
- Headache
- Syncope, lightheadedness
- Gaze induced TMB
- Light induced TMB
- Scintillations

#### 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.

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\(^6\) 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, patients can be referred for an eye exam non urgently (within 1-3 weeks). While TVL can be the harbinger of sudden and permanent blindness or stroke, this outcome is fortunately rare.
RED EYE

DIFFERENTIAL

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

HISTORY

Visual acuity
Vision normal in conjunctivitis

Pain
Angle closure, keratitis , uveitis, episcleritis are painful

Photophobia
keratitis, uveitis

Halos
Sign of corneal edema in angle closure

Itchy
Allergic conjunctivitis

Discharge ?
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/fixd or irregular (uveitis)

Tension
Elevated in angle closure, may be low in uveitis

Fluorescein staining
Keratitis

Proptosis
Thyroid, orbitopathy, orbital pseudotumor, scleritis

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

TREAT:

Blepharitis: 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

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

## HISTORY and EXAM

**Duration is single most helpful clue**
- Seconds: retinal
- 2-10 min: TIA
- 15-45 min: migraine

<table>
<thead>
<tr>
<th>Scintillations march across the visual field (“spectral march”)</th>
<th>Migraine (seizures are stereotyped and stationary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induced by eye or head movement</td>
<td>Retinal photopsia</td>
</tr>
<tr>
<td>Floaters</td>
<td>Retinal hole, retinal detachment, PVD</td>
</tr>
<tr>
<td>Headache (typically throbbing, unilateral etc)</td>
<td>Migraine</td>
</tr>
<tr>
<td>Vertigo, diplopia, ataxia, speech etc</td>
<td>TIA</td>
</tr>
<tr>
<td>H/O myopia, FH retinal detachment or trauma</td>
<td>Retinal tear, retinal detachment</td>
</tr>
<tr>
<td>Audible cranial bruits, h/o seizures</td>
<td>AVM</td>
</tr>
<tr>
<td>Associated homonymous hemianopsia</td>
<td>Migraine, TIA, AVM</td>
</tr>
</tbody>
</table>

## 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**

<table>
<thead>
<tr>
<th>Physiologic entopic phenomena</th>
<th>Retinal detachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posterior vitreous detachment (PVD)</td>
<td>Vitreous hemorrhage</td>
</tr>
<tr>
<td>Retinal tear, hole</td>
<td>Vitreous inflammation (uveitis)</td>
</tr>
</tbody>
</table>

**HISTORY**

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

**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

<table>
<thead>
<tr>
<th>OVERPRODUCTION</th>
<th>POOR DRAINAGE</th>
<th>REFLEX TEARING</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Blepharitis</td>
<td>- Eyelid deformity (poor apposition of the lower eyelid)</td>
<td>- Dry eyes</td>
</tr>
<tr>
<td>- Conjunctivitis</td>
<td>- facial nerve palsy</td>
<td>- idiopathic</td>
</tr>
<tr>
<td>- Keratitis</td>
<td>- ectropion</td>
<td>- Keratitis Sicca</td>
</tr>
<tr>
<td>- Uveitis</td>
<td>- others</td>
<td>- Corneal foreign body</td>
</tr>
<tr>
<td>- Orbital inflammatory disease</td>
<td></td>
<td>- Trichiasis (eyelash)</td>
</tr>
<tr>
<td>- Thyroid orbitopathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Orbital cellulitis etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*See red eye p. 6*

### HISTORY and EXAM

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

### 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 Diagnosis

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

## History

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

## 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

- 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 |

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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

<table>
<thead>
<tr>
<th>SMALL PUPIL</th>
<th>DILATED, FIXED PUPIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Horner’s syndrome</td>
<td>• Iris pathology: sphincter tear, iris atrophy</td>
</tr>
<tr>
<td>• Iris synechiae:</td>
<td>• Mydriatics:</td>
</tr>
<tr>
<td>old uveitis, previous surgery</td>
<td>atropine, scopalamine, mydriacil, cyclogyl</td>
</tr>
<tr>
<td>• Chronic Adies tonic pupil</td>
<td>• Adies tonic pupil</td>
</tr>
<tr>
<td>• Physiologic anisocoria</td>
<td>• III rd nerve palsy</td>
</tr>
<tr>
<td></td>
<td>• Physiologic anisocoria</td>
</tr>
</tbody>
</table>

- **ANISOCORIA**
- **DIFFERENTIAL**
- **SMALL PUPIL**
  - Horner’s syndrome
  - Iris synechiae: old uveitis, previous surgery
  - Chronic Adies tonic pupil
  - Physiologic anisocoria
- **DILATED, FIXED PUPIL**
  - Iris pathology: sphincter tear, iris atrophy
  - Mydriatics: atropine, scopalamine, mydriacil, cyclogyl
  - Adies tonic pupil
  - III rd nerve palsy
  - Physiologic anisocoria

- **CHECK LIGHT REFLEX**
- **COMPARE ANISOCORIA IN DARK AND LIGHT**
- **H/O SURGERY/TRAUMA/UVEITIS**
- **IRIS PATHOLOGY**
- **LOOK FOR PTOSIS or OPHTHALMOPLEGIA IPSILATERAL TO THE LARGER PUPIL**
- **LOOK FOR NEAR CONSTRICION (LIGHT NEAR DISSOCIATION)**
- **PTOSIS OR OPHTHALMOPLEGIA**
- **ISOLATED FIXED AND DILATED PUPIL**
- **NO NEAR RESPONSE**
- **NO SECTORAL CONTRACTIONS**
- **NIGHT RESPONSE PRESENT**
- **VERMIFORM MOVEMENTS**
- **LOSS OF ACCOMODATION**

**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

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>severe pain</td>
<td>new onset subnormal acuity</td>
<td>irregular pupil</td>
</tr>
<tr>
<td>deformed globe</td>
<td>corneal or scleral laceration</td>
<td>corneal clouding</td>
</tr>
<tr>
<td>eyelid lacerations which -involve the lid margin</td>
<td>hyphema</td>
<td>severe lid swelling</td>
</tr>
<tr>
<td>-canaliculus</td>
<td>? intraocular foreign body</td>
<td>severe conjuctival chemosis</td>
</tr>
<tr>
<td>-deep, prolapsed fat</td>
<td>loss of red reflex</td>
<td>proptosis</td>
</tr>
</tbody>
</table>

### REFER URGENTLY (within 48 hours)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>photophobia</td>
<td>diplopia</td>
</tr>
<tr>
<td>foreign body sensation</td>
<td>large corneal abrasion</td>
<td>suspected laceration of globe</td>
</tr>
<tr>
<td>suspected orbital wall fracture</td>
<td>moderate eyelid swelling or chemosis with normal vision</td>
<td></td>
</tr>
</tbody>
</table>

### 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)
- superficial 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)

<table>
<thead>
<tr>
<th>DRUG</th>
<th>Complications</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| 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 accommodation  
• 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

<table>
<thead>
<tr>
<th>CLASS</th>
<th>DRUG</th>
<th>OCULAR</th>
<th>SYSTEMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anesthetics</strong></td>
<td>• Proparicaine</td>
<td>• Epithelial keratopathy</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• Tetracaine</td>
<td>• should be restricted for exam only, never to be used as an analgesic</td>
<td></td>
</tr>
<tr>
<td><strong>Antimicrobials</strong></td>
<td>• Neomycin (many brands)</td>
<td>• Eyelid or facial dermatitis</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• Gentamicin (many brands)</td>
<td>• Keratitis with long term use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tobramycin (Tobrex)</td>
<td>• none</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Erythromycin (Ilotycin)</td>
<td>• none</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• Ciprofloxin (Ciloxan)</td>
<td>• corneal deposits</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Norfloxacin (Chibroxin)</td>
<td>• none</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Polymixin</td>
<td>• none</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• Trimethoprim-polymin (Polytrim)</td>
<td>• none</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• Sulfacetamide</td>
<td>• eyelid dermatitis</td>
<td>Stevens Johnson</td>
</tr>
<tr>
<td><strong>Antivirals</strong></td>
<td>• Trifluridine (Viroptic)</td>
<td>• epithelial keratopathy</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• Vidarabine (Vira A)</td>
<td>• conjunctivitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Idoxiuridine (Herplex, Stoxil, Dendrid)</td>
<td>• lacrimal punctal stenosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Acyclovir (Zovirax)</td>
<td>• none</td>
<td></td>
</tr>
<tr>
<td><strong>Artificial Tears</strong></td>
<td>• many brands</td>
<td>• none</td>
<td>• none</td>
</tr>
<tr>
<td><strong>Glaucoma</strong></td>
<td>• Epinephrine (Epifren, Glaucan)</td>
<td>• conjunctival hyperemia</td>
<td>tachycardia</td>
</tr>
<tr>
<td></td>
<td>• Dipivefrin (Propine)</td>
<td>• black conjunctival deposits</td>
<td>hypertension</td>
</tr>
<tr>
<td></td>
<td>• Timolol (timoptic)</td>
<td>• no significant complications</td>
<td>tremor</td>
</tr>
<tr>
<td></td>
<td>• Betaxalol (betoptic)</td>
<td>• Bradycardia</td>
<td>anxiety</td>
</tr>
<tr>
<td></td>
<td>• Levobunolol (Betagan)</td>
<td>• Bronchospasm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Carteolol (Ocupress)</td>
<td>• hypotension, syncope</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Metipranolol (Optipranolol)</td>
<td>• reduced libido</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Acetozolamide (Diamox)</td>
<td>• lethargy and depression</td>
<td></td>
</tr>
<tr>
<td><strong>Cholinergics</strong></td>
<td>• Pilocarpine</td>
<td>• induced myopia</td>
<td>Stevens Johnson</td>
</tr>
<tr>
<td></td>
<td>• Prednisilone (many brands)</td>
<td>• constriction</td>
<td>Renal stones</td>
</tr>
<tr>
<td></td>
<td>• Dexamethasone (many brands)</td>
<td>• conjunctival injection</td>
<td>Paresthesias</td>
</tr>
<tr>
<td></td>
<td>• Medrysone (HMS)</td>
<td>• induced myopia</td>
<td>Nausea</td>
</tr>
<tr>
<td></td>
<td>• Fluoromethalone (FML)</td>
<td>• Headache or brow ache</td>
<td>Dysgeusia</td>
</tr>
<tr>
<td><strong>Steroids</strong></td>
<td>• Medrysone (many brands)</td>
<td>• ocular perforations in patients with necrotizing inflammation</td>
<td>Aplastic anemia</td>
</tr>
<tr>
<td></td>
<td>• Fluoromethalone (FML)</td>
<td>• glaucoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• moderate myopia</td>
<td>• cataract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• severe myopia</td>
<td>• exacerbate viral and fungal keratitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• induced myopia</td>
<td>• none</td>
<td></td>
</tr>
</tbody>
</table>
HIEROGLYPHICS OF THE EYE EXAM

Right eye always above left

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)

PCIOIL = POSTERIOR CHAMBER INTRAOCULAR LENS,
ACIOIL = ANTERIOR CHAMBER IOL

Snellen acuity 20/25, plus 1 letter on next line; (-) minus indicates number of missed letters on same line

Pinhole vision; improvement indicates uncorrected refractive error

Ishihara book of .. color plates read total plates shown;

Intraocular pressure Normal < 22 mm Hg

Vision tested with glasses (or without corrections)

CF= Counting fingers at 2 feet
HM=Hand motion
LP= Light perception
NLP= No light perception

Near vision expressed in "Jaeger" units
J1+ = 20/20
J1 = 20/25
J3 = 20/40
J10 = 20/100
etc

Method used to measure intraocular pressure; e.g. Applanation, Tonopen (tono), Finger Palpation (FP), Schiotz

Time of measurements
Ocular hypotensive meds, time of last dose

Current glasses wearing expressed as (sphere) + (cylinder) x (axis).
plano = clear glass

Best corrected vision after refraction

Expressed in mm from corneal apex to orbital rim.
> 2 mm difference is abnormal

OD 20/25*1 (PH) 20/20
OS CF at 2'

N 8/8
J1
J 3
C 4/8

T

24 mm
16 mm

OD 21 mm
20 mm

OS 24 mm
16 mm
MOTILITY:

- OCULAR MISALIGNMENT EXPRESSED IN PRISM DIOPTERS (PD)
  \[1 \text{ PD} = \text{light displaced by 1cm at 1 m}\]
- PHORIA is a latent misalignment
- TROPIA is a manifest misalignment.

- NOTATION USED TO QUANTITATE MISALIGNMENT:

  1. ORTHO = both eyes aligned
     \[\text{EX} = 0\]

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

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

  4. Example: Grid shows misalignment 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.

<table>
<thead>
<tr>
<th>RIGHT</th>
<th>LEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 LHT 2 XT</td>
<td></td>
</tr>
<tr>
<td>12 LHT 4 LHT 2 LH</td>
<td></td>
</tr>
<tr>
<td>16 LHT 5 LHT 4 ET</td>
<td></td>
</tr>
</tbody>
</table>
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
ARM D = 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

RD = RETINAL DETACHMENT
WWP = WHITE WITHOUT PRESSURE
RETINAL SCHISIS
CILIIOCHOROIDAL EFFUSION
MELANOMA

LASER SCARS
LATTICE DEGENERATION
RETINAL HOLE

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

OD
OS
COMMON ABBREVIATIONS:

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