Allied Health Personnel's Role in the Management of Ocular Emergencies

Vision Expo East 2022

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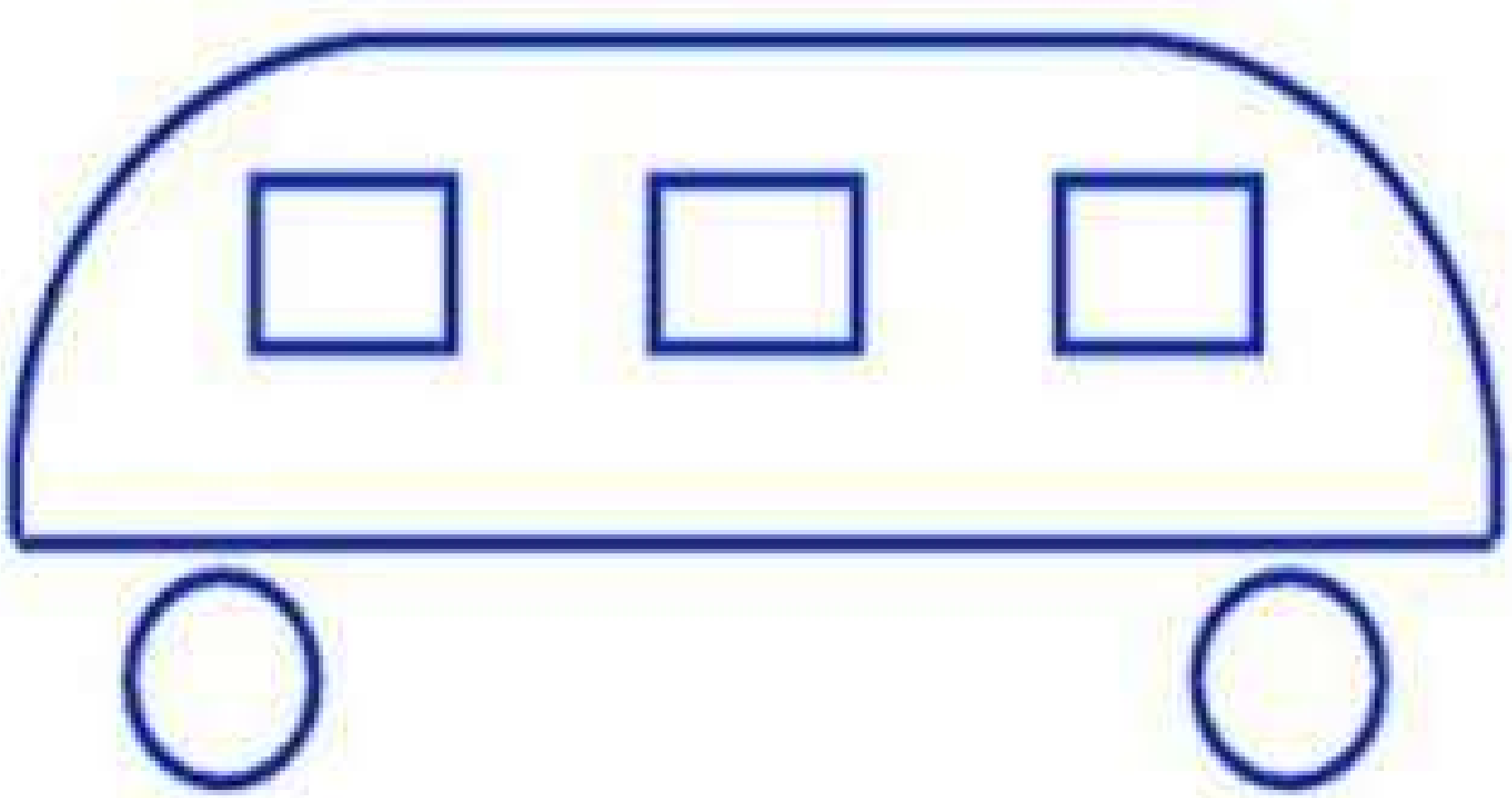
Financial Disclosure

- Neither speaker has any financial disclosures to make as it relates to this presentation.

Which direction is the bus heading?

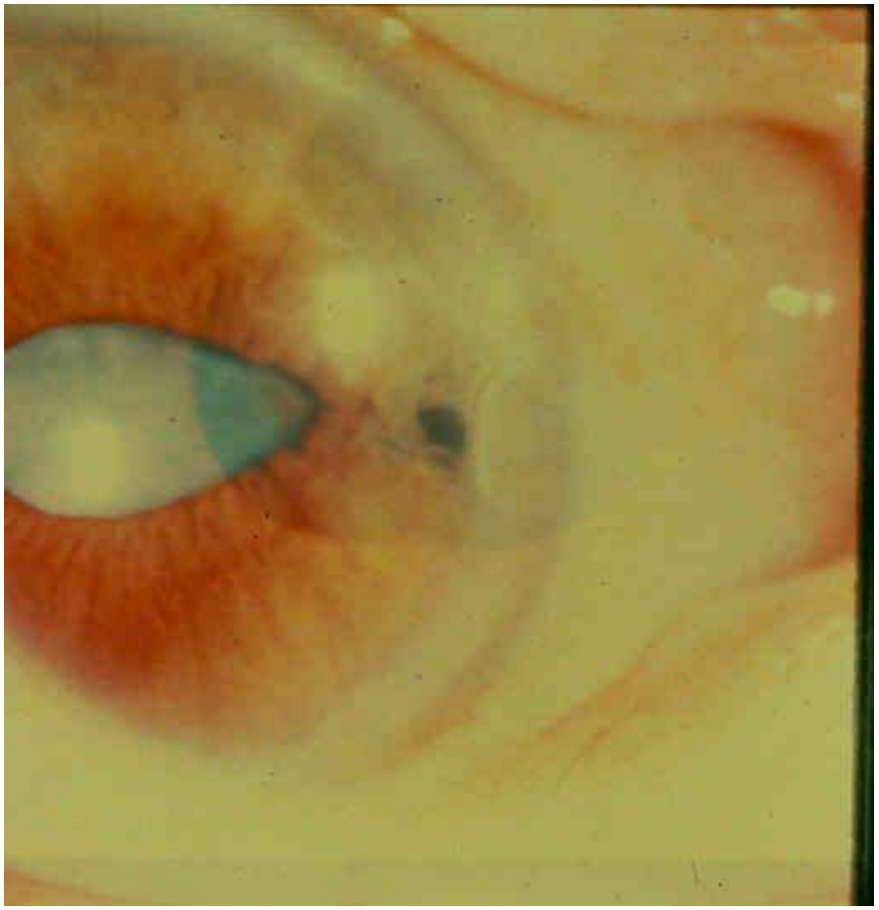


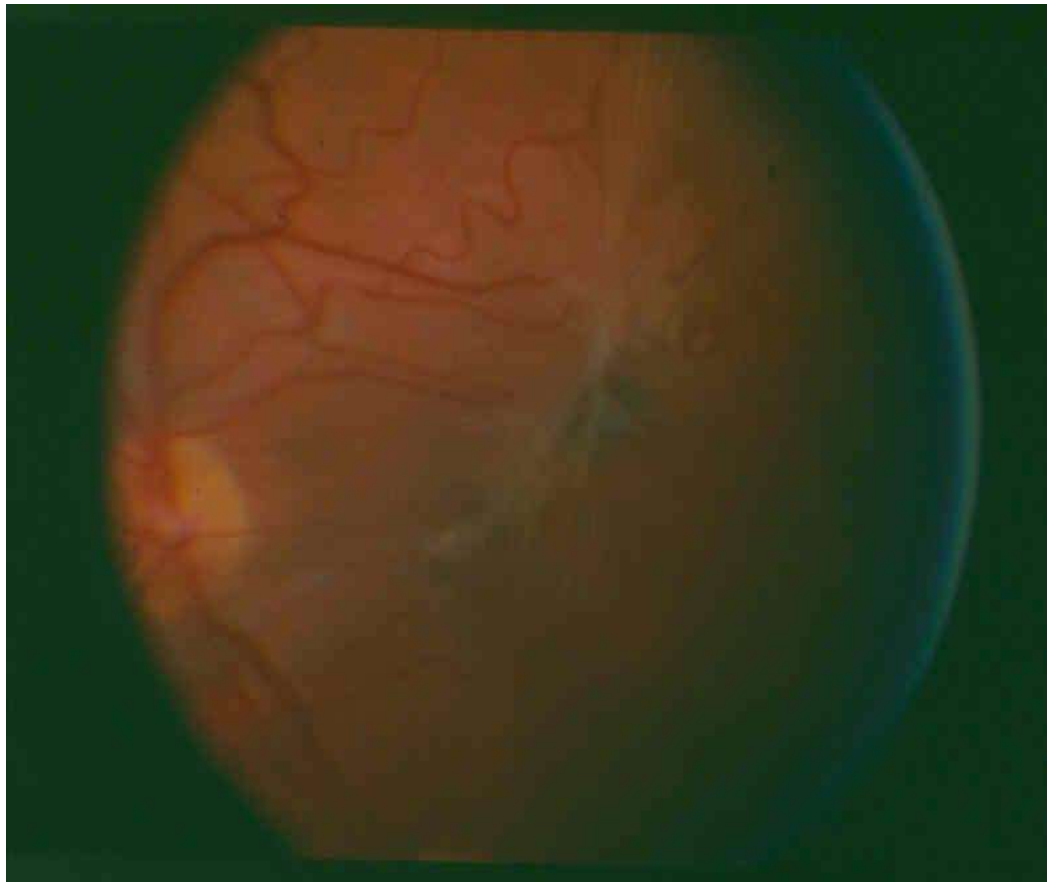
Is this an emergency?

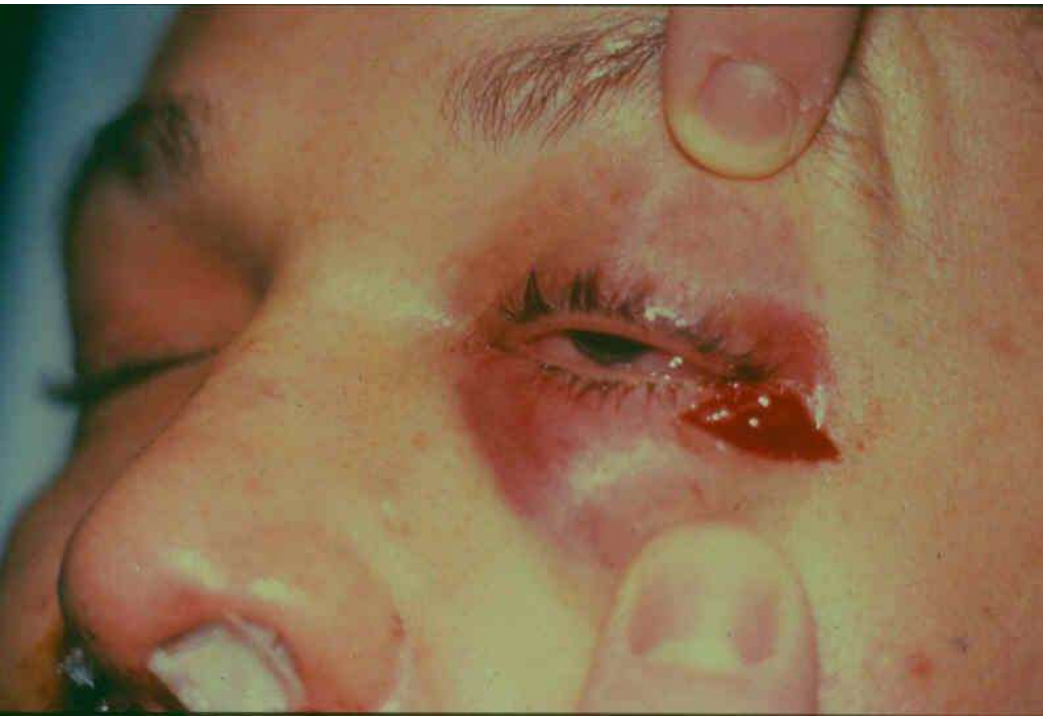
Goals of discussion

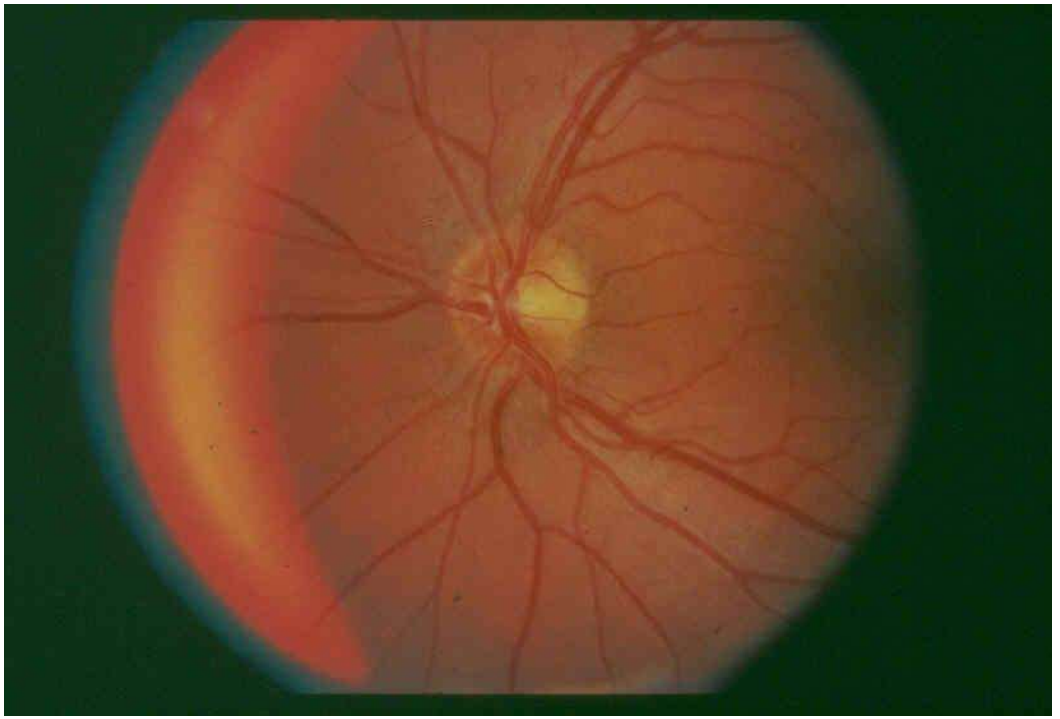
- Triage of ocular emergencies
- Getting prepared for emergencies BEFORE they arrive
- How to evaluate traumatic and non-traumatic ocular emergencies
- How the technician can facilitate the proper management of these conditions

Is this an emergency?









Triage – determining the magnitude of the problem

- **Emergent** – NOW!
- **Urgent** – within 24 hours
- **Routine** – next available appointment

Telephone triage

- **WHO** is calling?
- **WHAT** happened?
- **WHEN** did the problem occur?
- **WHERE** did it happen?
- **HOW** or **WHY** did it happen?

Telephone triage

- How is the vision?
- Associated symptoms?
- Has it happened before?
- Intermittent or constant?
- Relieving factors?
- Quality? (scale of 1-10)
- Quantity?

Triage

- **True emergencies** – may lead to permanent vision loss, requires immediate attention
  - Sudden vision loss
  - Acute angle closure glaucoma
  - Acute chemical burns
  - Central retinal artery occlusion (CRAO)
  - Ruptured globe
  - Penetrating injury
  - Retrobulbar hemorrhage
  - New onset severe pain (particularly post-op)
  - New onset flashes and floaters

Triage

- **Urgencies** – should be seen today to achieve optimal outcome
  - Acute red eye
  - Acute moderate pain / photophobia
  - Acute swelling or protrusion of the eye
  - Acute foreign body
  - Corneal abrasion
  - Contact lens related problems

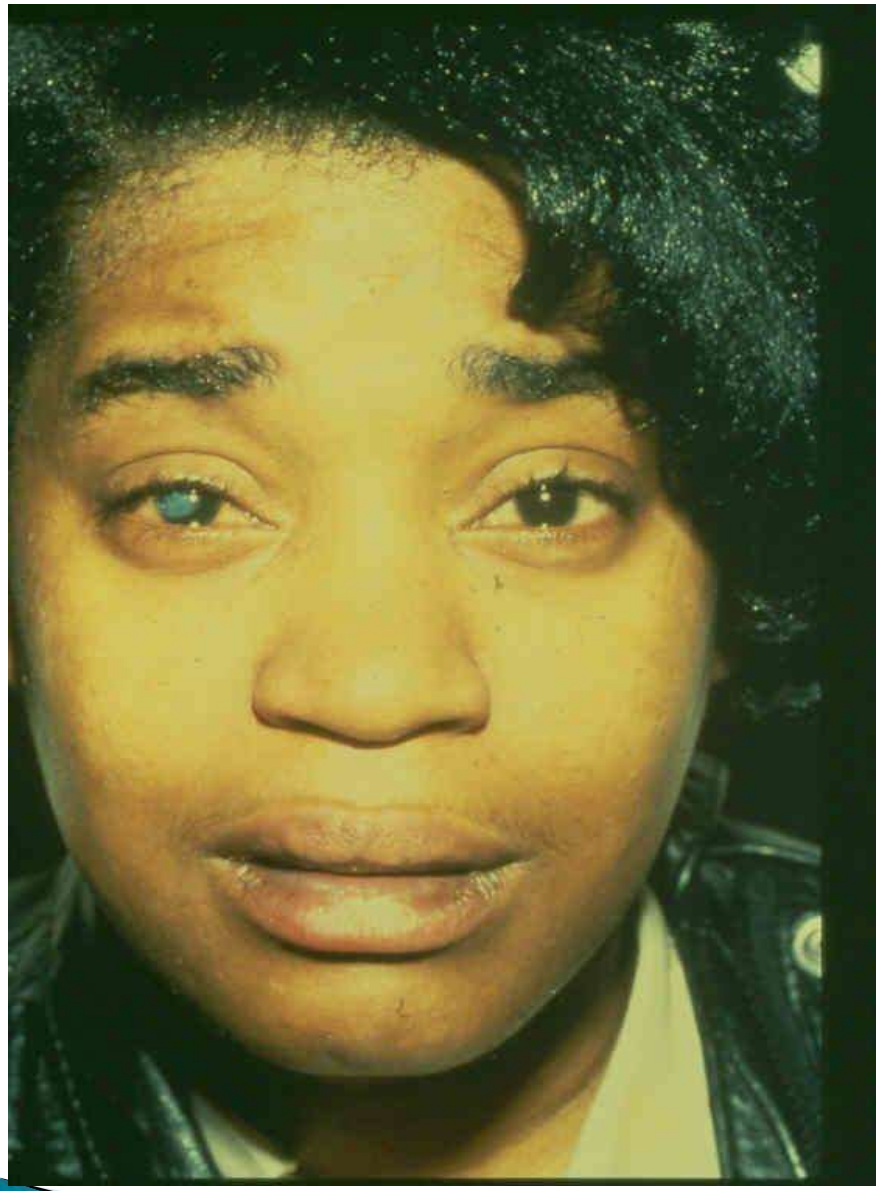
Telephone triage

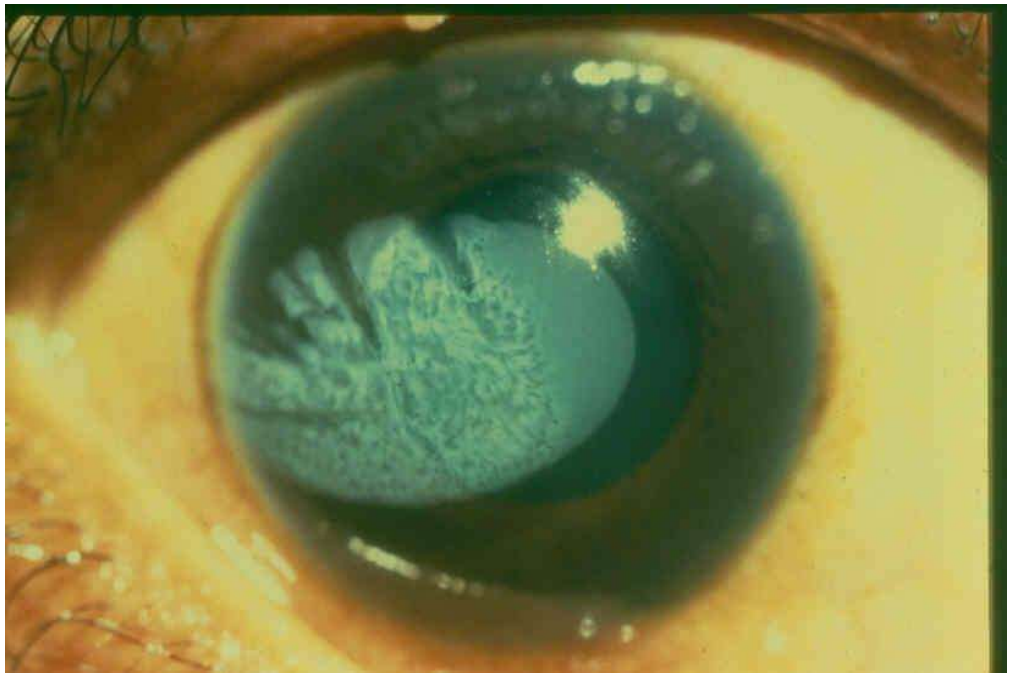
- **Routine**
  - **Staff** must be comfortable they understand what's going on
  - **Patient** must feel comfortable with decision to wait
  - If both sides are not comfortable get another opinion
  - Reassurance is often what is being sought
  - Patients are resistant to emergency management
    - Unscheduled visits mean long waits

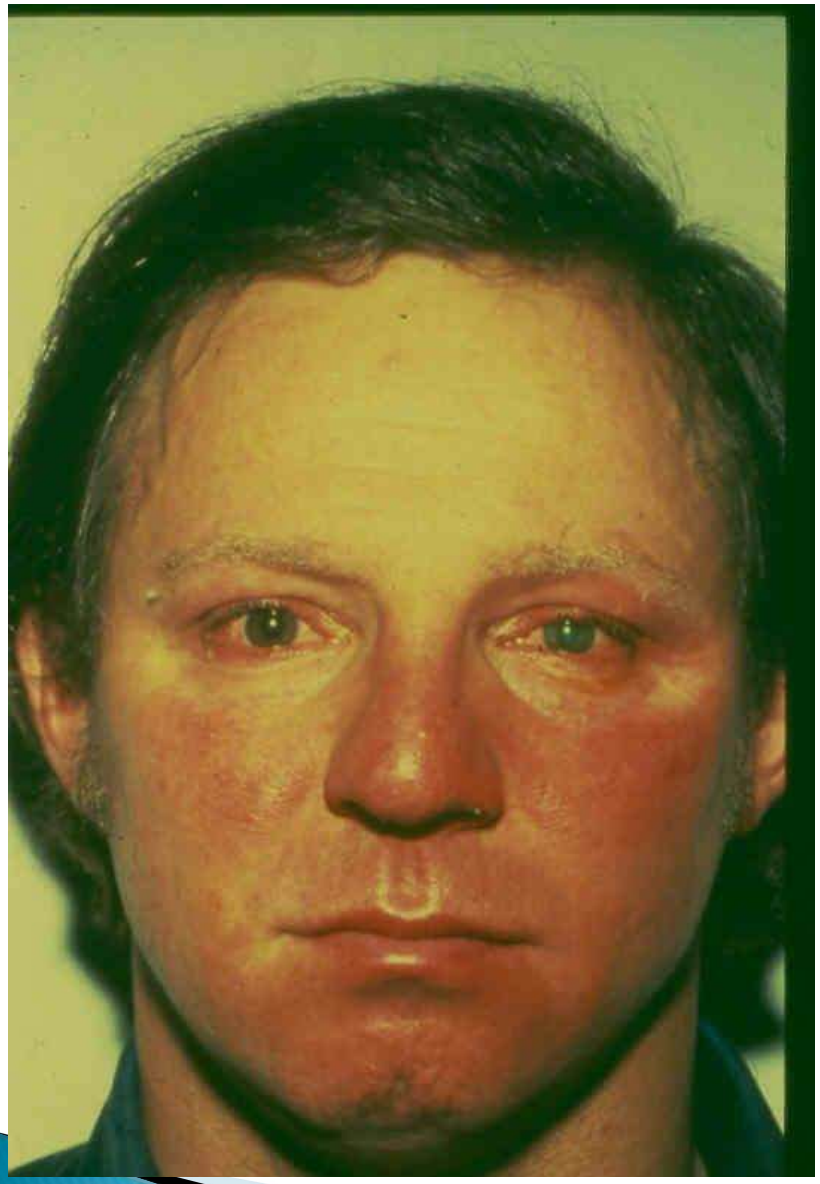
Ocular trauma classification – communicating to the doc

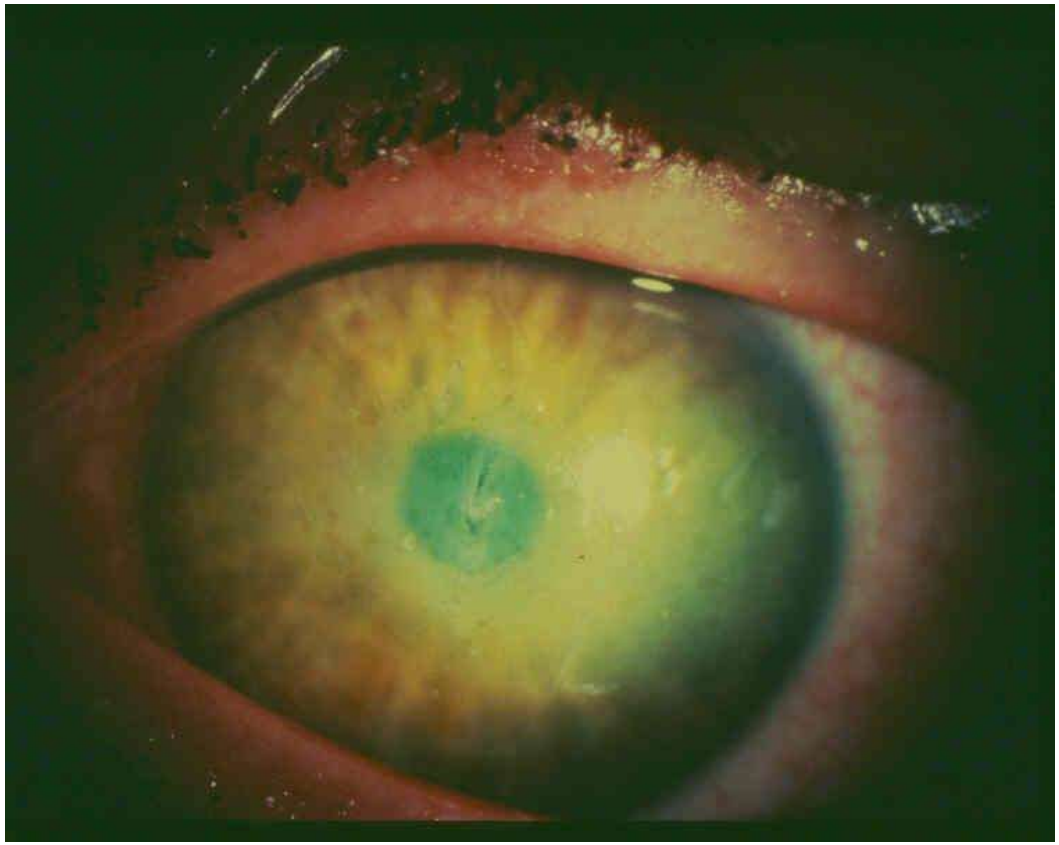
- Type of injury, i.e., mechanism (blunt, penetrating, chemical, thermal)
- Grade of injury, defined by initial VA
- Pupil, presence/absence of APD
- Zone of injury, AP extent of injury (front to back)

Patient arrives at office







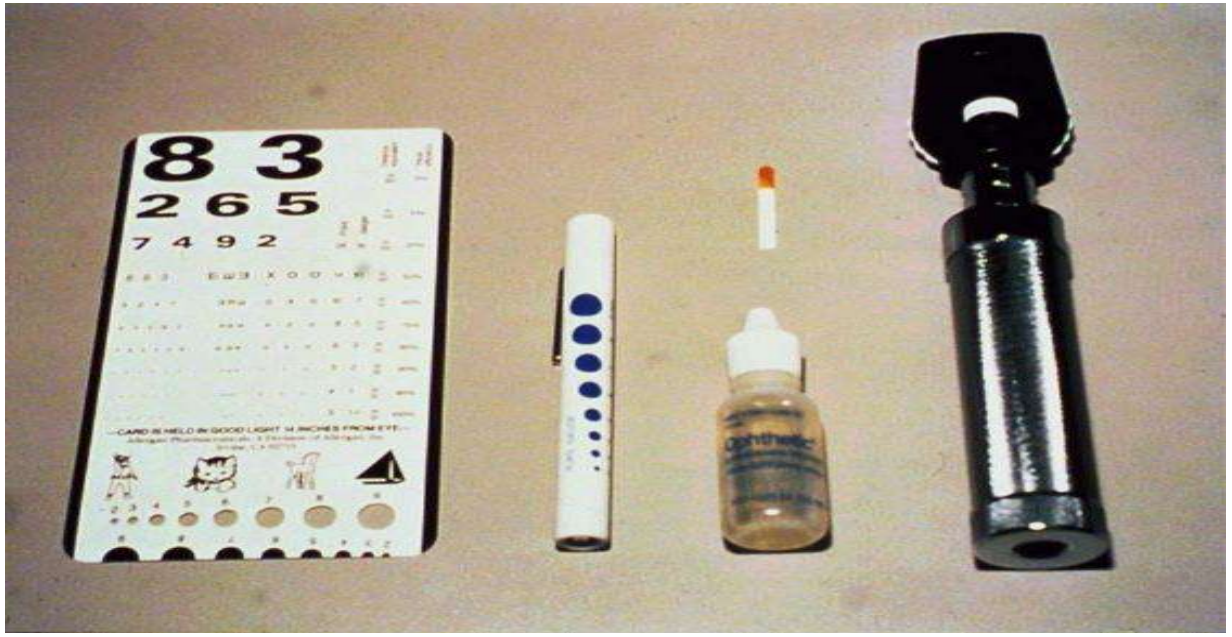


Every office should have a plan for handling emergencies

- Front desk registration process
- Specific exam room
- Specific tech for initial workup
  - Experienced tech
- Have patient remain seated until stable

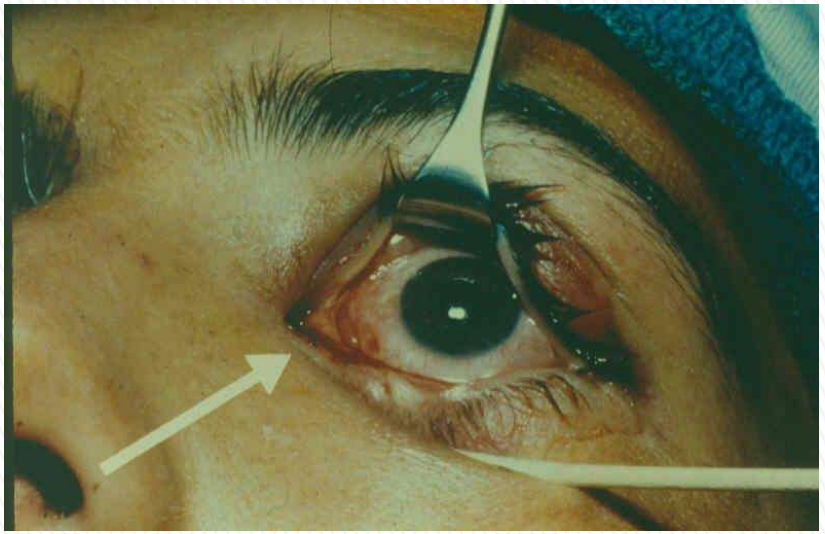
Examination kit

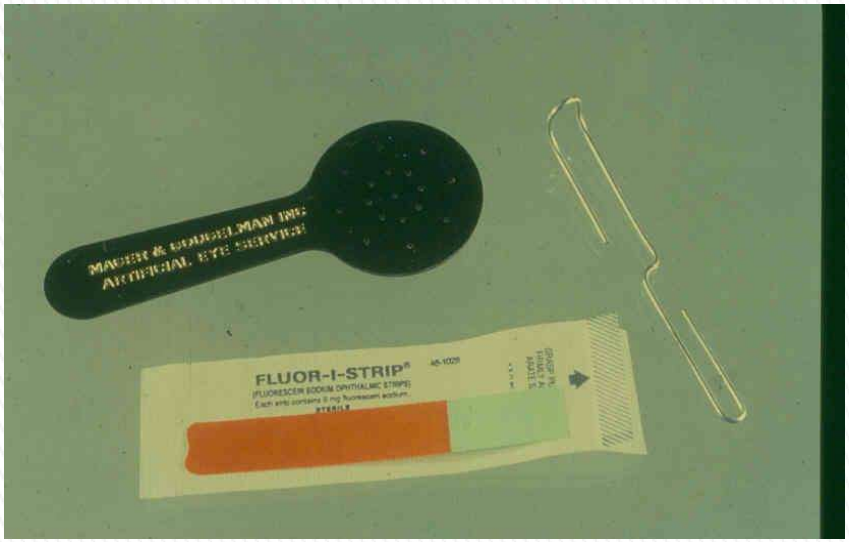
- Means for checking VA
  - +2.50 lens
- Anesthetic drop
- Bright light
- Ophthalmoscop
- Magnification



Examination kit

- Lid retractor

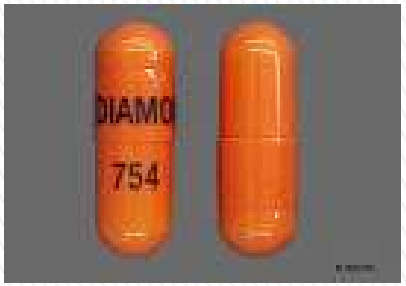




Examination kit

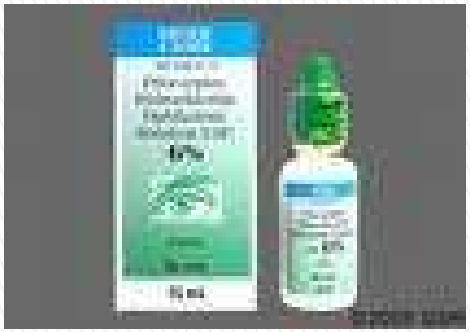
- Fox shield with tape

- Dilating drops



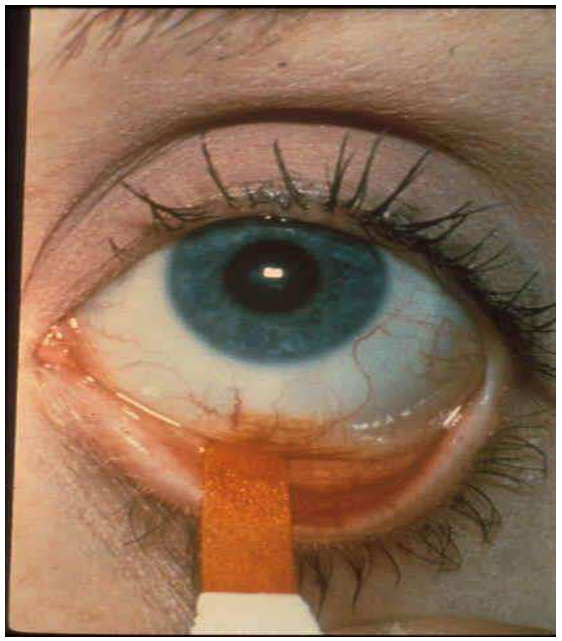
- Diamox

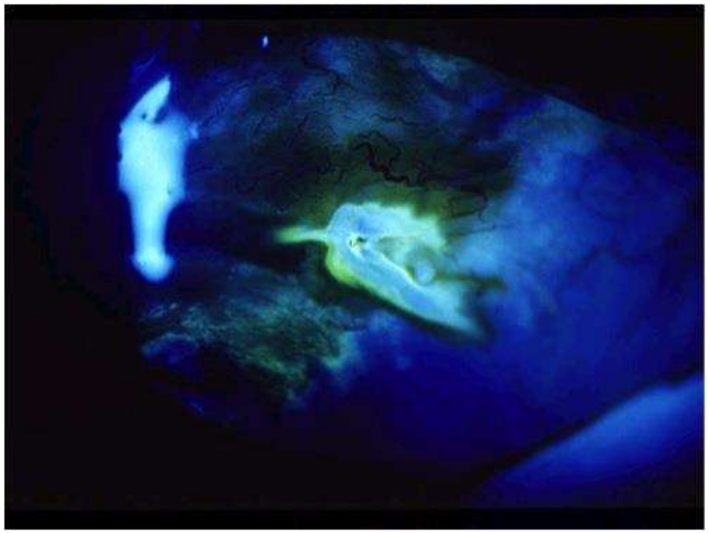
Constricting drops



Sodium fluorescein

- Stains defects of corneal or conjunctival epithelium
- Applanation tonometry
- Seidel test





Other emergency items

- Blood pressure cuff
- pH paper
- Gauze
- Opticlude patches for monocular occlusion
- Thermometer for suspected cellulitis
- 25 gauge needles

Emergency contact list

- 911
- Ambulance
- Local hospital ER
- Local ophthalmologist
  - Retinal specialist
  - Glaucoma specialist
  - Oculoplastics specialist

Other numbers to keep handy

- Radiology center
- Labs
  - To order bloodwork
  - To obtain results
- Child protective services
- Women's health services

Taking the history

- The most important aspect of the examination
  - Determines cause
  - Determines the organization of the exam
  - Establishes prognosis
  - Important for medicolegal considerations
  - Lays the groundwork for the rest of the exam
  - Serves as a bridge to the doc's exam

History

- Past ophthalmic history
  - Prior injuries, prior eye diseases requiring medicines, visit to the eye doctor, hospital admission, surgeries, amblyopia, strabismus
- Past medical history
  - Systemic disease with ophthalmic associations
- Medicines
- Allergies to medicines
- Family history / social history
- Quick review of systems

OPQRST

- O – Onset
- P – Provocation or palliation
- Q – Quality of pain / sensation
- R – Radiation or region
- S – Severity (Pain scale 1-10)
- T – Time (history – recurring, crescendo/decrescendo)

Checking Visual Acuity (VA) in the injured patient

- Important that acuity be established immediately
- Patient in pain will not try hard
- Test acuity with best correction
- Look for asymmetry
- Pinhole occluder

Checking Visual Acuity

- Check with doc to confirm if it's OK to use topical anesthetic to facilitate VA testing

- Lock away topical anesthetics after patient is aware they improve symptoms
  - Anesthetics slow re-epitheializtion, cornea is subject to infectious ulcer

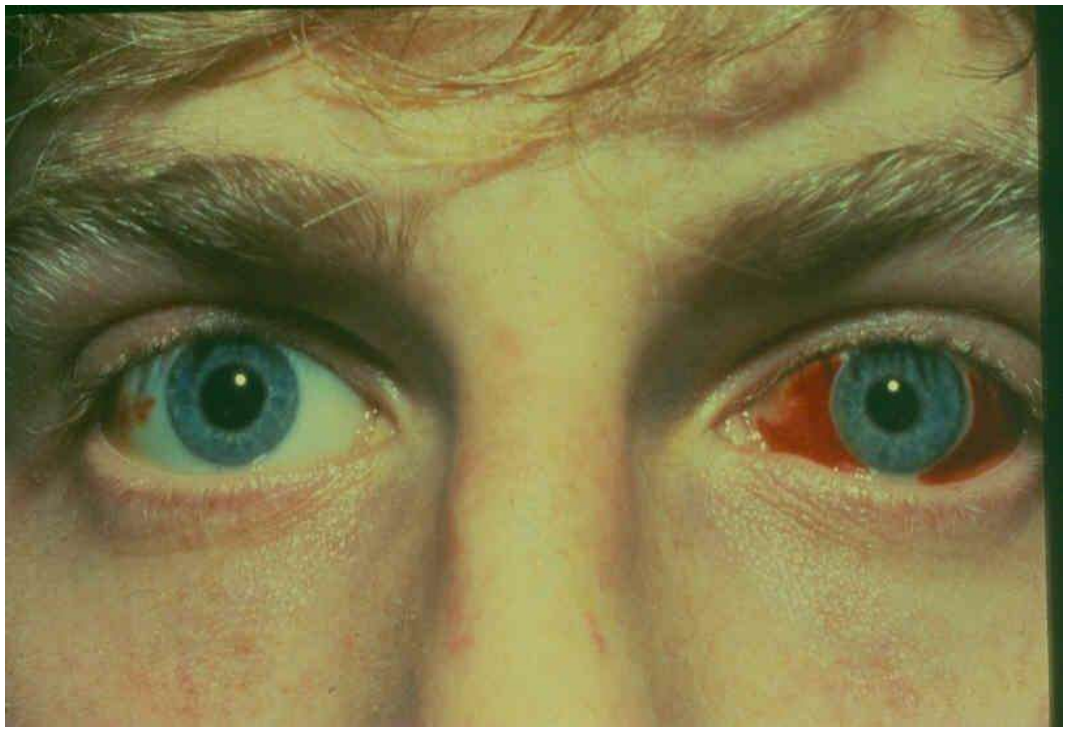
Checking visual acuity

- If Snellen chart isn't available use any reading material, documenting size of print, distance from patient
  - Rosenbaum pocket screener
  - Magazine

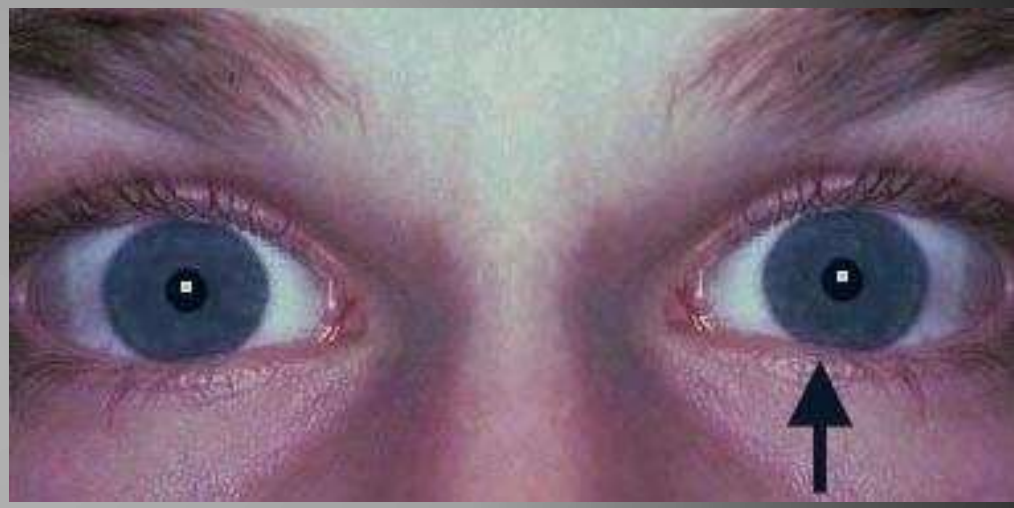
- If counting fingers, record distance from patient

Pupil testing

- Size
- Anisocoria
- Amplitude of constriction
- Concentricity of constriction
- Briskness
- Photophobia on examination
- Marcus Gunn pupil (APD)

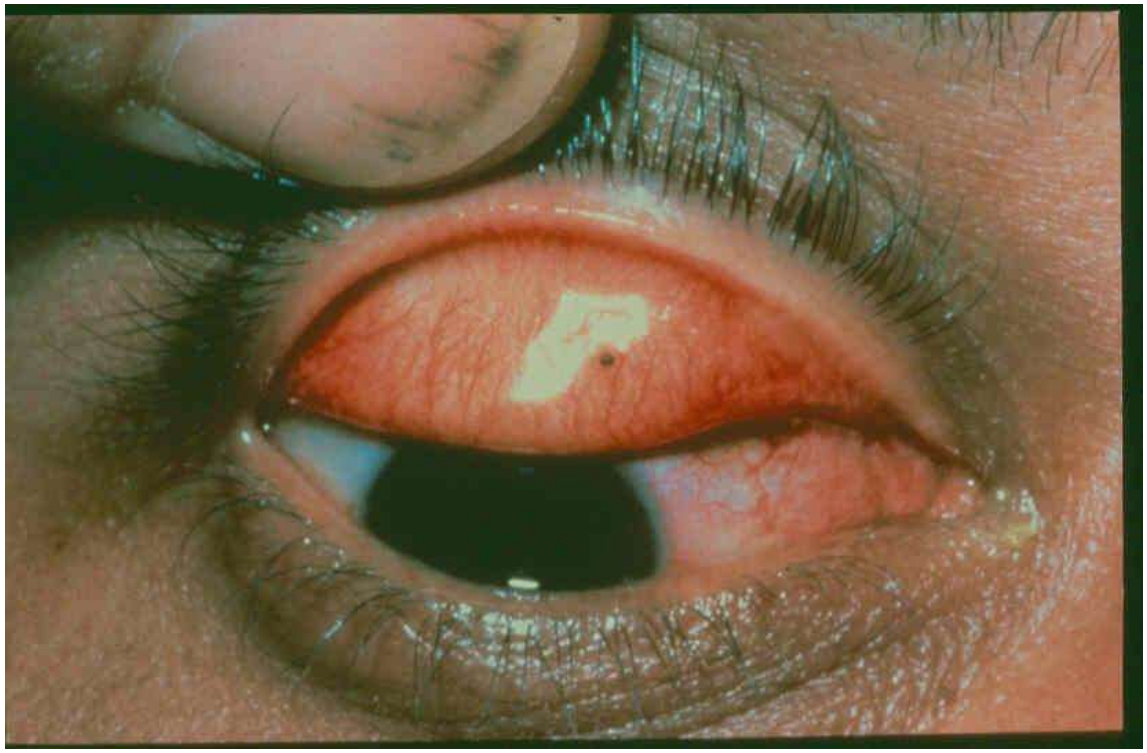


Afferent pupillary defect



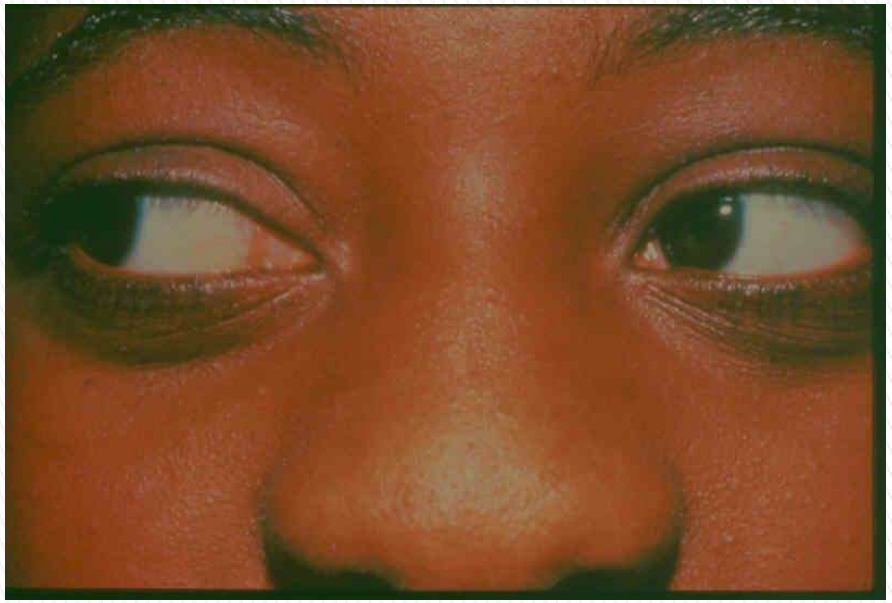
Gross inspection

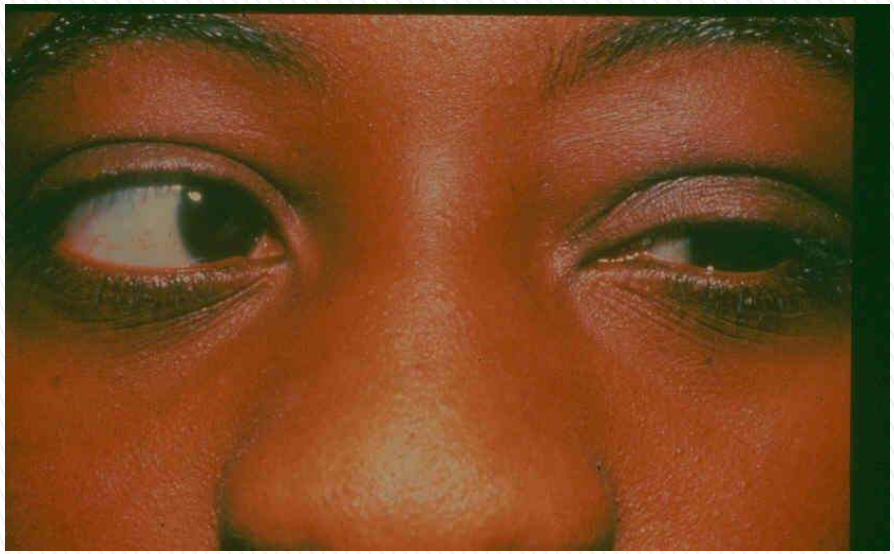
- Lids / lashes / lid eversion
- Conjunctiva
- Cornea
- Anterior chamber
- Iris
- Palpation
- Finger tensions
- Proptosis



Motility testing

- Check all cardinal positions of gaze
- Limitation of motility can suggest paralysis or restriction
- Do not test motility in the suspected open globe

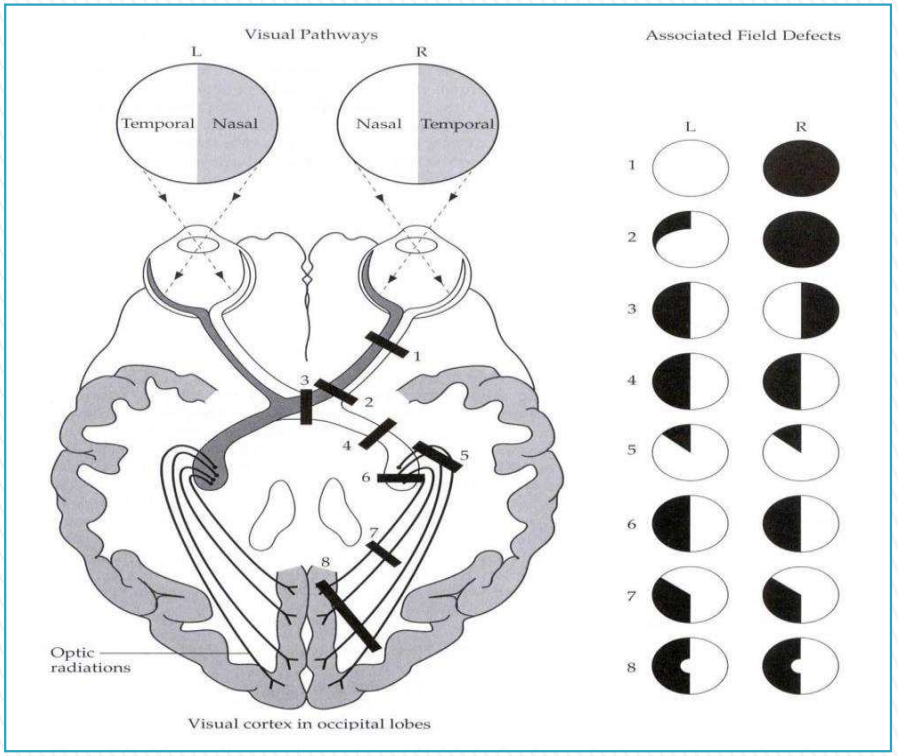




Visual fields

- Check peripheral fields by confrontation, using fingers

- Check integrity of visual pathway using finger counting in 4 quadrants



Tonometry – tonopen, Goldmann applanation

- OK to check pressures with corneal abrasion, keratitis
  - IOP of zero?
- NOT OK to check pressure with suspected open globe

Be on the lookout for non-ophthalmic medical emergencies

Medical emergencies

- Seizures
- Cardiac arrest
- Impending CVA

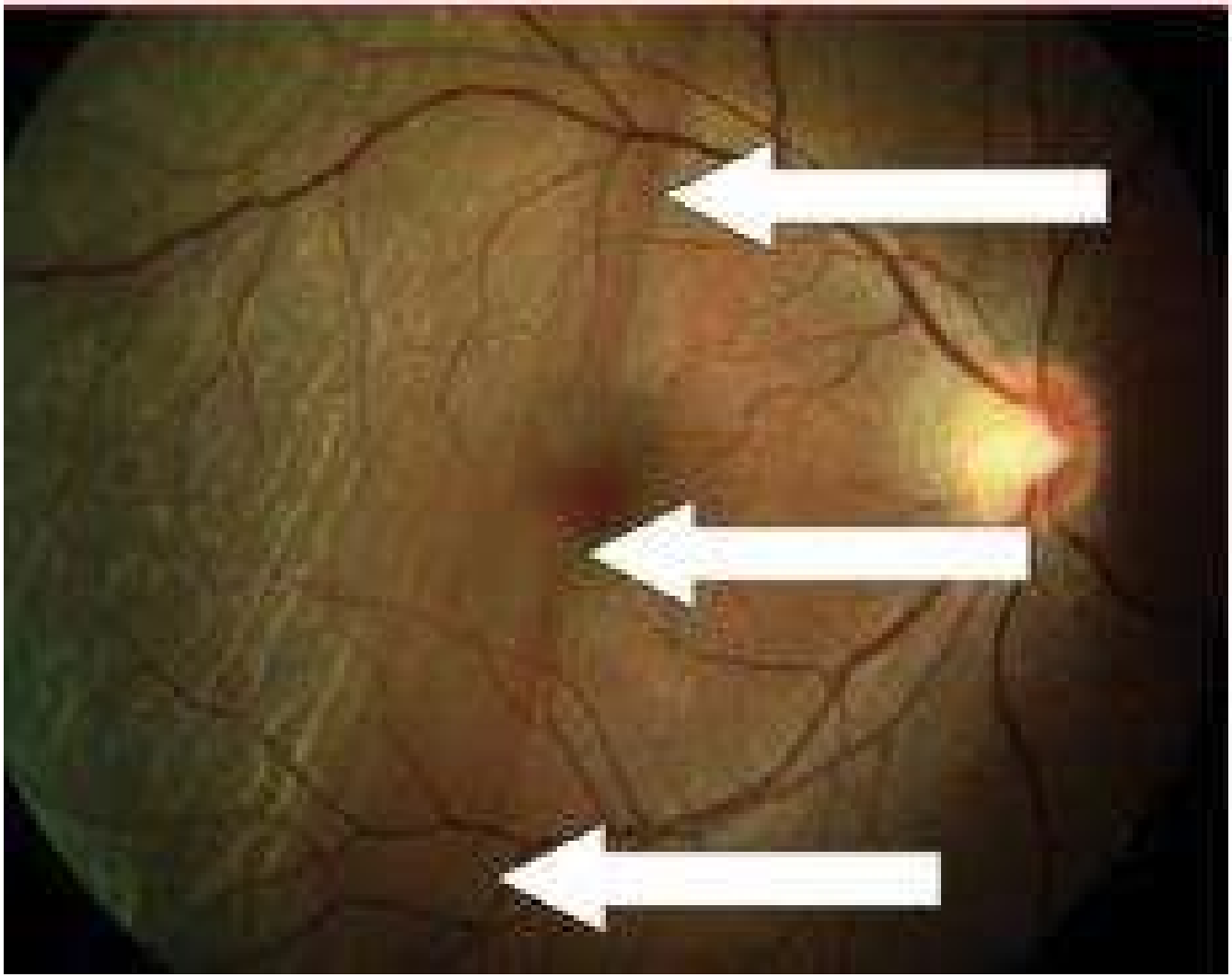
Cases

30 year old female with flashing lights

- Recent LASIK for myopia
- Flashes have persisted for 4 days (has always had floaters)
- Worse with eye movement
- Patient notes a moving gray shadow in temporal periphery
- VA – 20/20
- No headaches
- PMH – migraines

- DIAGNOSIS?

Retinal detachment

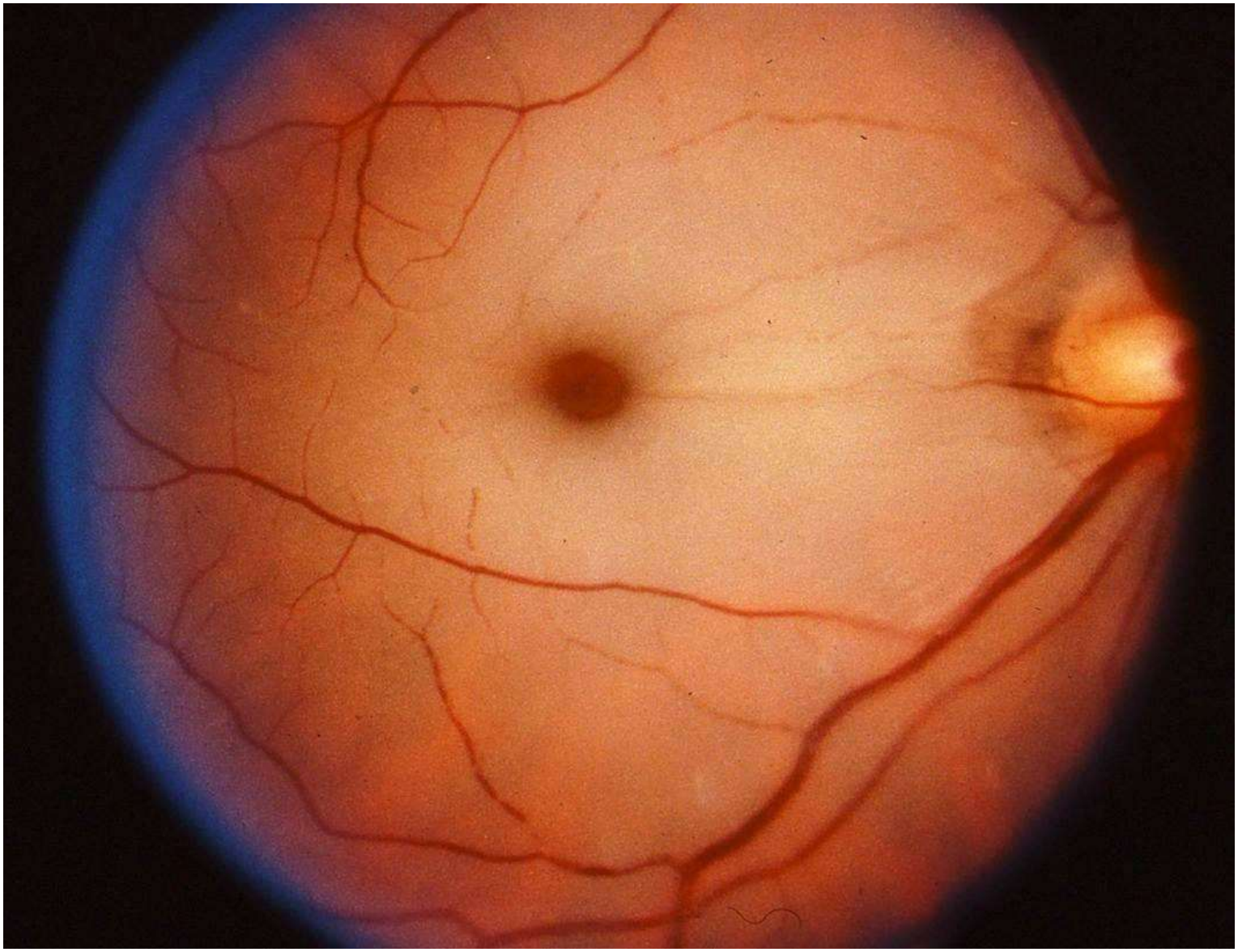


Retinal detachment

- TECH'S ROLE
  - Shield to prevent rubbing
  - Keep patient NPO
  - Number to retinal specialist
  - Number to ER
  - Ambulance for transport to ER
  - Minimal patient movement

80 year old man

- Complains of vision loss OD occurring 45 minutes ago, headache, fatigue
- Past ocular history – previous episodes of transient visual loss
- PMH – HTN, NIDDM, high cholesterol, s/p MI
- VA – CF @ 2 ft OD, 20/25 OS
- + APD
- Doc observes the following retinal finding OD



DIAGNOSIS?

Central retinal artery occlusion

- Suspect in elderly patient with sudden LOV
- HTN, DM, embolism from cardiac valvular disease, carotid atherosclerosis, coagulopathies
- Time is of the essence!
  - Retina cannot tolerate more than 90 minutes of ischemia
  - High association with giant cell arteritis

Central retinal artery occlusion

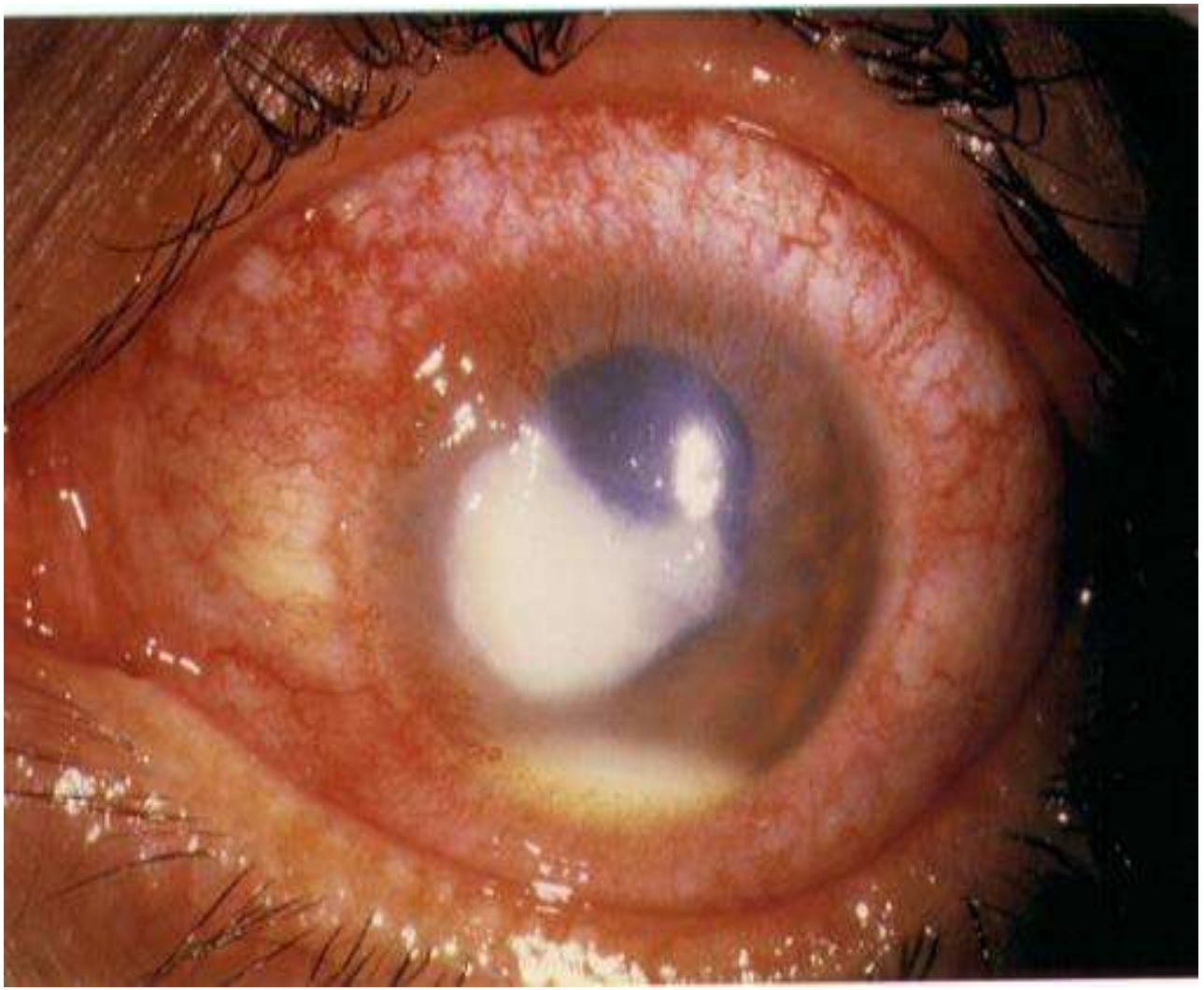
- TECH'S ROLE
  - Number for ophthalmologist
  - 25 gauge needle for paracentesis
  - Brown paper bag for CO2 rebreathing
  - Paperwork for obtaining ESR, C-reactive protein, CBC, platelets, blood sugar, RPR/FTA-ABS, fibrinogen, PT/PTT, lipid panel, echocardiogram, carotid ultrasound
  - BP cuff
  - IOP lowering meds - diamox, brimonidine, dorzolamide, timolol

22 year old man with purulent discharge

- No history of trauma
- No contact lens wear
- VA – 20/50 OU
- Lids – edematous
- Conjunctiva – edema with significant yellow, purulent discharge
- Cornea – diffuse fluorescein staining
- Preauricular nodes – tender and swollen

20 year old college student with painful red eye

- Eye pain OS began upon awakening
- Soft contact lens wearer
- Admits to regularly wearing contact lenses while sleeping
- Past medical, ophthalmic histories – negative
- VA – 20/20 OD, 20/200 OS
- External/slit lamp exam:



Diagnosis?

Bacterial corneal ulcer

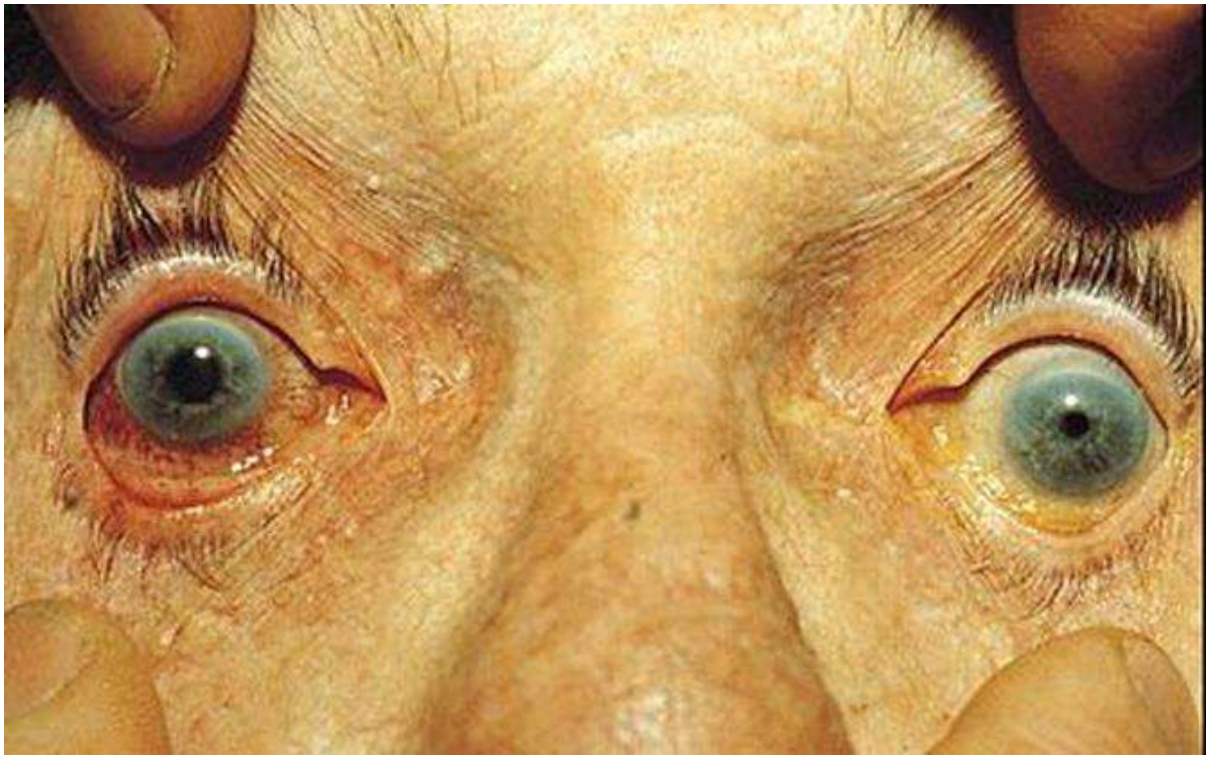
- Corneal epithelial break with underlying white infiltrate
- Reduced oxygen to cornea while sleeping
- High incidence of gram negative corneal ulcers (Pseudomonas aeruginosa) in patients who sleep in contact lenses
- Resulting in debilitating scars

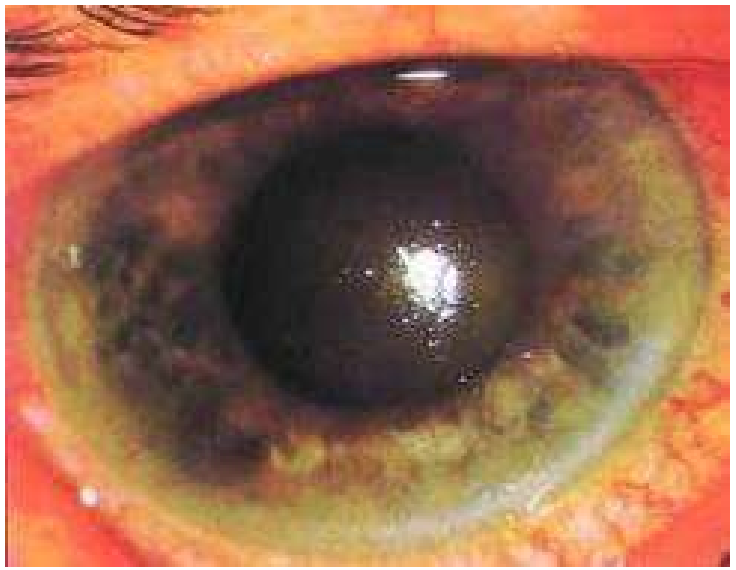
Bacterial corneal ulcer

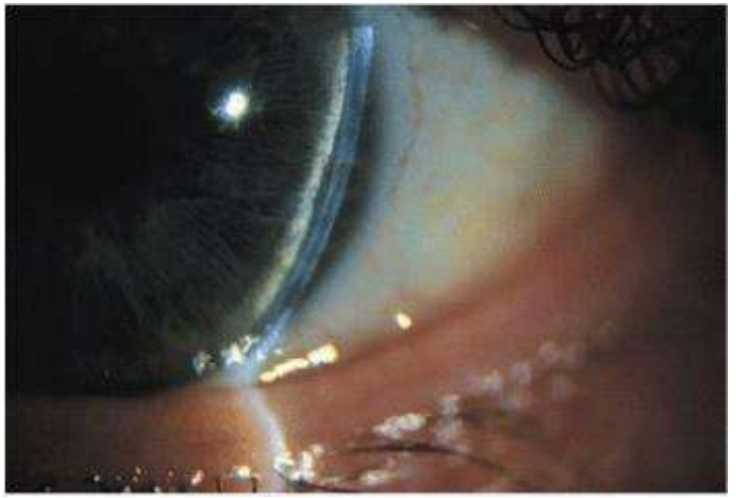
- TECH's ROLE
  - Obtain swabs for culture
  - Do not instill antibiotics prior to culture
  - Number to ophthalmologist/cornea specialist for referral for culture
  - Number to pharmacy that can compound fortified topical antibiotics (can be hard to find)

69 yo woman with severe pain OD

- Pain is associated with nausea and vomiting
- Past medical history – DM, HTN
- VA – CF @ 1 ft, 20/25 OS
- Pupils – minimally reactive to light, slightly dilated
- Conjunctiva – injected
- Cornea – hazy







Diagnosis?

Acute angle closure glaucoma

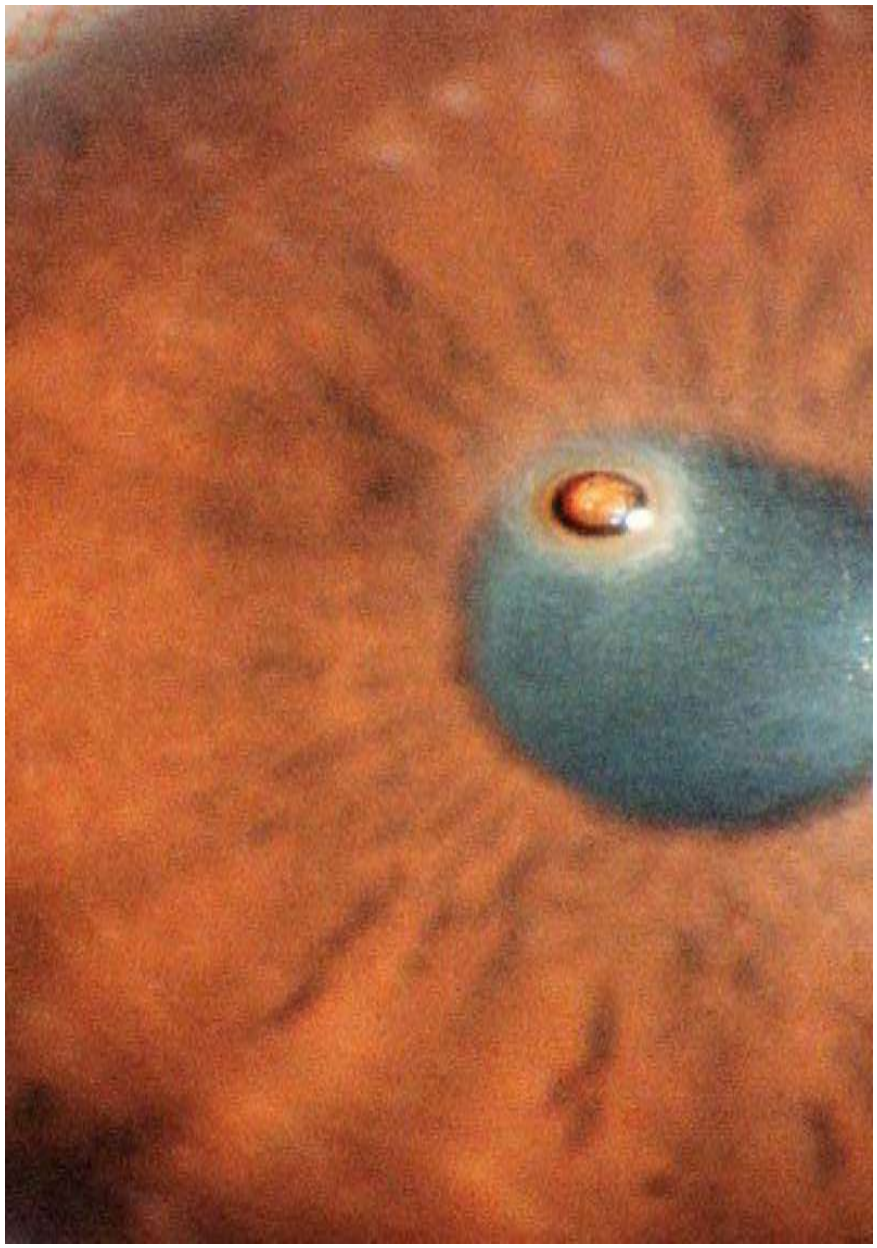
- Eye pain with blurred vision, haloes around lights, and nausea/vomiting
- Acute elevation of IOP
  - IOP greater than 30 mmHg
  - Marked difference in pressure (greater than 20 mmHg) between the two eyes
- Ocular emergency
  - Optic nerve damage from prolonged elevation of pressure
  - Central retinal artery can shut down

Acute angle closure glaucoma

- TECH's ROLE
  - Knowing drugs necessary to lower IOP as quickly as possible
    - Iopidine, timolol, brimonidine, diamox
    - Determine whether patient has sulfa allergy (diamox)
    - Pilocarpine to assist in relieving pupillary block, prepare the eye for definitive laser peripheral iridotomy
    - Taking medicine history to determine whether patient uses drugs that can cause ciliary body effusion (Topamax)
    - Number to ophthalmologist/glaucoma specialist for referral for LPI

27 year old welder with eye pain

- Also c/o tearing, foreign body sensation, blurred vision OD
- Was not aware of anything flying into eye
- Developed discomfort later on in the day
- No past ophthalmic, medical history
- VA – 20/60 OD, 20/25 OS



Diagnosis?

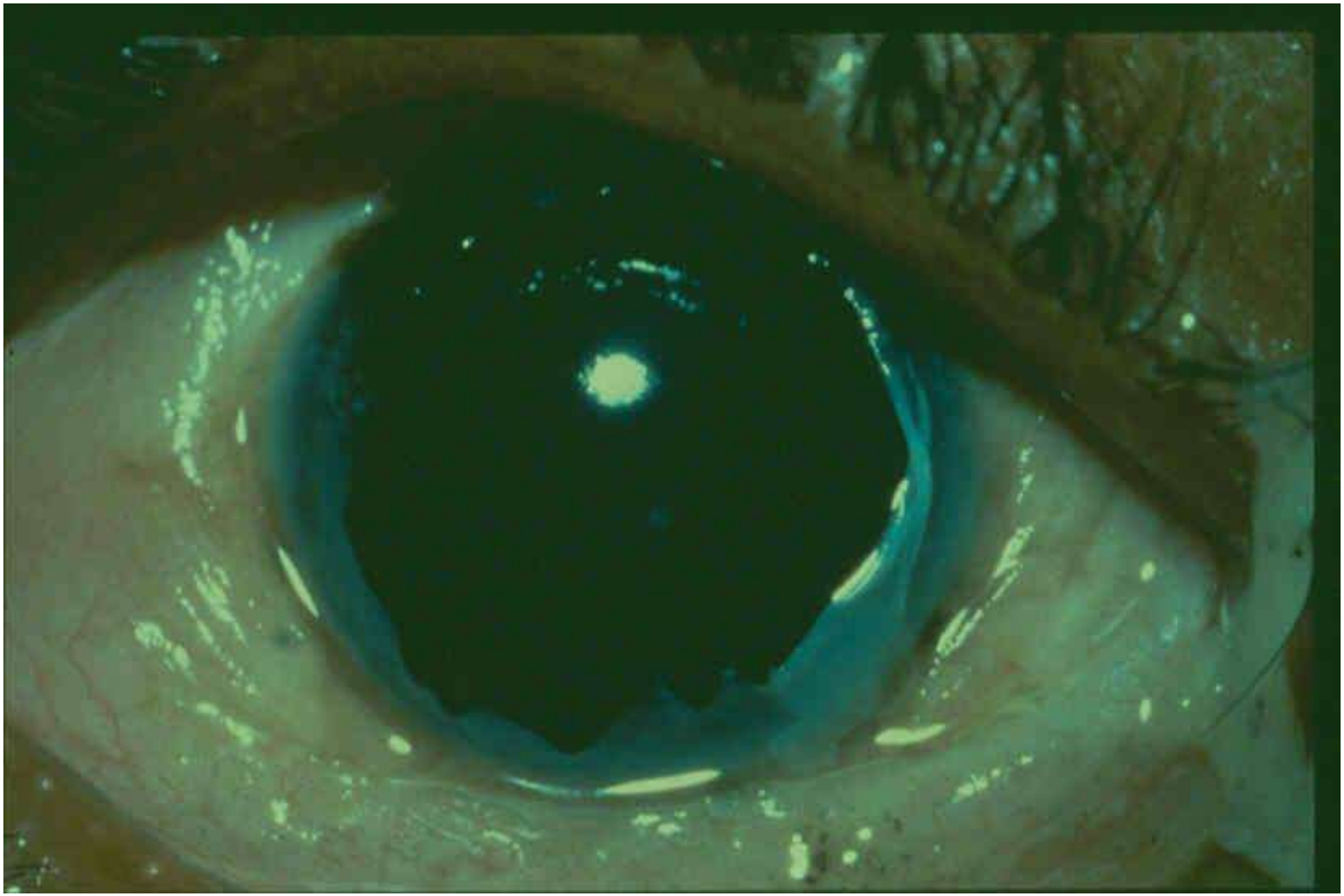
Corneal foreign body

- TECH's ROLE
  - Topical anesthetic
  - Removal
    - Irrigation
    - Cotton swab
    - 25 gauge needle or burr
  - Cotton swab to evert upper lids, sweep fornices for additional foreign material
  - Topical NSAID
  - Topical antibiotic
  - Topical cycloplegic
  - +/- patching
  - +/- oral NSAID, percocet or tylenol #3

If worker states that while welding or grinding metal he felt something hit his eye, what is your concern?

41 year old woman splashed with bleach while cleaning floors

- Now with significant pain, decreased vision
- Unable to open eye
- Visual Acuity (with difficulty) –
  - CF OD @ 1 foot
  - 20/50 OS
- No past medical or ophthalmic history

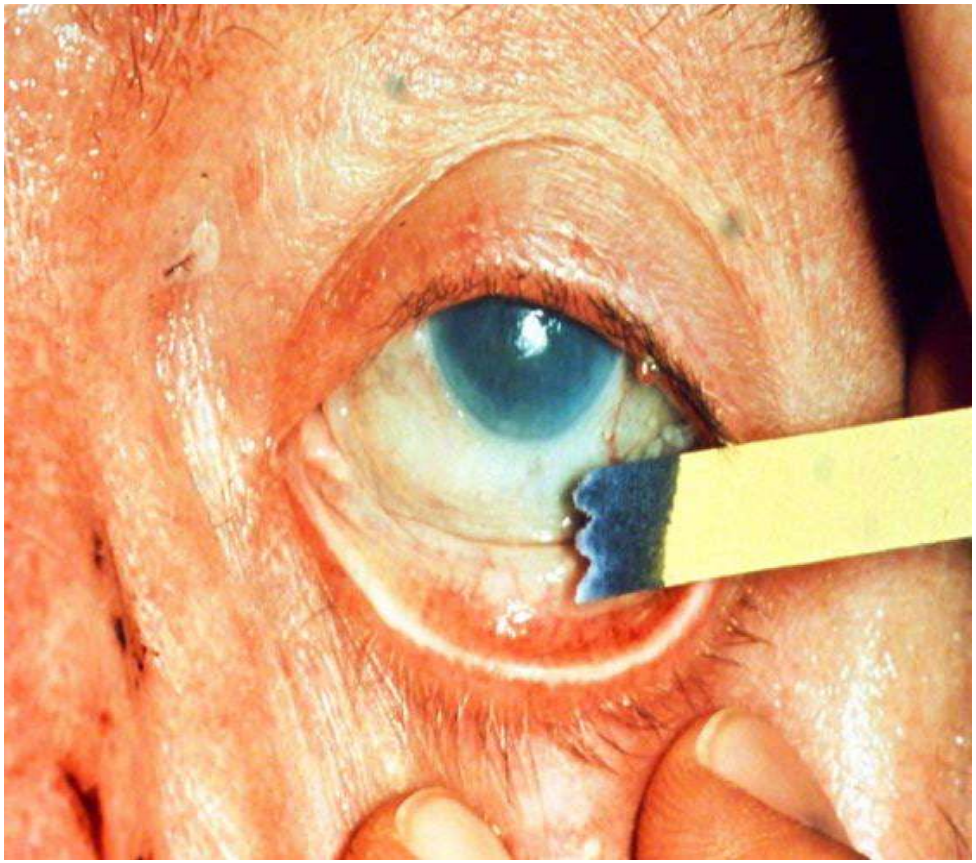


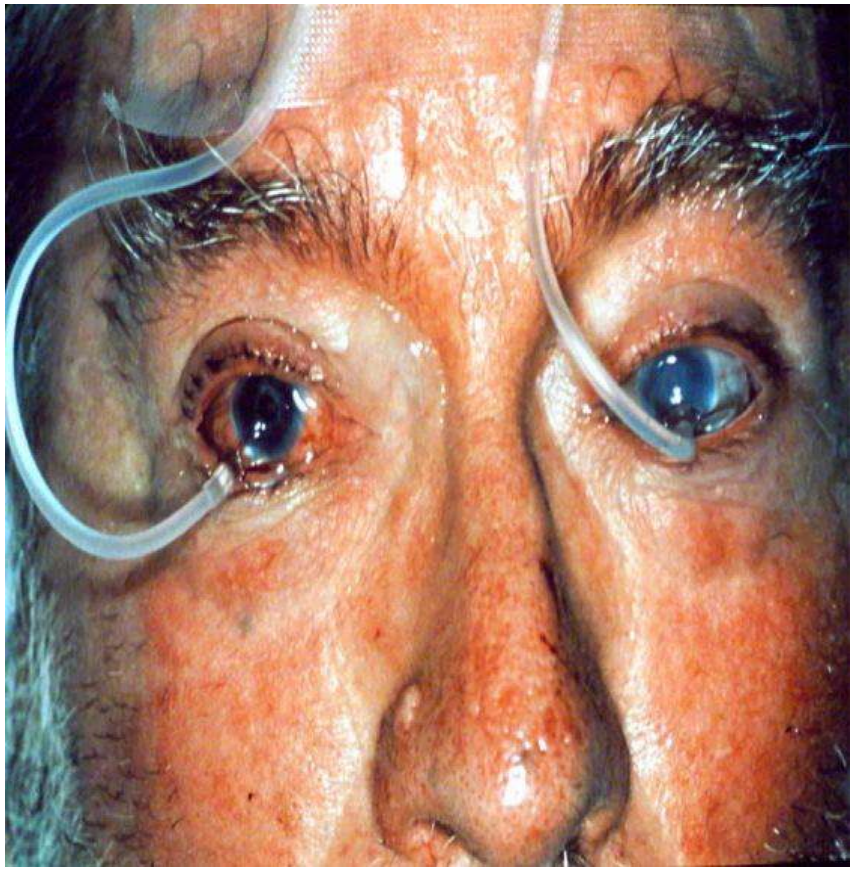
Chemical Injuries

- Use pH paper and fluorescein to evaluate
- Immediately irrigate, irrigate, irrigate!!!
- Continue irrigation until pH = 7
- May require 5-10 liters of irrigation

Management of alkali burns

- Debridement of retained particles
- Topical antibiotics, cycloplegics, steroids
- Tear supplementation
- Antiglaucoma therapy
- Bandage contact lens
- Conjunctival transplantation
- Corneal transplantation

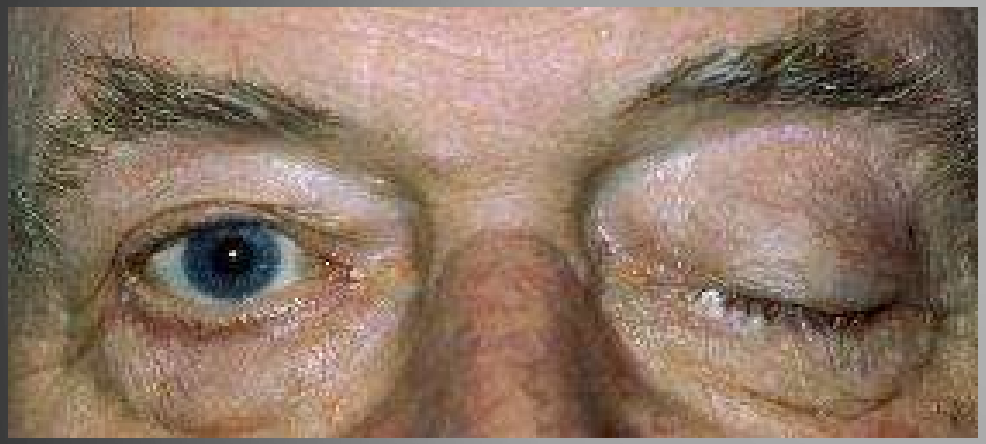




75 year old man c/o acute double vision

- No headache, dizziness, weakness, trauma
- PMH – Diabetes, hypertension, COPD
- Medications – Insulin, HCTZ, metaprolol
- Past ophth hx – negative
- VA – 20/25 OU
- Pupils – 4mm normally reactive –APD

  EOM – OD – full, OS – down and out, unable to adduct, elevate or depress
- Lids – complete ptosis of left upper lid
- Slit lamp, fundus – normal



Approach to the patient with double vision

- What is ALWAYS the first question to ask a patient with a complaint of double vision?

Does the double vision go away when you cover one eye – i.e., is the diplopia monocular or binocular?

- Monocular – likely refractive or ocular problem
- Binocular – likely an isolated cranial nerve problem

Monocular diplopia

- Extra-ocular
  - problems with optical lens or contacts
- Ocular (most common)
  - Lids – chalazion
  - Cornea – infections, trauma, keratoconus (25%)
  - Iris – pharmacologic mydriasis
  - Lens – opacities, cataracts, dislocation
  - Retinal – detachment, CRVO, neovascularization
- Trauma
- No cause established –psychogenic? (12%)

Binocular diplopia

- Cranial nerve palsies – (39%)
- Muscular (14%)
  - Thyroid
  - Myasthenia
- Orbital cellulitis, tumor (4%)
- Orbital trauma – blowout fracture (13%)
- Supranuclear lesions (7%)
- No cause established (11%)

Are there associated signs and symptoms?

- Severe headache?
- Weakness?
- Fatigue?
- Paralysis?
- Clumsiness / unsteady gait?
- Multiple cranial nerve palsies?
  - If so, there are other problems...

Other questions

- Is there any proptosis?
  - infiltrative lesions, myopathy, sinus disease, cellulitis
- Is there any associated ptosis?
  - Bilateral – myasthenia gravis
  - Unilateral – cranial nerve III
- Was the onset acute or gradual?
  - Acute – vascular compression, stroke
  - Gradual – infiltrative lesions, stroke

Other questions

- Is there any variability or remission?
  - Multiple sclerosis, myasthenia gravis
- Is there any pain?
  - Aneurysms, infections- painful
  - Vascular lesions - painless

In our patient…

- Are there associated signs and symptoms? No
- Is the diplopia monocular or binocular? Binocular
- Is there any exophthalmos or proptosis? No
- Is there any associated ptosis? Yes
- Was the onset acute or gradual? Acute
- Is there any variability or remission? No
- Was there any pain? No

Diagnosis?

Cranial nerve III palsy

- Aneurysmal compression common
  - Generally, painful with pupil reactivity affected
- Diabetic III neuropathy ("vasculopathic")
  - Generally, pupil reactivity spared
  - Generally, painless
- Pupillomotor fibers travel on outside III
  - Selectively vulnerable to compression
  - Resistant to ischemia which often affects central portion of III

Cranial nerve III palsy

- TECH's ROLE
  - Obtaining thorough, clear history based on knowledge of conditions associated with clinical findings
  - Number to PCP for consultation re: DM, BP control
  - Number to ophthalmologist/neuroophthalmologist for advice regarding neuroimaging
  - Number to ER if 3rd nerve palsy involves the pupil or is painful