Hyphema - Traumatic

Diagnostic Features
- Trauma
- Decreased vision
- Photophobia
- Pain if acute
- Red cells in the anterior chamber
- Pupil may be abnormally-shaped due to synchiae formation
- IOP may be elevated
- Clot may form in the anterior chamber

Risk Factors
- Sickle Cell Disease
- Previous eye surgery
- Diabetes
- Anticoagulation

Treatment
- Immediate ophthalmology consult
- Head of bed at 45 degrees
- Pain control (No NSAIDS)
- Temporarily stop warfarin, clopidogrel
- Keep quiet avoid activity
- Observe for rebleeding 4-5 days
- Close ophthalmology follow-up
- May need to hospitalize young children

Mechanism
- Aqueus fluid wave from trauma
- Bleeding of the iris vessels or ciliary body

Hyphema - Spontaneous

Complications
- Increased intraocular pressure (32%)
- Corneal Staining
- Re-bleeding at 4-5 days (25%)
- Synechiae formation

Grading of Hyphema
- Grade 1 - less than 1/3
- Grade 2 - 1/3 to 1/2
- Grade 3 - more than 1/2 but not entire AC
- Grade 4 - 8-ball
Corneal Ulcer

**Diagnostic Features**
- Pain
- Photophobia
- Red eye
- Decreased visual acuity
- Tearing
- Branching lesion with terminal bulb
- Recurrent disease possible

**Treatment**
- Topical trifluridine 1% (Viroptic) 9 times/day
- Oral acyclovir 400mg 5 times/day
- Topical Vidarabine 3% ointment (Vira-A) 5 times/day

Herpes Simplex Keratitis

**Diagnostic Features**
- Pain
- Photophobia
- Red eye
- Decreased visual acuity
- Tearing
- Branching lesion with terminal bulb
- Recurrent disease possible

**Treatment**
- Topical trifluridine 1% (Viroptic) 9 times/day
- Oral acyclovir 400mg 5 times/day
- Topical Vidarabine 3% ointment (Vira-A) 5 times/day

Hypopyon - Corneal Ulcer

**Diagnostic Features**
- White blood cells in anterior chamber
- Pain
- Photophobia
- Decreased visual acuity
- Limbic injection
- Epithelial defect (if caused by corneal ulcer)
- Corneal epithelial infiltrate (corneal ulcer)
- AC cell and flare

**Causes**
- Corneal infection (ulcer)
- Enophthalmitis
- Bechet’s disease
- Uvitis
- Ankalosing spondylitis

**Causes (continued)**
- Herpes simplex keratitis
- Kawasaki’s disease
- Sarcoidosis
- Syphilis
- Lyme disease
- Systemic Lupus Erythematosus
- Leptospirosis
- Reiter’s syndrome
- Toxoplasmosis
- Tuberculosis

**Treatment**
- Varies with cause
- Ophthalmology consult

Hypopyon - Uvitis

**Causes**
- Herpes simplex keratitis
- Kawasaki’s disease
- Sarcoidosis
- Syphilis
- Lyme disease
- Systemic Lupus Erythematosus
- Leptospirosis
- Reiter’s syndrome
- Toxoplasmosis
- Tuberculosis

**Treatment**
- Varies with cause
- Ophthalmology consult
Diagnostic Features
- Pain
- Decreased visual acuity
- Limbic injection if foreign body in AC
- Hyphema
- Subconjunctival hemorrhage
- Diplopia
- Teardrop or malshaped pupil
- Extruded vitreous
- Shallow anterior chamber
- Intraocular pressure < 8mmHg
- Seidel’s test positive

Risk Factors
- Paintball participation
- Metal striking occupations
- Sports
- BB-gun and pellet gun use
- Adolescent
- Assault

Associated Injury
- Eyelid lacerations
- Orbital floor fractures
- Traumatic optic neuritis
- Lens dislocation
- Retinal detachment
- Retained foreign body
- Vitreous hemorrhage

Management Principles
- Ophthalmology consult
- Head upright if possible
- Antiemetics
- Narcotic pain medications
- Control hypertension
- Avoid pressure to globe
- CT to detect orbital contents, blood in globe, FB
- Fox shield without gauze
- IV Antibiotics covering Staph and Strep
- Tetanus
Diagnostic Features
- Edeema of the conjunctiva from various causes
  1. Infectious
  2. Allergic
  3. Traumatic
- Purulent discharge if infectious
- Brawny orange edema if allergic
- Pruritis if allergic
- White stringy discharge suggests allergic
- Erythematous eye
- Eyelid edema suggests allergic
- Bloody suggests traumatic or infectious
- Conjunctival papillae suggests allergic
- Bilateral suggests allergic

Diagnostic Features
- May be unable to close eye
- Concern for open globe if chemosis is traumatic
- Visual acuity is usually normal in infectious or allergic chemosis

Treatment
- Depends upon cause
- Hyperacute conjunctivitis with chemosis - immediate ophthalmology consult
- Allergic chemosis is treated with topical and/or systemic antihistamines and cool compresses
- Irrigation if still exposed to allergen
- Traumatic chemosis requires ophthalmology consult to evaluate for open globe and injury to other ocular structures
### Diagnostic Features
- Pain
- Photophobia, direct and consensual
- Corneal epithelial defect with fluorescein stain
- Purulent discharge
- White epithelial infiltrate
- Decreased visual acuity
- Erythematous eye
- Limbal injection
- Cells and flare in the anterior chamber
- Corneal edema
- Contact lens use
- May see hypopyon
- *Staphylococcus, Streptococcus, Pseudomonas*
- Infiltrate without pain suggests corneal scar

### Treatment
- Discontinue contact lens wear
- Ophthalmology consult
- Gram stain
- Culture
- Q1H fortified antibiotic drops
- Pain control
- Steroids frequently used (by ophthalmologist)
- Place a shield if corneal thinning is expected
- Hospitalize if unable to apply Q1H antibiotic drops
- Suspect Acanthamoeba if history of poor contact lens hygiene

### Pearls
- DO NOT PATCH a corneal ulcer
- Proparacaine is not bacteriocidal
- Selected lens cleaning solutions have been implicated as causing corneal ulcers due to bacterial contamination
**Diagnostic Features**
- Superficial lid
- Lid margin
- Lacrimal apparatus
- Septal fat may be exposed
- Search for corneal or scleral laceration
- Establish open globe
- Lid edema
- Periorbital ecchymosis
- Epithelial defect with fluorescein stain
- Hyphema present?
- Entrapment?

**Treatment**
- Tetanus prophylaxis
- ED repair for superficial lacerations that do not involve the lid margin
- Ophthalmology repair for the following:
  - Associated open globe
  - Levator muscle involvement (ptosis present)
  - Lacrimal system involvement
  - Any tissue loss
- Keep wounds moist till repair is made
- Delay repair for heavily contaminated wounds

**Pearls**
- Consider lacrimal involvement with any lid laceration involving the medial third of the upper or lower lids
- Search for corneal or scleral laceration in any lid laceration
Diagnostic Features
- History of blunt trauma
- Foreign body sensation
- Photophobia
- Tearing
- Pain
- Symptoms improved with topical anesthetic
- Corneal epithelial defect (fluorescein uptake)
- Decreased visual acuity
- Air sensitivity
- Watery tearing
- Absence of corneal infiltrate
- Negative Seidel test
- Conjunctival injection
- Mild cell and flare of AC

Diagnostic Features (continued)
- FB under lid
- Blepharospasm
- Lid swelling

Treatment
- Topical antibiotic ointment or drops - erythromycin, polymyxin, bacitracin
- Contact lens wearers - tobramycin, ciprofloxacin, ofloxacin
- Cycloplegic agent (cyclopentolate 1%, homatropine 1%) to decrease ciliary spasm
- Patch only by request
- Topical NSAIDs (ketorolac 0.5% QID or diclofenac 0.1% QID)

Pearls
- Do not use topical anesthetic outside of the ED for long term pain management - may cause corneal inflammation
- Do not patch any injury caused by vegetative material
- Look for foreign bodies underneath lids
- Give tetanus prophylaxis
**UV Keratitis**

**Diagnostic Features**
- Pain, Photophobia
- Corneal edema
- Decreased visual acuity
- Band-like diffuse uptake
- Limbic injection
- Inexperienced welders, snow skiers, beach bums

**Treatment**
- Topical antibiotic ointment or drops
- Cycloplegic agent
- Patch may help comfort
- Topical NSAIDs
- Resolution in 24-48 hours

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**Pterygium**

**Diagnostic Features**
- Chronic irritation from UV light and wind exposure
- Vascularized inflammatory process from nasal side of eye
- Non-emergency

**Treatment**
- Ophthalmology consult for visual disturbance or for cosmetic repair

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**Blebitis**

**Diagnostic Features**
- Infection of surgical bleb used to manage refractory glaucoma
- Pain
- Decreased visual acuity
- Purulent discharge from bleb
- Enophthalmitis
- Photophobia
- Conjunctival injection
- Milky-white cloudy bleb
- Cells and flare of AC
- *Staphylococcus, Streptococcus, Haemophilus*

**Treatment**
- Ophthalmology consult
- Admission for topical and IV antibiotics
**Hordeolum**

**Diagnostic Features**
- Swelling, pain, lid erythema
- Localized tenderness
- Cheezy secretions surrounding lesion
- Blocked sebaceous or meibobian gland

**Treatment**
- Warm compresses QID
- I and D if not improved in 4 weeks
- Follow-up in 24 hours if cellulitis is suspected
- Suspect carcinoma if loss of lashes present

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**Anisocoria**

**Diagnostic Features**
- 1mm difference is 4% of persons
- Usually noticed by others
- Consider pharmaceutical causes
- Recent trauma suggests traumatic mydriasis
- Fever and AMS, suspect meningitis
- Headache and AMS, suspect aneurysm
- Horner’s syndrome?

**Treatment**
- Depends on cause
- Consider ophthalmology consult if uncertain

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**Anisocoria - Sympathimmetic**