

## **Ocular Trauma for the Primary Care Physician**

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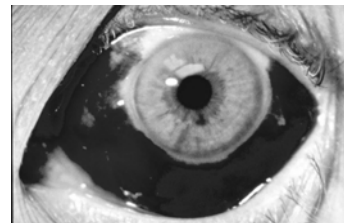
## **Relevance**

- Often those with “minor” eye injuries will first seek evaluation and treatment from their primary care physician.
- Prevention and education is quick and can make a large impact.

## **Prevalence**

- 2.5 million eye injuries each year in the US
- About 75% are male
- More than 1/2 occur at home
  - Most commonly in the yard or garden

## **Subconjunctival Hemorrhage**



## **Subconjunctival Hemorrhage**

- Red eye - patient usually without symptoms
- Often noted by someone else
- Segmental or more rarely 360 degrees
- Bright red blood

## **Subconjunctival Hemorrhage**

- History
  - Very important to elicit any history of trauma to assess risk of more serious injury
- Check visual acuity

## **Subconjunctival Hemorrhage**

- Etiology
  - Often minor trauma
  - Valsalva (coughing, sneezing, etc)
  - More rarely - HTN, bleeding disorder

## **Subconjunctival Hemorrhage**

- Treatment - usually none or artificial tears as needed for comfort
- Do NOT need to stop anti-coagulation medications
- Should resolve in 2-3 weeks, if not need ophthalmic evaluation

## Corneal Abrasion

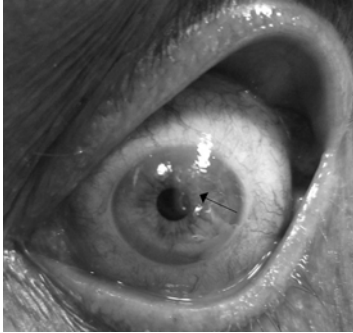


Image from <http://www.wikipedia.org/>

## Corneal Abrasion

- Sharp pain - foreign body sensation
- Photophobia
- Tearing
- May decrease vision depending on location
- Defect stains with fluorescein and cobalt blue light

## Corneal Abrasion

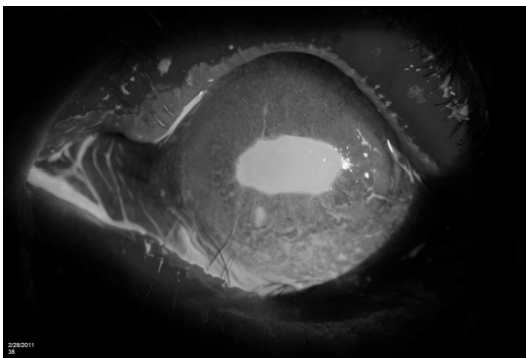


Image from <http://www.wikipedia.org/>

## Corneal Abrasion

- Blunt or sharp trauma
- Eye or eyelid rubbing
- Recurrent erosion (history)
- Evert the lids to look for foreign body

## Corneal Abrasion

- History
  - Details about activity patient was doing when injury occurred
    - Any high velocity projectiles?

## Chemical Injury

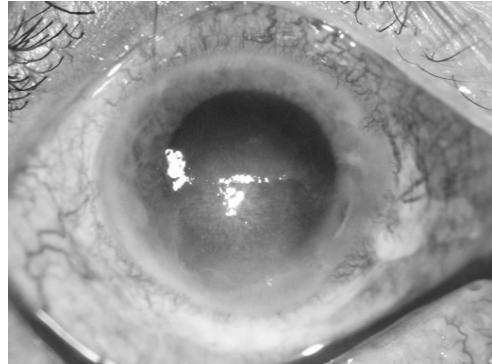


Image from <http://www.wikipedia.org/>

## Corneal Abrasion

- Treatment
  - Ciprofloxacin ophthalmic drops or ointment Q2-Q4H
  - Ophthalmic referral / follow-up (24 hrs)

## Chemical Injury

- Irrigation should be started before anything else (even vision or history)
  - Saline or LR
  - Tetracaine drop first, then eyelid speculum
  - Sweep upper and lower fornices

## **Chemical Injury**

- After 30 min, wait 5 min, then check pH if possible
- Repeat until pH is neutral (~7.0)

## **Chemical Injury**

- History
  - What substance(s) involved
  - Any treatment / irrigation at time of injury
  - Eye protection at time of injury
  - Wearing contact lens?

## **Chemical Injury**

- Exam findings range from mild injection, to severe injection, to a white eye.
- Epithelial defects vary with severity
- Eyelid swelling

## **Chemical Injury**

- Emergent same day ophthalmic evaluation

## Corneal / Conjunctival Foreign Bodies



Image from <http://www.wikipedia.org/>

## Corneal / Conjunctival Foreign Bodies

- History: determine mechanism of injury - determine risk of high risk projectile
- Vision - may need tetracaine first
- Limited exam until there is confirmation that there is no perforation

## Corneal / Conjunctival Foreign Bodies

- Foreign body sensation
- Tearing
- History of trauma or at risk activity
- Visualize FB, injection, chemosis

## Corneal / Conjunctival Foreign Bodies

- Treatment
  - Ophthalmic referral for removal and evaluation
  - Antibiotic (floroquinolone) drop Q2H until appointment

## Corneal / Conjunctival Foreign Bodies

- Signs of perforation
- Peaked pupil
- Blood (hyphema) or white cells (hypopyon) in the anterior chamber

## Hypopyon



Image from <http://www.wikipedia.org/>

## Peaked Pupil

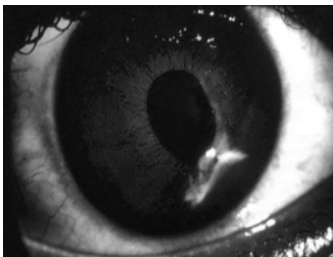


Image from <http://www.wikipedia.org/>

## Hyphema



Image from <http://www.wikipedia.org/>

## Hyphema

- Eye pain
- Blurred vision
- Photophobia
- History of blunt trauma

## Hyphema

- History - mechanism, eye protection, time of injury, time of vision loss / recovery
- Medication use (ASA, plavix, warfarin)
- History or family history of sickle cell

## Hyphema

- Typically visible without slit lamp
- Red or black in color
- May look like distorted pupil

## Hyphema

- Emergent referral for ophthalmic care
- Can result in very high eye pressure
- Proper treatment requires multiple topical and sometimes systemic therapy



## **Eyelid Laceration**



## **Eyelid Laceration**

- High velocity or high force mechanisms can also damage the globe, a complete eye exam is needed prior to repair
- This type of injury may also require brain and orbit imaging

## **Eyelid Laceration**

- Location and depth determine type of repair and need for further examination and imaging

## **Eyelid Laceration**

- All eyelid margin lacerations should be repaired by an ophthalmologist or oculo-plastic surgeon

## Prevention

- Proper eye protection can save a patient's sight
- Most home activities = "ANSI Z87.1"
  - American National Standards Institute
- Make eye protection a part of your standard accident prevention discussion!

## The Red Eye



Image from  
<http://www.wikipedia.org/>

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## Prevention



Image from <http://www.wikipedia.org/>

## Red Eye: Possible Causes

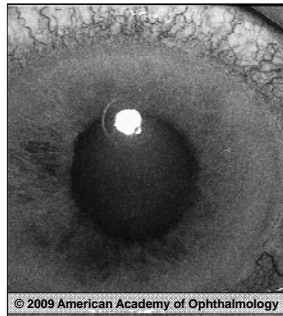
- Trauma
- Chemicals
- Infection
- Allergy
- Systemic Conditions
  - Stevens-Johnson Syndrome
  - Rheumatoid Arthritis
  - Sarcoid



Image from <http://www.wikipedia.org/>

## Referral Criteria

- Loss of Vision
- Pain
  - Especially when not relieved by topical anesthetics
- Corneal opacity
- Pupillary distortion
- Circumlimbal injection
- Intraocular inflammation
- Recent injury or surgery



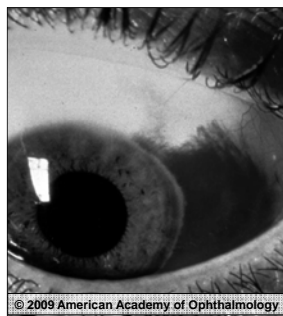
## Hordeolum

- Infection involving glands of Zeis (external or sty) or meibomian glands (internal)



## Red Eye Disorders: Non-Vision Threatening

- Hordeolum
- Chalazion
- Blepharitis
- Conjunctivitis
- Subconjunctival Hemorrhage
- Dry Eyes
- Episcleritis
- Corneal Abrasion



## Chalazion

- Chronic, lipogranulomatous inflammation of the Zeis or meibomian glands



## Hordeolum & Chalazion Treatment

- Goal
  - To promote drainage
- How
  - Acute/Sub-acute
    - Hot compresses
    - Topical antibiotics/ointments
    - Oral antibiotics
  - Chronic
    - Refer to ophthalmology (Possible I & D)

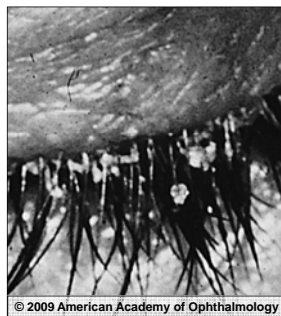
## Blepharitis Treatment

- Lid Hygiene
  - Hot compresses
  - Lid/lash cleansing with non-irritating shampoo
  - Antibiotic ointment (erythromycin) qhs for 2-3 weeks
  - Oral tetracycline or doxycycline
    - Reserved for refractory cases

If persists refer to Ophthalmologist

## Blepharitis

- A chronic inflammation of the lid margin
- Types
  - Staphylococcal
  - Seborrheic
    - May also be on scalp and eyebrows
  - A combination
- Symptoms
  - Foreign-body sensation
  - Burning
  - Mattering



## Conjunctivitis

- Inflammation of the conjunctiva
- Caused by bacteria, viruses, allergies, and tear deficiency
- Diffuse injection
- +/- Discharge



Image from <http://www.wikipedia.org/>

Discharge	Causes
Purulent	Bacteria
Stringy, white mucus	Allergies
Clear with preauricular lymphadenopathy	Viruses

## Conjunctivitis

- If It Burns – It's Dry
- If It Itches – It's Allergy
- If It's Sticky – It's Bacteria



Image from <http://www.wikipedia.org/>

## Conjunctivitis – Bacteria Treatment

- Mild purulent discharge and a clear cornea
  - Topical antibiotic drop for 5-7 days
  - Topical antibiotic ointment
- Follow-up after 2-4 days
- Refer if:
  - No improvement or worse
  - Decreased vision
  - Photophobia
  - Pain

## Conjunctivitis – Bacteria

- Purulent discharge
- No preauricular node
  - Except Chlamydia



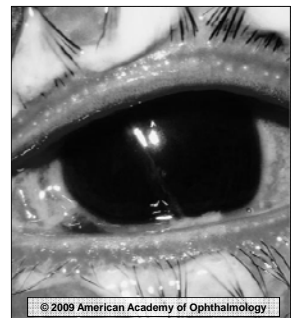
Image from <http://www.wikipedia.org/>

### CAUSES

Staph epi	H. flu
Staph aureus	Moraxella
Strep pneumo	Infant forms

## Conjunctivitis-Bacterial *Neisseria gonorrhoeae*

- Rapid onset
- Hyperpurulent
  - Frequent irrigation of conjunctiva
- Corneal infiltrates, melting, perforation
- Topical and systemic antibiotics
  - IV or IM ceftriaxone



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## Conjunctivitis - Allergic

- Stringy, white discharge
- No preauricular node
- Associated conditions
  - Hay fever, asthma, eczema
- Contact Allergy
  - Chemicals or Cosmetics
- Tx: Topical antihistamines, tears to relieve itching
- Refer Refractory Cases



Image from <http://www.wikipedia.org/>

## Conjunctivitis – Viral Treatment

- No specific tx
- Self-limited
- Cool compress
- Hand washing
- Isolation if work with public
- Resolves in 10-14 days
- Refer if pain, photophobia, or decreased vision



Image from <http://www.wikipedia.org/>

## Conjunctivitis - Viral

- Discharge
  - Serous or watery
- Preauricular node, URI, fever, sore throat
- Causes
  - Adenovirus #1
  - HSV, Varicella, CMV
  - MMR, EBV
  - Influenza A, Molluscum
  - Enterovirus, Coxsackievirus

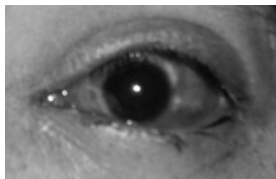


Image from <http://www.wikipedia.org/>

## Subconjunctival Hemorrhage

- Red eye, good vision, and no pain
- No treatment, just reassurance
- If first episode, coagulation studies not indicated



Image from <http://www.wikipedia.org/>

## Dry Eye Syndrome

- Associated conditions
  - Aging
  - RA, Sjogrens, SJS
  - Systemic Meds
- Symptoms
  - Burning
  - FB sensation
  - Reflex tearing
- Treatment
  - Artificial tears
  - Lubricating ointment
  - Punctal occlusion



## Red Eye Disorders Vision Threatening

- Orbital Cellulitis
- Scleritis
- Infectious Keratitis
- Iritis
- Acute Angle Closure Glaucoma
- Chemical Burn
- Hyphema
- Corneal or Conjunctival Foreign Body



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## Episcleritis

- Inflammation of episclera
  - Loose connective tissue b/w conj and sclera
- Associated redness and tenderness
- Etiology is often idiopathic
- Tx: Supportive



Image from <http://www.wikipedia.org/>

## Cellulitis

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Preorbital               <ul style="list-style-type: none"> <li>– Cellulitis of extraocular structure w/ tenderness, erythematous, and edema of lid</li> <li>– Normal vision, pupils, and motility</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Orbital               <ul style="list-style-type: none"> <li>– External redness and swelling</li> <li>– Impaired and painful ocular motility</li> <li>– <math>\pm</math> Proptosis</li> <li>– <math>\pm</math> Optic nerve pressure with decreased vision, APD, and disc edema</li> </ul> </li> </ul> |
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## Bacterial Keratitis

- Red, painful eye
- Purulent discharge
- Penlight exam may reveal opacity
- Decreased vision
- Emergency referral
- No topical anesthetics

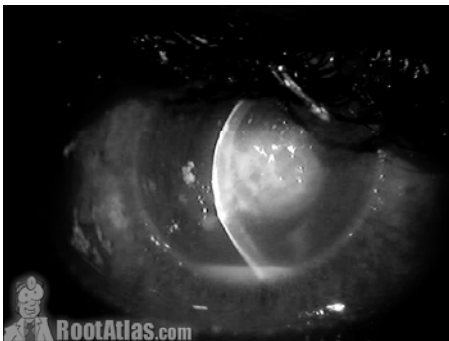


## Viral Keratitis

- Unilateral or bilateral blepharoconjunctivitis
- Watery discharge
- Skin vesicles (HSV)
- Enlarged preauricular lymph node
- Photophobia
- Decrease vision



## Contact Lens Associated Keratitis



## Viral Keratitis (HSV)

- Corneal involvement usually unilateral
- Red eye
- Foreign body sensation
- Tearing
- Refer if a dendrite is seen



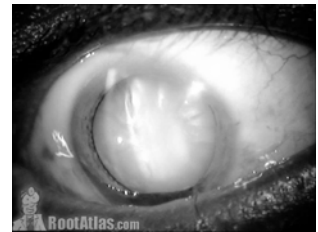
## Herpes Zoster Ophthalmicus

- 1<sup>st</sup> Division Trigeminal Nerve
  - V1
- Nasociliary branch involvement
  - tip of nose
  - increases likelihood of ocular disease



## Topical Steroid Side Effects

- Elevate IOP
  - Steroid-induced glaucoma
- Potentiate fungal corneal ulcer
- Cataracts
  - Long term use
- Can potentiate corneal perforation



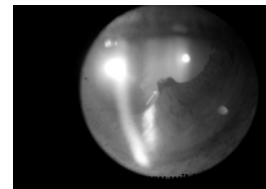
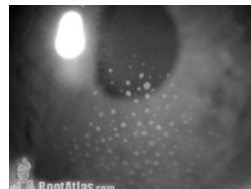
## Treatment for Viral Keratitis

- HSV- Topical antiviral
  - Consider PO antiviral agents
- HZV- PO antiviral agents
  - Consider topical antiviral if nose is involved
  - Possible steroids
- Misc Viral- Supportive
  - Artificial tears and ointment
  - Cool compresses



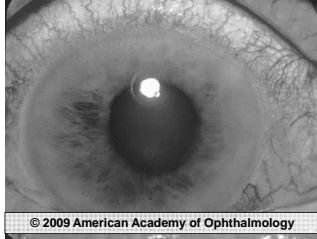
## Iritis

- Signs and Symptoms
  - Decreased vision
  - Pain and photophobia
  - Circumlimbal redness
  - Miotic pupil
- Rule Out
  - Trauma
  - Systemic inflammation
  - If Iritis is suspected – refer to Ophthalmology



## Acute Angle-Closure Glaucoma

- Characterized by a sudden rise in IOP in a susceptible individual with a dilated pupil
- Signs & Symptoms
  - Severe ocular pain
  - Frontal headache
  - Blurred vision
  - Halos around light
  - Nausea & vomiting
  - Fixed mid-dilated pupil
  - Firm globe



## Summary

- Red eyes are a common presentation to the primary care physician and treatment can be initiated for many of these disorders
- Avoid steroid drops and no Rx for topical anesthetic drops
- Handle recently traumatized eyes carefully
- Look for warning signs and symptoms of sight threatening conditions
- Know when to refer to ophthalmologist

## Acute Angle Closure Glaucoma Treatment

- Ophthalmology consult ASAP (for LPI)
- Topical beta-blocker q15min x 2
- Topical alpha-blocker q15min x 2
- Topical Steroid q15min x 4 then q1h
- $\pm$  Topical Pilocarpine 1-2%
- Diamox 500 mg PO bid, can use IV 1st
- IV Mannitol