No disclosures

Goals
- Review the anatomy of the eye
- Recognize common eye conditions and treatment
- Be able to diagnose the causes of a red eye
- Know when to refer a patient to an ophthalmologist and urgency
Review of Ocular Anatomy

Useful tools to aid in diagnosis: near vision card, penlight with blue filter, topical anesthetic, fluorescein strips.

Checking Vision in kids

- Available methods:
  - Snellen letters
  - Tumbling E
  - HOTV
  - Allen pictures
Symptoms can help determine the diagnosis

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching</td>
<td>allergy</td>
</tr>
<tr>
<td>Scratchiness/ burning</td>
<td>corneal disorders, including foreign body, trichiasis, dry eye</td>
</tr>
<tr>
<td>Localized lid/conjunctival discharge</td>
<td>Hordeolum, Chalazion</td>
</tr>
<tr>
<td>Deep, intense pain</td>
<td>Corneal abrasions, scleritis, iritis, acute glaucoma, sinusitis</td>
</tr>
<tr>
<td>Photophobia</td>
<td>Corneal abrasions, uto, acute glaucoma</td>
</tr>
<tr>
<td>Halo Vision</td>
<td>corneal edema (acute glaucoma, contact lens overwear)</td>
</tr>
</tbody>
</table>

Diagnostic steps to evaluate the patient with the red eye

- Check visual acuity
- Inspect pattern of redness
- Detect presence or absence of conjunctival discharge and categorize as to amount (scant or profuse) and character (purulent, mucopurulent, or serous)
- Inspect cornea for opacities or irregularities
- Stain cornea with fluorescein
Diagnostic steps continued

- Estimate depth of anterior chamber
- Look for irregularities in pupil size or reaction
- Look for proptosis (protrusion of the globe), lid malfunction, or limitations of eye movement

How to interpret findings

- Decreased visual acuity suggests a serious ocular disease. Not seen in simple conjunctivitis unless there is corneal involvement.
- Blurred vision that improves with blinking suggests discharge or mucus on the ocular surface
Common conditions to recognize and treat:

- Blepharitis
- Hordeolum/Chalazion
- Viral conjunctivitis
- Allergic conjunctivitis
- Dry Eyes

Blepharitis
- Chronic inflammation of the lid margin
- Types: staphylococcal or seborrheic
- Symptoms: foreign-body sensation, burning, mattering, itching, and tearing
- May predispose to chalazia, blepharoconjunctivitis, loss of lashes
- Common, more severe in elderly
**Blepharitis Treatment**

- Warm compresses
- Lid scrubs with nonirritating shampoo (dilute Johnson and Johnson’s baby shampoo) and water daily
- Antibiotic ointment at bedtime for 2-3 weeks (Bacitracin or erythromycin) if severe
- Resistant cases referred to the ophthalmologist

---

**Hordeolum/Chalazion**

- Usually begins as diffuse swelling followed by localization of a nodule to the lid margin
- Treatment includes warm compresses and topical antibiotic drops or ointment four times a day
- Can see preseptal cellulitis requiring oral antibiotics
Hordeolum/Chalazion Treatment Contd

- Lesions present for more than a month seldom resolve spontaneously and should be referred to an ophthalmologist on a non-urgent basis if no resolution with conservative management for incision and drainage.

Pinguecula and Pterygium

- Benign yellowish growth of the conjunctiva or fibrous growth onto the cornea.
- Related to UV damage, wind.
- Often inflammation can cause eye redness, dryness, tearing.
- Treat with sun and wind protection, artificial tears, lubricating ointments.
- May require removal if causing astigmatism or chronic inflammation.
Subconjunctival Hemorrhage

- Bleeding into the potential space between the conjunctiva and sclera
- May be due to trauma, associated with conjunctivitis, coughing, sneezing, spontaneous
- Usually resolves without sequelae and requires no treatment

Subconjunctival Hemorrhage

- If associated with trauma, inspect globe carefully to rule out other injuries
  - Corneal abrasions
  - Open globe (immediate referral)
  - Hyphema

 Conjunctivitis

- Nonspecific term for inflammation and erythema of the conjunctiva.
- Several causes: Bacterial, Viral, Allergic, chemical
- History is key to diagnosis:
  - Recent contact with someone with red eyes?
  - Has it spread from one eye to the other?
  - Any tearing or discharge?
  - Any change in vision?
  - Has it itched?
  - Has the child been rubbing their eyes?
Allergic Conjunctivitis
- Associated with hay fever, asthma, eczema
- Often bilateral and seasonal
- Milder conjunctival hyperemia
- Chemosis
- Itching (primary symptom), bilateral

Bacterial versus viral conjunctivitis
- Severe erythema of conjunctiva
- Purulent discharge
- May be monocular or bilateral
- Hemophilis may cause hemorrhage on the conjunctiva and occasionally the lids
  - Often bilateral
  - Often with diffuse, marked hyperemia
  - Watery discharge
  - Some itching and foreign body sensation
  - Preauricular adenopathy
  - URI, sore throat, fever common, recent sick contact

Bacterial conjunctivitis:
- Often Staphylococcus aureus, staph epidermis, strep pneumoniae, and H flu (children)
- Less itching and purulent discharge
- If severe, swab for cultures, gram stain for gonococcus
- Topical antibiotics (polytrim) for 5-7 days
Pediculosis
- Contact with pubic lice
- Itching and mild conjunctival injection
- Treatment is mechanical removal of lice, 
ointment, and antilice shampoo

Dry eye Syndrome
- Burning, dryness, 
fluctuation in vision, 
excess tearing
- Worse with use and 
later in day
- Bilateral and chronic
- Common in 
postmenopausal women

Refer in 1-2 days:
- Bacterial conjunctivitis (except due to 
gonorrhea)
- Corneal abrasions
- Preseptal cellulitis
- Herpetic conjunctivitis, keratitis
Corneal Abrasions

- Often a history of trauma or getting something in the eye (beware if contact lens wear)
- Application of fluorescein dye into the eye and viewing with a cobalt-blue light.
- Symptoms:
  - Pain, photophobia (light sensitivity), redness, tearing, blurred vision
  - Monocular

Small abrasions will heal within 24 hours, larger abrasions take longer
Prescribe topical antibiotic ointment (erythromycin) or drop (ofloxacin)
Patient should be followed daily or every other day until healed
May refer to ophthalmologist for the next day follow up
Look for corneal foreign body

Preseptal Cellulitis

- Infection of the eyelids and soft tissue structures anterior to the orbital septum
- May be due to skin infection, trauma, chalazion
**Slide 34**

**Preseptal Cellulitis**
- Mild to very severe eyelid edema
- Eyelid erythema
- Normal ocular motility
- Normal pupill exam
- Mild systemic signs (fever, preauricular and submandibular adenopathy)
- Treat with oral antibiotics—admit/IV antibiotics if young child

---

**Slide 35**

**Herpetic Eye Disease**
- Discharge, irritation, eyelid margin ulcers and vesicles (blisters on a red base)
- Corneal involvement may result in permanent scarring and visual loss
- High concern for ocular involvement of zoster if involving V1 (ophthalmic) or Hutchinson’s sign
- Urgent referral to ophthalmologist for treatment with topical or oral antivirals
Require same day referrals

- Chemical Injuries (irrigation started as soon as possible)
- Orbital cellulitis
- Iritis
- Corneal Ulcers
- Hyphema
- Acute angle closure glaucoma
- Open globe injury

Chemical Injury

- Range from mild inflammation to severe damage with loss of the eye
- Acid burns produce denaturation and coagulation of protein. Acid damage often limited by neutralization of the buffering action of the tissue
- Alkalines penetrate ocular tissues rapidly and produce intense widespread damage

Chemical Injury: Treatment

- The single most important step in management is complete and copious irrigation of the eye
- Treatment should be instituted within minutes
- A true ocular emergency!!!
- Instill a drop of topical anesthetic if available
- Use eye irrigation solutions or normal saline IV drip
- Oculist or ophthalmology consult
Orbital Cellulitis

- Infectious process posterior to the orbital septum that affects orbital contents
- Medical emergency !!!!
- Bacterial infection of the adjacent paranasal sinuses, particularly the ethmoids
- Infants may develop secondary to dacryocystitis (infection of the nasolacrimal system)

Orbital Cellulitis – Signs and Symptoms

- Redness and swelling of lids
- Impaired motility, often with pain on eye movement
- Proptosis
- Decreased vision
- Afferent pupillary defect
- Optic disc edema
Orbital Cellulitis Management
- Hospitalization
- Blood culture
- Orbital CT scan
- IV antibiotics
- If large fluid collection may require exploration and drainage

Iritis
- Inflammation of the anterior segment of the eye
- May be idiopathic, secondary to trauma, or associated with a systemic disease
- Presents with ciliary flush, photophobia (light sensitivity), pain, keratic precipitates
- Usually not associated with tearing or discharge
Slide 46

**Iritis - treatment**

- Steroids
- Cycloplegia – use of cycloplegic drop to dilate pupil. This will decrease movement of iris thus aiding with pain and help prevent scarring of iris to the lens (atropine 1% or cyclopentolate)
- Requires referral to ophthalmologist

Slide 47

**Corneal Ulcer**

- A localized infection of the cornea, high suspicion in contact lens wearers
- Usually bacterial, but may be fungal or protozoan (ameoba)
- Corneal cultures and gram stain prior to antibiotics if large or central
- If small and periphery, may start antibiotics and next day referral

Slide 48

**Hyphema**

- Accumulation of blood within the anterior chamber.
- Frequently is the result of blunt eye trauma.
- Intraocular pressure elevation common
Slide 49

Acute Angle Closure Glaucoma

- Try to compare the anterior chamber depth of the two eyes—a narrow anterior chamber suggests angle closure glaucoma.
- Unusual in children, increased risk with small eye, dense cataract, elderly.
- May present with nausea and vomiting, pain, eye redness, halos, blurred vision.
- Cloudy cornea and mid-dilated pupil.

Slide 50

Open Globe injury

- Do not apply pressure on the globe.
- Place shield over the eye.
- Update tetanus.
- Avoid vomiting, straining.
- IV antibiotics—cefazolin and moxifloxacin.
- CT scan to rule out fractures, f/h.

Slide 51

Questions?