The **Red Eye Express**

Charles L. Stockwell, O.D.
Therapeutic Optometrist and Glaucoma Specialist
Charles.Stockwell@ttuhsc.edu
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**A Puzzle With Pieces Linked**

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**Other Areas for the Chief Complaint for the Red Eye?**

- Chief Complaint (CC)
- History of Present Illness (HPI)
- Review of Systems (ROS)
- Past Family and Social History (PFSH)
- Medications

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**Chief Complaint and HPI**

- Reason for the Medical Encounter = Concise Statement
- Element/Explanation
- Location
- Duration
- Severity
- Quality
- Context on how Sx Began. CL Wearer?
- Modifying Factors
- Associated Sign and Symptoms
- Timing
Symptoms/Signs of Inflammatory Eye Disease

- One Eye or Both
- Contact Lens Wearer or Recent Surgery – Similar Episodes
- Onset – How Fast
- Any One Else with Symptoms – URI, Headaches
- Papillae – Folicles
- Redness – Heat, Fever
- Edema/Swelling – Lids or Conjunctiva or Cornea
- Pain – Pain with eye movement
- Bulging or protruding eye – Chemosis
- Dry, Burn, Sting, or Itchy eye
- Discharge and Type
- Lumps or nodules o/sides of the eyelid or skin or lymph-Glands
- Sensitivity or inability to tolerate bright light (photophobia)
- Uncoordinated, jerky, or restricted eye movements
- Vision changes
- Corneal involvement – infiltrates, ulcers
- Anterior Chamber – CIF
- Retinal or Vitreous Changes

Differential Diagnosis

Lid
- Blepharitis
- Marginal Keratitis
- Trichiasis – Entropion
- Ectropion
- Herpetic/Eye/Staphylococcus
- Canaliculus
- Dacryocystitis
- PeriOrbital and Orbital Cellulitis
- Ulcer Rosacea

Conjunctiva
- Dry Eye
- Pterygium
- Subconjunctival Hemorrhage
- Medication and Over Use
- Contact Lens – CLARE and CIE
- Bacterial including Chlamydia, Gonococcal
- Viral
- Episcleritis vs Scleritis

Cornea
- Bacterial Keratitis
- Herpetic Keratitis
- Fungal Keratitis
- Acanthameba Keratitis

Anterior Chamber
- Anterior Uveitis / Iritis
- Endophthalmitis

Other
- Chemical
- Trauma
- Acute Angle Closure Glaucoma
- Neovascular Glaucoma

Patterns of Redness

- Lids
- Inter Palpebral
- Sector
- Diffuse
- Perilimbal or Circumcorneal (Sparing or Injection)
- Superficial with movement of Conjunctiva
- Deep Vessels
Discharge
- Watery – Viral
- Membranous - Viral
- Stringy - Allergic
- Crusty or flakey - Blepharitis
- Sticky and Crusty – Chlamydial
- Muco Purulent - Bacterial
- Profuse Purulent – Gonococcal

Pain
- None
- Itchy - Allergic
- Burn, Sting, Gritty - Dry
- Foreign Body
- Mild – Viral, Bacterial
- Intense Superficial – Acanthomeba
- Intense Deep Ache – Glaucoma, Iritis, Endophthomitis

External/Eyelid
- Blepharitis
- Entropian
- Ectropian
- Hordeolum or Stye
- Chalazion
- Dacryocystitis
- Peri Orbital and Orbital Cellulitis
- Ocular Rosacea
- Trauma

Eyelids Inflammation
- Blepharitis
  Anterior – Lashes
    Staphylococcal
    Seborregic
  Posterior – MGD
  Angular
  Demodex
- Symptoms
  Lid Crusting – FBS
  Itching
  Redness
- Treatment
  Lid Hygiene – WC-LS
  Antibiotics / Steroids
  Oral Antibiotics - Doxycycline
Anterior Blepharitis - Staph

- Lashes
- Telangiectasia
- Collarettes
- Scales
- Discharge
- Not Chronic
- Papilla
- Pannus/SEI
- Steroid/Antibiotic
- PO Antibiotics

Posterior Blepharitis - MGD
Seborrheic

- Dermatological
- Crusting
- Oily Margins
- Lid Redness
- Papilla/Follicles
- Dermatitis
- Dry Eye TX
- Steroid/Antibiotic

Anterior and Posterior Blepharitis

Clogged Meibomian Glands
Canaliculitis Infection/Viral

- Actinomyces
- HSV, Fungal
- Remove Obstruction
- Tx:
  - Penicillin Solution
  - Nystatin

Dacryocystitis

- Pain
- Redness
- Swelling
- Discharge
- Fever
- Tx:
  - Hot Compress
  - Antibiotic PO
  - Aspirate – Do Not I and D
  - Dacryocystorhinostomy – New Duct

Periorbital Cellulitis / Pre Septal Cellulitis vrs

Orbital Cellulitis / Post Septal Cellulitis
Chandlers's Classification

I. Inflammatory Edema (Preseptal)
   Lid Edema, no limitation of ocular movement or Vision Change

II. Orbital Cellulitis (Postseptal)
   Diffuse Orbital Infection and Inflammation without abscess

III. Subperiosteal Abscess
   Collection of pus between medial periosteum and lamina papyracea, impaired extraocular movement

IV. Orbital Abscess
   Collection of pus in orbital tissues, proptosis and chemosis with ophthalmoplegia and decreased vision.

V. Cavernous Sinus Thrombosis
   Bilateral eye findings and worsening of all other previous findings.

Peri orbital Cellulitis

- Some Mild Pain
- No Pain on Eye Movement
- Chemosis - Possible Mild
- Eye Lid Redness
- No Vision Loss

Orbital Cellulitis - Complications

- Swelling of Lids
- Chemosis
- Proptosis
- Pain on Movement of Eye
- Restricted/No movement
- RAPD
- IOP increase
- Fever
- Vision Loss
- Hx Sinusitis
- Cavernous Sinus Thrombosis
- Cerebral Abscess
- Retinal Vein Congestion
- CRAO
- Papillitis/Papilloedema
Ocular Rosacea

- The term “rosacea” is often associated with a chronic skin condition which results in redness.
- Ocular rosacea is a connected condition wherein the eye becomes red and inflamed.
- In part, the cause may be hereditary. There have also been findings to suggest bacteria, blocked glands in the eyelids, and environmental factors cause facial and ocular rosacea.
- With ocular rosacea the blood vessels in your eyes are dilated and become more visible. The condition can also cause eyes to feel dry and itchy. Stinging and burning in the eyes is common. Blurred vision is also reported. Swelling of the Eyelids can also be present.
- Associated with Demodex Mite.
Conjunctiva

- Ocular Rosacea
- Check Eyelids
  - Red
  - Swollen
  - Marginal Keratitis
  - Blepharitis
- SEI in Cornea
- Pannus
- Dry Eye Tx
- Avoid Spicy Foods

Dry Eye/Ocular Surface Disease

- MGD
- Sjogerns
- Allergic Conjunctivitis
- Graph vrs Host
- SJS/TEN
- OCP
DRY EYE

• Burn
• Sting
• Something in Eye, Foreign body
• Dry, Gritty, Sandy, or filmy feeling
• Poor Vision
• Eyes Water
• Light Sensitivity
• Redness to Eyes

Sjogrens Syndrome

• Inflammation of Glands of the Body
• Lacrimal
• Dryness
• Tx: Dry Eye
• Scleral Lenses

Dry Eye

<table>
<thead>
<tr>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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</table>

• Inferior Staining – if under the upper lid Change Your Thinking

Filamentary Keratitis

• Aqueous tear deficiency as in keratoconjunctivitis sicca
• Corneal exposure (e.g. seventh nerve palsy)
• Occlusion abnormalities such as blepharoptosis
• Ocular surgery (e.g. keratoplasty)
• Systemic diseases with effects on the ocular surface (e.g. Sjogren's syndrome)
• Extended use of anticholinergic medications
• Other ocular surface abnormalities.
• Recurrent.
Ocular Graph versus Host Disease

- Stem Cell Transplant – Allogenic Bone Marrow
- Keratoconjunctivitis Sicca
- Cicatrical Lagophthalmos
- Conjunctivitis
- Corneal Ulceration, Melt, Perforation
- Uveitis
- Ectropion
- Cataract
- Tx Dry Eye
- Scleral Lenses

Stevens Johnson Syndrome/TEN

- Toxic Epidermal Necrosis (TEN)
- Inflammatory - Dermatologic Skin and Mucous
- Life-threatening Blistering and Necrosis
- Extensive wound care, pain management, fluid and nutrition resuscitation, and respiratory support
- Mucopurulent Conjunctivitis
- Severe Dry Eye
- Episcleritis
- Scarring, Neovascularization
- Ankyloblepharon
Ocular Cicatricial Pemphigoid

- Mucous Membrane Pemphigoid Subtype – MMP’s
- Autoimmune Conjunctivitis
- High Risk – Ocular
- Clinical Signs
- Biopsy
- Cicatization
- Bullae
- TX:
  - Dapzone, Steroids
  - IV Immunglobulin
  - Infliximab

Benign Causes of Red Eye

- Subconjunctival Hemorrhage
- Pinguela
- Pterygium
- Eye Drops or Medication Over Use
- Cluster Headaches
- Contact Lens Wear

Ocular Cicatricial Pemphigoid

- Foster’s Classification System
- Stage I – Subconjunctival Fibrosis
- Stage II – Forniceal Shortening
- Stage III – Symblepharon
- Stage IV – Keratinization of the Ocular Surface, Ankyloblepharon

KProz thru Lid
Medication Medicamentosa/Reactions

• Dry Eye
• Conjunctival Irritation
• Limbal Irritation
• Corneal Haze
• Corneal melt
Cluster Headaches

Contact Lens Wear

• CLARE
• CIE
• GPC
• Ulcer

Contact Lens Acute Red Eye

• Inflammatory Reaction SCL Overnight Wear.
• Sudden Onset
• Unilateral Eye Pain
• Photophobia
• Diffuse Conjunctival and Limbal Hyperemia
• Check Cornea
  • Edema
  • CIE
  • Epithelial Defect
• Check Anterior Chamber
  Any Cells or Flare
• D/C Contacts
• Appropriate Tx

Corneal Infiltrative Event

• Inflammatory Response WBC
• Contact Lenses?
• Solutions or drops?
• Eye Lids - Blep?
• Allergic, EKC
• Autoimmune
Conjunctivitis
Bacterial versus Viral

- One simple rule is:
  that acute bacterial conjunctivitis presents as papillae,
  viral conjunctivitis as follicular, and
  chlamydial conjunctivitis as both.
- Viral conjunctivitis also displays watery ocular discharge that doesn't mat the lids together, and a palpable pretragal or preauricular node is usually present.

Papillary Versus Follicular Conjunctivitis

- **Papillary = Papillae**
  - Allergic and Bacterial
  - Cobblestone with central vascular cores
  - Red at surface and pale at base
  - Superior Tarsal, or Limbal Trantas Dots

- **Follicular = Follicles**
  - Allergic, Chlamydial, Viral, Toxic, Medications
  - Small dome shaped without central vessels
  - Pale on surface and red at base
  - Inferior Palpebral and Forniceal
Antibiotics for Bacterial Conjunctivitis

Aminoglycosides
• Gentamycin
• TobiAmcin
Polymerin B Combinations
• Bacitracin
• Polytrim
Macrolides
• Azale
• Erythromycin
Fluoroquinolones
• Biltracin
• Clisan
• Zymarit
• Levaquin
• Vigamox
• Ocuflox

Conjunctivitis- Acute

• Direct Contact
• Self Limiting
• Redness
• Limbal Sparing
• Sub Acute Onset
• Bilateral
• Mucopurulent
• Gritty
• Burning
• Papillae
• No Photophobia
• Fluoroquinolones, Polytrim

Chlamydial Conjunctivitis - Follicular

• Veneral
• Chronic with Mild Keratitis
• Usually Unilateral
• FB Sensation
• Lid Crusting and Sticky
• Follicles
• No Response to Antibiotics
• Preauricular Lymph Nodes
• Azithromycin, Doxy, Emycin
Gonococcal Conjunctivitis

- Veneral
- Acute Onset
- Copious Purulent
- Chemosis
- Diffuse Extreme Redness
- Lymphadenopathy
- Keratitis – Risk Corneal Perforation
- Culture
- Topical, IV, PO Antibiotics
- Check for other STD’s

Viral Conjunctivitis

- Adenoviral 7 - 7 - 7
- Acute Onset
- Bilateral
- Watery
- FB Sensation
- No Photophobia
- Follicular
- Hx of URTI
- Supportive or Betadine, Steroids later
Allergic Conjunctivitis

- 75% Atopy – Genetic Immune Response
- Itch
- White, Stringy, Ropy
- Chemosis
- Papillae and Follicular
Topical’s for Allergic Conjunctivitis

- Antihistamines
  - Lastacaft
- Mast Cell Stabilizers
  - Opticrom (Cromolyn Sodium), Alomide, Alamast
- Antihistamine/Mast Cell Stabilizers
  - Olopatadine – Patanol, Pataday, Pazeo
  - Azelastine, Alaway/Zaditor (Ketotifen), Elestat (Epinastine)
- Antihistamine/Decongestant
  - Naphcon-A, Opocon-A, Visine-A
- Steroids
  - Dexamethasone, Lotemax, FML, Prednisolone

GPC

- SCL
- Allergic
- Papillary
- Itch
- Tx: Remove SCL
- Mast Cell Steroids

VKC – Vernal Keratoconjunctivitis

- Allergic
- Inflammatory
- Tarsal, Limbal (Trantas), Mixed
- Seasonal or Chronic
- Papillary
- Recurrent
- Tx: Avoidance
- Steroids
- Mast Cell
- Restasis

AKC – Atopic Keratoconjunctivitis

- Allergic, Genetic Predisposition
- Dermatitis, Eczema
- Red
- Chemosis
- Pannus
- Papillary
- Trantas
- Tx: Steroid
- Mast Cell
- Restasis
- Blepharitis
- Dry Eye
Phlyctenular – TB Staph allergic

- Allergic
- Pain
- Photophobia
- Limbal Nodular Lesions
- TB, Chlamydia, HSV
- Staph, Strep
- Tx:
  - Steroids
  - Mast Cell
  - Restasis
  - Doxy PO

SLK – Superior Limbic Keratitis

- Not Allergic
- Lid Laxity and rubbing
- Itching
- Thyroid
- Dry Eye
- TX:
  - SCL
  - Topical Vit A
  - Autologous Serum
  - Mast Cell inhibitors
  - Amniotic Membrane

Inflammatory/Other Disease Associations

Conjunctiva
- Episcleritis - SJS/TEN
- Scleritis

Anterior Chamber
- Uvietis
  - Anterior
  - Intermediate
  - Posterior
Episcleritis

- 2.5% Neo-Synephrine to Blanch
- Mild tearing
- No Tenderness
- Sector Redness
- No Blur
- OCP/TEN
- Artificial Tears
- NSAID's
- Steroids

Scleritis

- Infectious, Auto Immune
- Pain – Severe
- Tenderness
- Scleral Edema
- Anterior and Posterior
- Nodular, Diffuse, Necrotizing
- Visual Blur
- Uveitis
- Oral Steroids, Antibiotics

Corneal

- Abrasion
- Bacterial Keratitis
- Herpetic Keratitis
- Fungal Keratitis
- Acanthameoba Keratitis

Abrasion

- How it Happened?
- What did it?
- Seidel Negative
- Recurrent
- Bandage SCL
- Antibiotic/Steroid
Bacterial Keratitis

- Red Eye
- Ocular Pain - FB
- Purulent
- Decreased VA
- Photophobia
- Ulcer
- Edema
- Hypopyon
- Fortified +/- Antibiotics

Herpetic Eye

- Pain – One Eye
- Vesicular Facial Lesions
- Headache and fever.
- Lid Edema
- Watery
- Redness, rash, or sores on the eyelids and around the eyes, especially on the forehead.
- Redness of Eye.
- Blurry vision.
- Photophobia.
- Acyclovir, Zirgan, Viroptic

Herpes Simplex Virus
HSV Classification

- Epithelial Keratitis: Dendritic, Geographical
  Oral or Topical Antiviral
- Stromal Keratitis: Interstitial Keratitis
  Steroid and Oral Profo
- Stromal K w Ulcer: Necrotizing Keratitis
  Oral Tx and Steroid
- Endothelial Keratitis: Disciform Keratitis
  Oral Tx and Steroid

Herpes Zoster Virus
HZV

Fungal Keratitis
- High Risk – Plant Matter
- Red Eye
- Corneal Lesion – Grey
- Feathery Margins
- Pain
- Blurry Vision
- Discharge and watery
- Photophobia
- Multiple Satellite Foci
- Epithelium Over is Intact
- Amphotericin-B, Anti Fungal

Acanthamoeba Keratitis
- Contact Lenses and/or Lake Swimming
- Severe Pain
- Less Corneal and Anterior Inflammation than expected
- Red
- Photophobia
- Epi and Sub Epi Infiltrates
- Pseudo Dendrites
- Ring Shaped - Stromal
- Negative Cultures
- Lack of response to Meds
- Aggressive Long Term Meds
Anterior Chamber
Uveitis

- Unilateral
- Pain (ache)
- Blurred VA
- Photophobia
- Red Eye PeriLimbal
- Hazy AC – KP Deposits – C/JF
- Constricted Pupil – Synachiae
- Labs – ESR, HLA-27, RBS, VRDL, Chest X-Ray
- Tx: Steroid/Cyclopentolate/Atropine and Find the Cause

Endophthalmitis

- Pain
- Redness
- Blurry VA
- From Surgery
- Penetrating FB
- Blood Supply
- Corneal Ulcer
- Allergy
- Inter Ocular Injection: Antibiotics, and Steroids.

Panophthalmitis

Other

- Chemical
- Trauma
- Acute Angle Closure
- Neovascular Glaucoma
Chemical Burns

Alkali Burns
- Liquefactive necrosis
- Continue to penetrate cornea long after exposure
- Eg. Ammonia, lye, lime

Acid Burns
- Coagulative necrosis
- Typically confined to superficial tissue
- Eg. Exploding car batteries (sulfuric acid), lab chemicals

ROPER HALL CLASSIFICATION

<table>
<thead>
<tr>
<th>Grade</th>
<th>Prognosis</th>
<th>Limbal ischemia</th>
<th>Corneal involvement</th>
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<tbody>
<tr>
<td>I</td>
<td>Good</td>
<td>None</td>
<td>Epithelial damage</td>
</tr>
<tr>
<td>II</td>
<td>Good</td>
<td>&lt;1/3</td>
<td>Haze, but iris details visible</td>
</tr>
<tr>
<td>III</td>
<td>Guarded</td>
<td>1/3 to 1/2</td>
<td>Total epithelial loss with haze that obscures iris details</td>
</tr>
<tr>
<td>IV</td>
<td>Poor</td>
<td>&gt;1/2</td>
<td>Cornea opaque with iris and pupil obscured</td>
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B. Cultures plus Keratoplasty

Before Treatment

After Treatment

6yr

4yr

4yr

4yr

Traumatic causes of Eye Inflammation
Glaucoma

- Closed angle PI
- Diamox
- Beta Blocker Timolol
- Neovascular PRP Anti-VEGF
- Surgery