

# The Red Eye Express

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No Financial Disclosures

## A Puzzle With Pieces Linked



### 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

### 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 – URTI - Headaches
- Papillae – Follicles
- 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 or Vesicles 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 C/F
- Retinal or Vitreous Changes

## Differential Diagnosis

- |  |  |
|--|--|
| <p><b>Lid</b></p> <ul style="list-style-type: none"> <li>- Blepharitis</li> <li>- Marginal Keratitis</li> <li>- Trichiasis – Entropion</li> <li>- Ectropion</li> <li>- Hordeolum/Stye/Chalazion</li> <li>- Canaliculitis</li> <li>- Dacrocystitis</li> <li>- Peri Orbital and Orbital Cellulitis</li> <li>- Ocular Rosacea</li> </ul> <p><b>Conjunctiva</b></p> <ul style="list-style-type: none"> <li>- Dry Eye</li> <li>- Pinguela</li> <li>- Pterygium</li> <li>- Subconjunctival Hemorrhage</li> <li>- Medication and Over Use</li> <li>- Contact Lens - CLARE and CIE</li> <li>- Bacterial including Chlamydia, Gonococcal</li> <li>- Viral</li> <li>- Allergic – GPC – VKC – AKC- PKC - SJS/TEN - OCP</li> <li>- Episcleritis vrs Scleritis</li> </ul> | <p><b>Cornea</b></p> <ul style="list-style-type: none"> <li>- Bacterial Keratitis</li> <li>- Herpetic Keratitis</li> <li>- Fungal Keratitis</li> <li>- Acanthamoeba Keratitis</li> </ul> <p><b>Anterior Chamber</b></p> <ul style="list-style-type: none"> <li>- Anterior Uveitis/Iritis vrs Vitritis</li> <li>- Endophthalmitis</li> </ul> <p><b>Other</b></p> <ul style="list-style-type: none"> <li>- Chemical</li> <li>- Trauma</li> <li>- Acute Angle Closure Glaucoma</li> <li>- Neovascular Glaucoma</li> </ul> |
|--|--|



## Patterns of Redness

- Lids
- Inter Palpebral
- Sector
- Diffuse
- Perilimbal or Circumcorneal (Spring 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 – Acanthameba
- Intense Deep Ache – Glaucoma, Iritis, Endophthomitis

## External/Eyelid

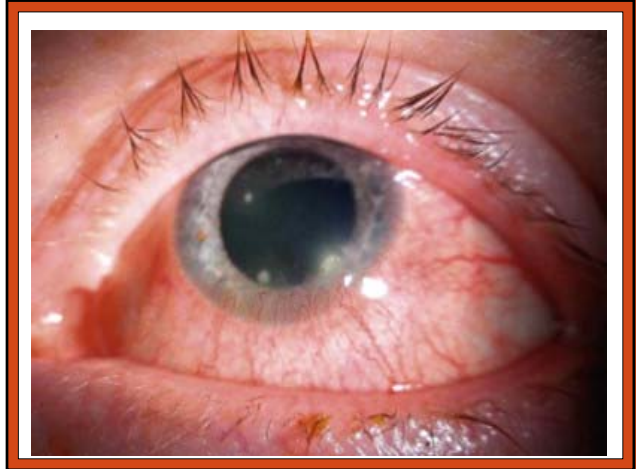
- Blepharitis
- Entropion
- Ectropion
- Hordeolum or Stye
- Chalazion
- Dacryocystitis
- Peri Orbital and Orbital Cellulitis
- Ocular Rosacea
- Trauma

## Eyelids Inflammation

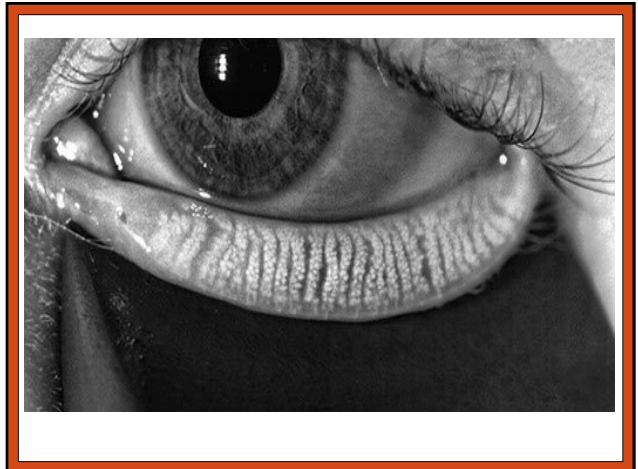
- Blepharitis
  - Anterior – Lashes
    - Staphylococcal
    - Seborregic
  - Posterior – MGD
  - Angular
  - Demodex
- Symptoms
  - Lid Crusting – FBS
  - Itching
  - Redness
- Treatment
  - Lid Hygiene – WC-LS
  - Antibiotics / Steroids
  - Oral Antibotics - Doxycyline

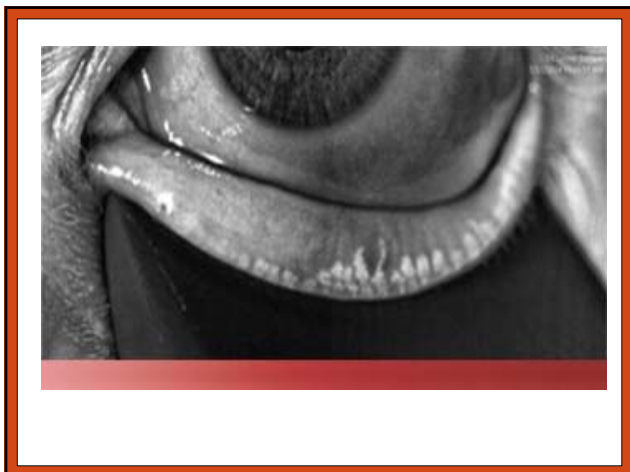
## Anterior Blepharitis - Staph

- 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

A close-up photograph of the eyelid margin showing seborrheic blepharitis, characterized by crusting and redness.

### Anterior and Posterior Blepharitis

A close-up photograph of the eyelid margin showing clogged Meibomian glands, indicated by arrows.

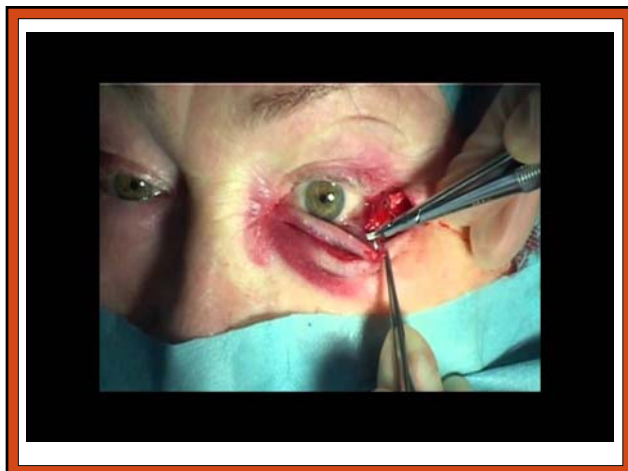
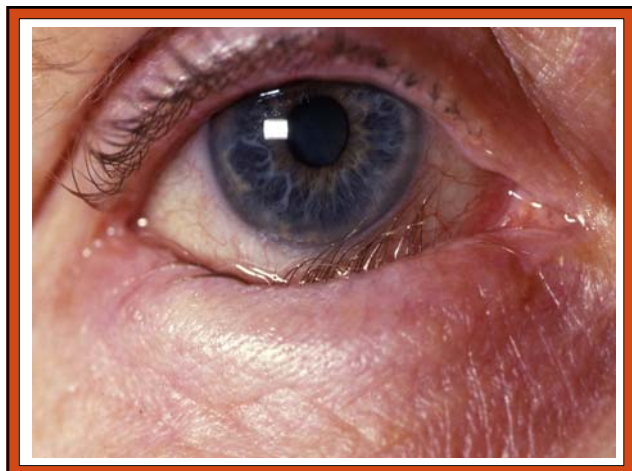
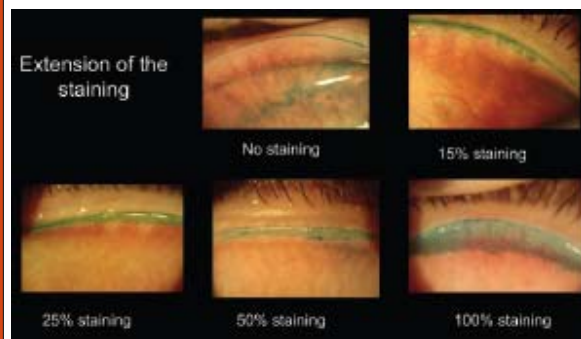
Clogged Meibomian Glands

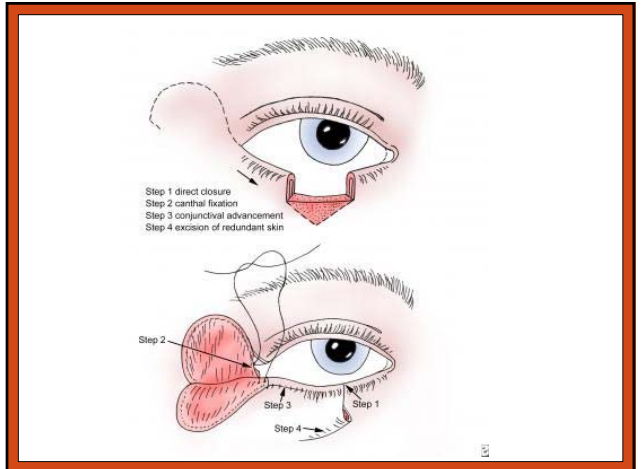
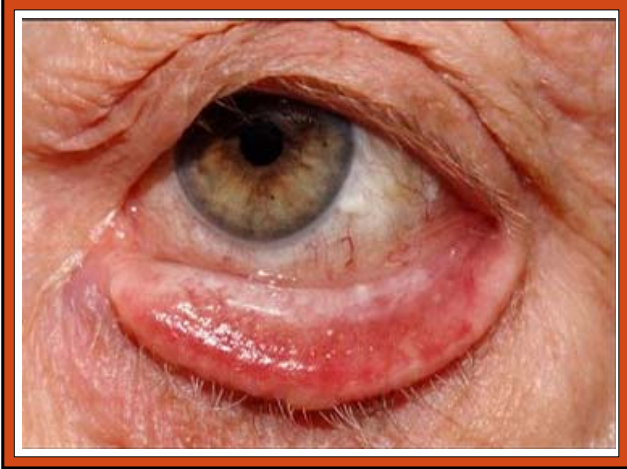


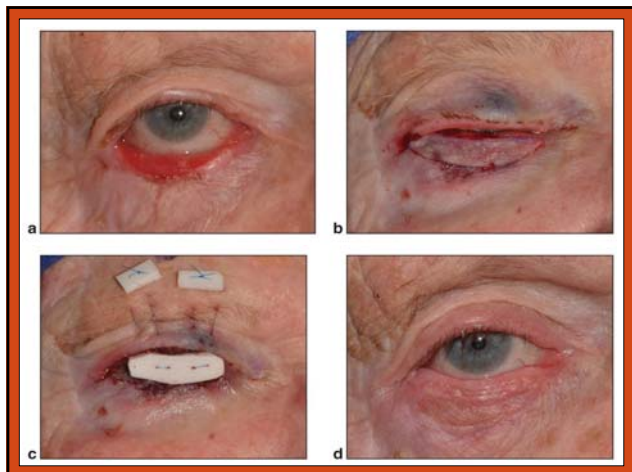
### Demodex Mite



### Lid Wiper Epitheliopathy











### 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.

### Periorbital Cellulitis

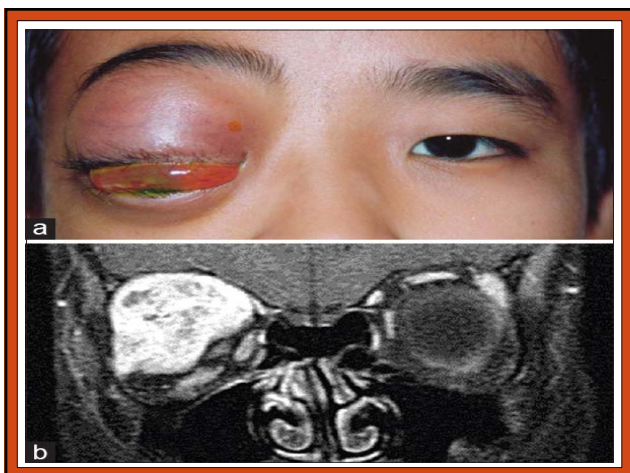
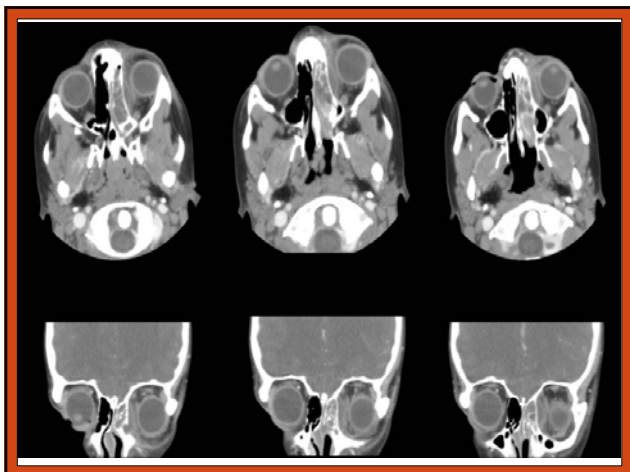
- Some Mild Pain
- No Pain on Eye Movement
- Chemosis -Possible Mild
- Eye Lid Redness
- No Vision Loss



### 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.



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

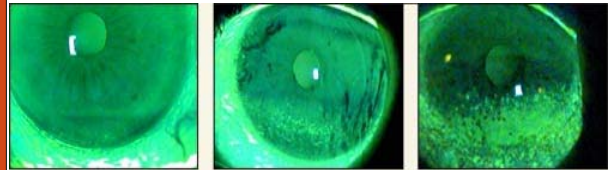
Conjunctiva

- 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

## Dry Eye

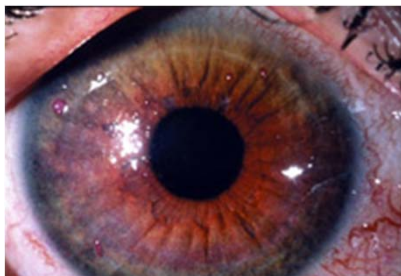


Mild Moderate Severe

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

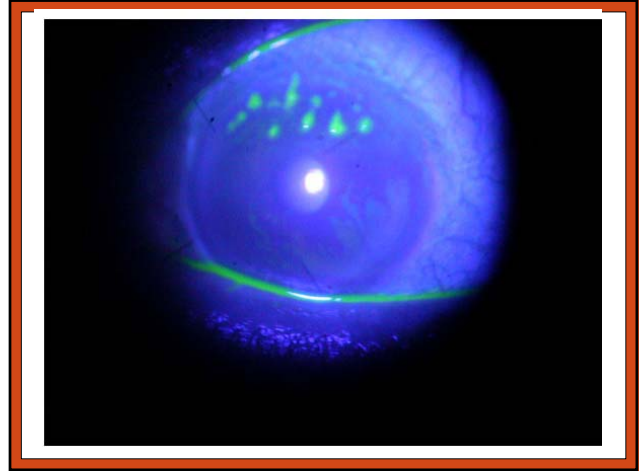
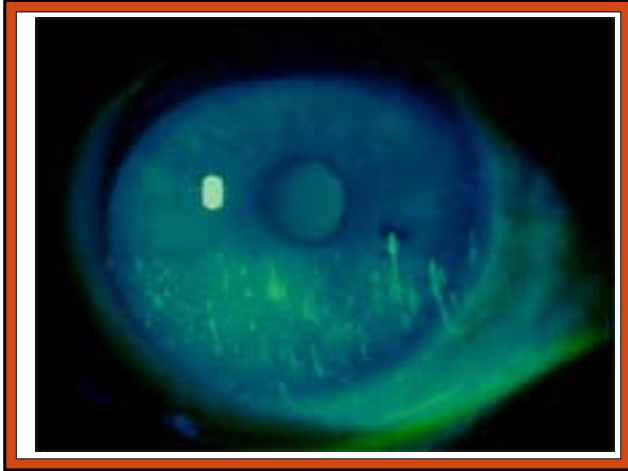
## Sjogrens Syndrome

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



## 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 Graft versus Host Disease

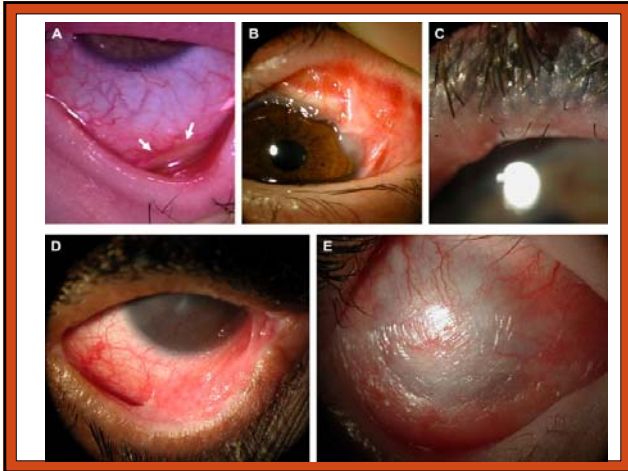
- Stem Cell Transplant – Allogenic Bone Marrow
- Keratoconjunctivitis Sicca
- Cicatricial Lagophthalmos
- Conjunctivitis
- Corneal Ulceration, Melt, Perforation
- Uveitis
- Ectropion
- Cataract
- Tx Dry Eye
- Scleral Lenses



### 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
- Cicatrization
- Bullae
- TX:
  - Dapzone, Steroids
  - IV Immuglobulin
  - Infliximab



### Ocular Cicatricial Pemphigoid

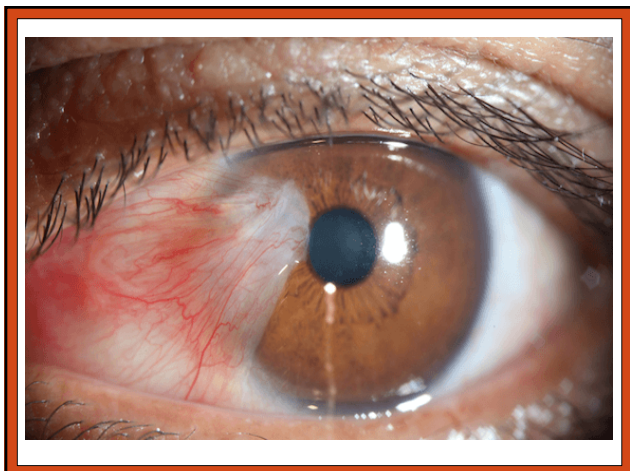
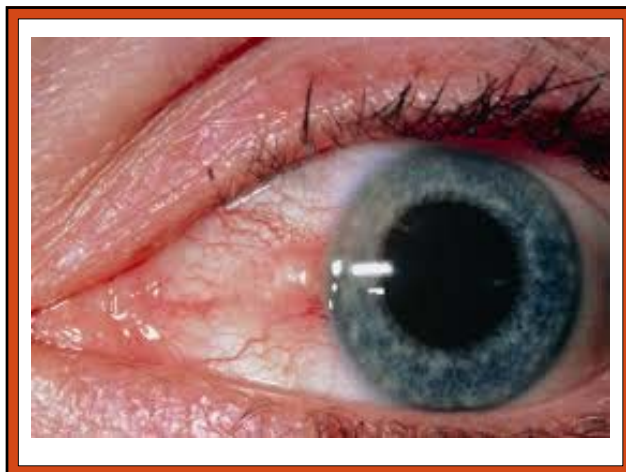
- Foster's Classification System
- Stage I - Subconjunctival Fibrosis
- Stage II – Forniceal Shortening
- Stage III – Symblepharon
- Stage IV – Keratinization of the Ocular Surface, Ankylobepharon

KPro2 thru Lid



### Benign Causes of Red Eye

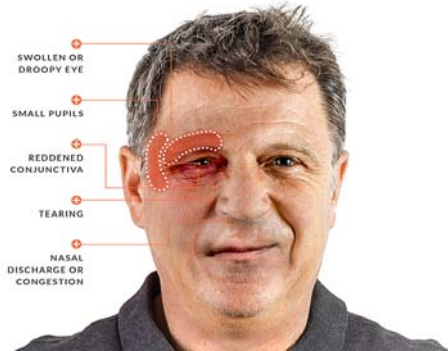
- Subconjunctival Hemorrhage
- Pinguela
- Ptygerium
- Eye Drops or Medication Over Use
- Cluster Headaches
- Contact Lens Wear



- Medication  
Medicamentosa/Reactions
- Dry Eye
  - Conjunctival Irritation
  - Limbal Irritation
  - Corneal Haze
  - Corneal melt



### Cluster Headaches



### Contact Lens Wear

- CLARE
- CIE
- GPC
- Ulcer

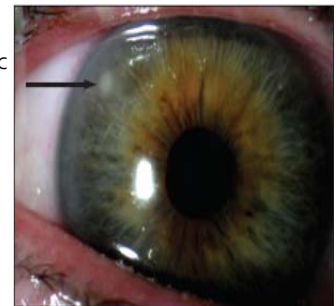
### Contact Lens Acute Red Eye

- 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 -
  - Tobramycin -
- Polymyxin B Combinations
  - Bacitracin +
  - Polytrim +-
- Macrolides
  - Azasite +
  - Erythromycin +
- Fluoroquinolones
  - Besivance +-
  - Ciloxan +-
  - Zymaxid +-
  - 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

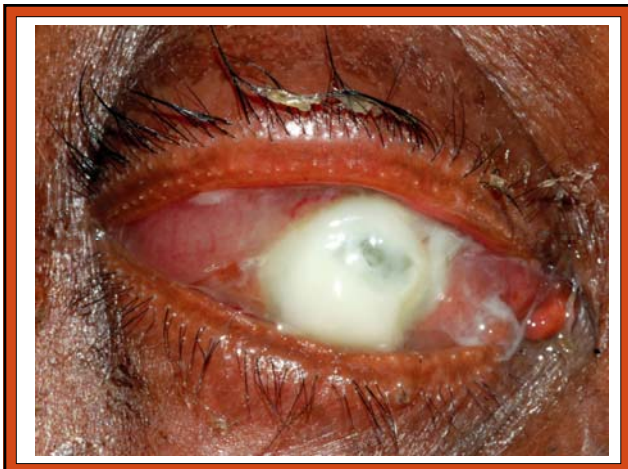
- Venereal
- Chronic with Mild Keratitis
- Usually Unilateral
- FB Sensation
- Lid Crusting and Sticky
- Follicles
- No Response to Antibiotics
- Preauricular Lymph Nodes
- Azithromycin, Doxy, Emycin





## Gonococcal Conjunctivitis

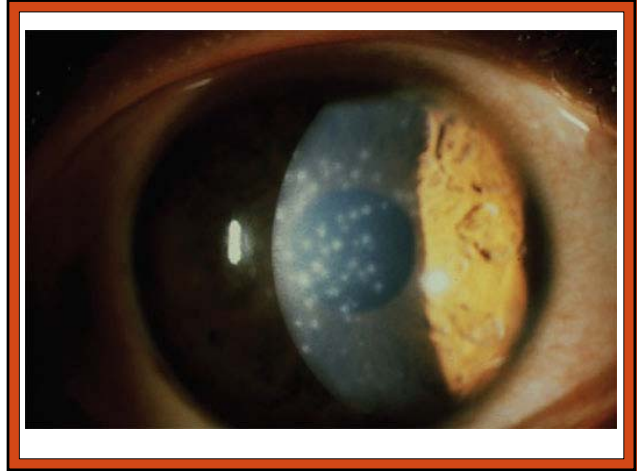
- Veneral
- Acute Onset
- Copious Purulent
- Chemosis
- Diffuse Extreme Redness
- Lymphadenopathy
- Keratitis – Risk Corneal Perforation
- Culture
- Topical, IV, PO Antibiotics
- Check for other STD's



## 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, Opcon-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



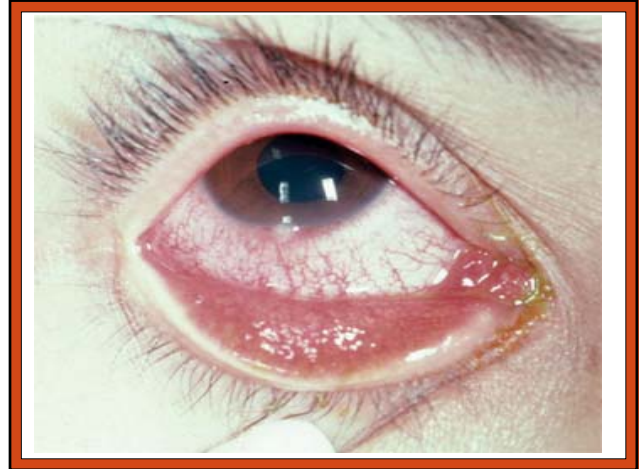
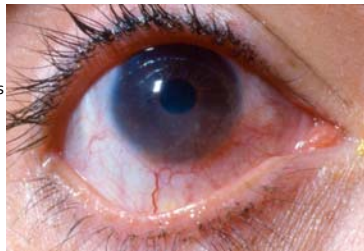
### AKC – Atopic Keratoconjunctivitis

- 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

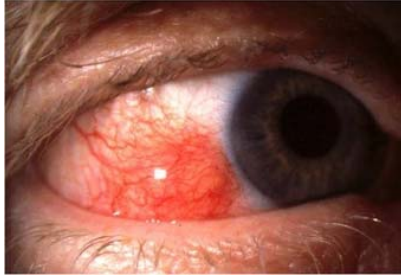
- Episcleritis - SJS/TEN
- Scleritis

#### Anterior Chamber

- Uveitis
  - Anterior
  - Intermediate
  - Posterior

## Episcleritis

- 2.5% Neo-Syneprine 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

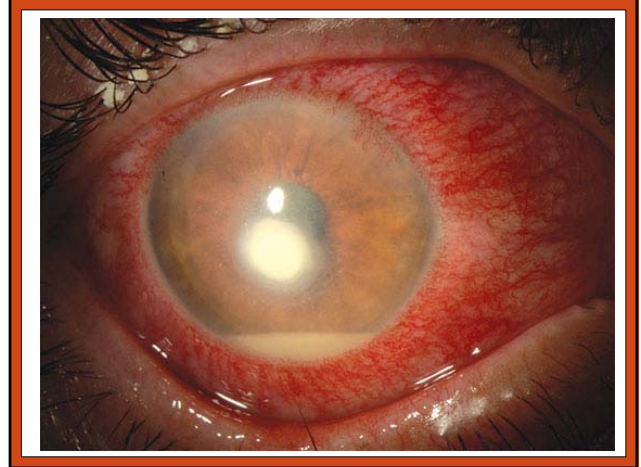
- How it Happened?
- What did it?
- Seidel Negative
- Recurrent
- Bandage SCL
- Antibiotic/Steroid





## Bacterial Keratitis

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



## Herpetic Eye

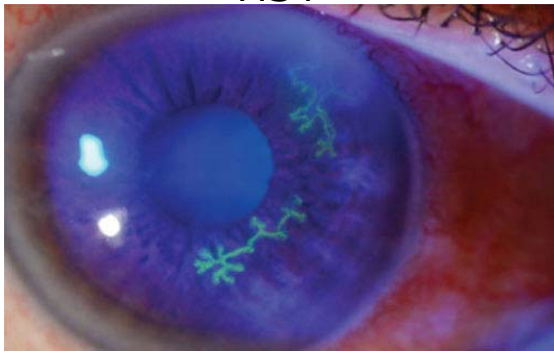
- Pain – One Eye
- Vesicular Facial Lesions
- Headache and fever.
- Lid Edema
- Watery
- Redness, rash, or sores on the eyelids and around the eyes, especially on the forehead.
- Redness of Eye.
- Blurry vision.
- Photophobia.
- Acyclovir, Zirgan, Viroptic



## Herpes Simplex Virus

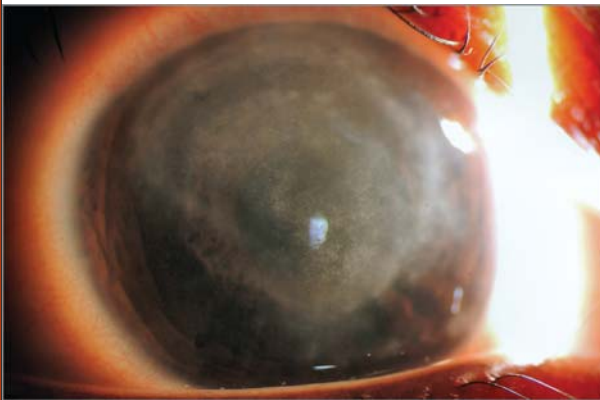


## HSV



## HSV Classification

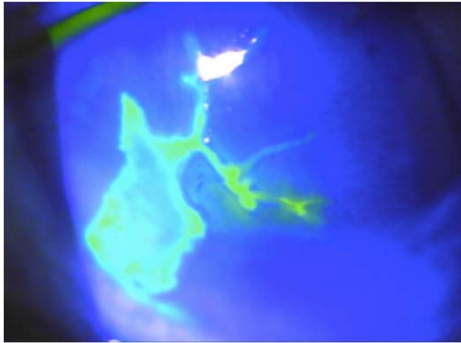
- Epithelial Keratitis Dendritic, Geographical  
Oral or Topical Antiviral
- Stromal Keratitis Interstitial Keratitis  
Steroid and Oral Profo
- Stromal K w Ulcer Necrotizing Keratitis  
Oral Tx and Steroid
- Endothelial Keratitis Disciform Keratitis  
Oral Tx and Steroid



## Herpes Zoster Virus

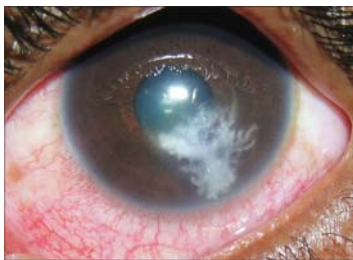


## HZV



## Fungal Keratitis

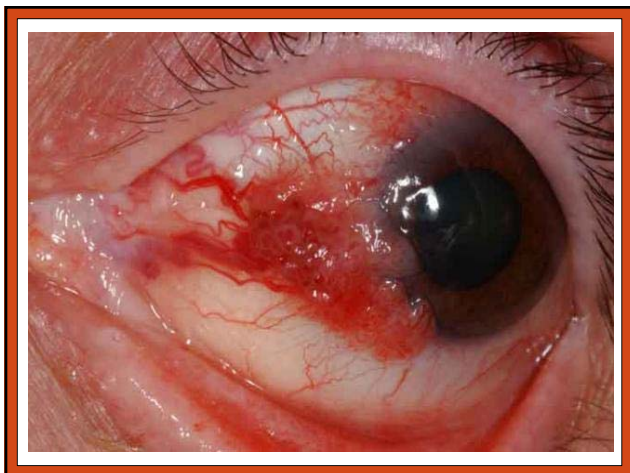
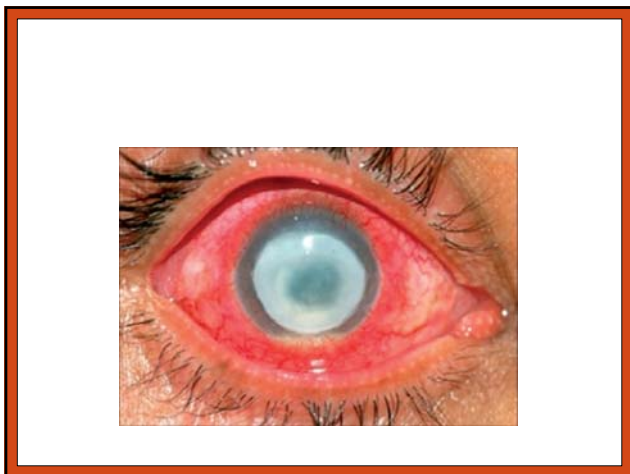
- High Risk – Plant Matter
- Red Eye
- Corneal Lesion – Grey
- Feathery Margins
- Pain
- Blurry Vision
- Discharge and watery
- Photophobia
- Multiple Satellite Foci
- Epithelium Over is Intact
- Amphotericin-B, Anti Fungal



## Acanthamoeba Keratitis

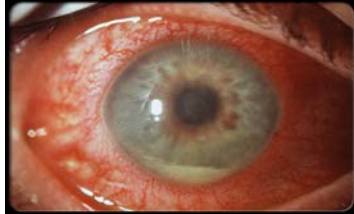
- Contact Lenses and/or Lake Swimming
- Severe Pain
- Less Corneal and Anterior Inflammation than expected
- Red
- Photophobia
- Epi and Sub Epi Infiltrates
- Pseudo Dendrites
- Ring Shaped - Stromal
- Negative Cultures
- Lack of response to Meds
- Aggressive Long Term Meds



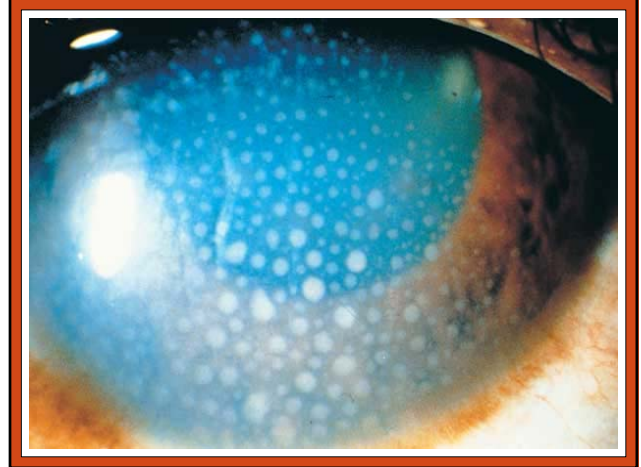


Anterior Chamber

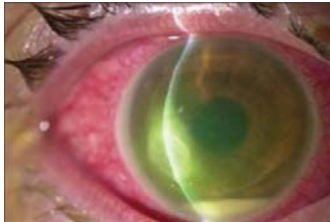
## Uveitis



- Unilateral
- Pain (ache)
- Blurred VA
- Photophobia
- Red Eye PeriLimb
- Hazy AC – KP Deposits – C/F
- Constricted Pupil – Synchiae
- 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

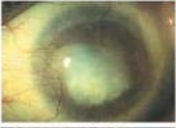







## ROPER HALL CLASSIFICATION

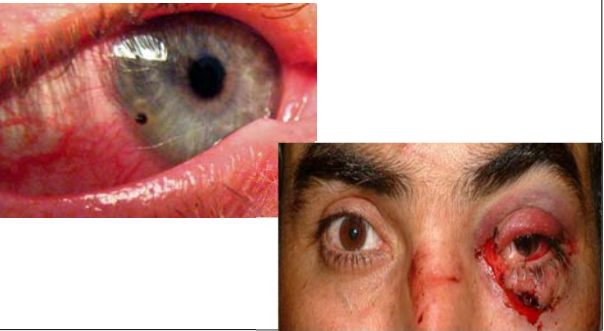
Roper-Hall Classification System			
Grade	Prognosis	Limbal Ischemia	Corneal Involvement
I	Good	None	Epithelial damage
II	Good	<1/3	Haze, but iris details visible
III	Guarded	1/3 to 1/2	Total epithelial loss with haze that obscures iris details
IV	Poor	>1/2	Cornea opaque with iris and pupil obscured



### B Cultures plus Keratoplasty

	Before Treatment	After Treatment
Patient 22		 6 yr
Patient 26		 6.5 yr
Patient 46		 4 yr

## Traumatic causes of Eye Inflammation



# Glaucoma

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

