Common Ophthalmic Problems: Ocular Triage and Treatment

Jeanine Suchecki, M.D.
Associate Professor
Chief Division of Ophthalmology
University of Connecticut Health Center
No Financial Disclosures
The Front Line in Eye Care

- **Eye specialists**
- **Emergency Departments**
- **Family Physicians**

Must be able to quickly and accurately triage eye problems.
- Many problems require referral, you may be able to perform initial key therapy to reduce morbidity.
Ocular Triage and Treatment

- Chemical Burn
  - A true ocular emergency
  - Quick triage and immediate treatment
    - Essential – you may make the difference in outcome
    - Copious irrigation
  - Poison Control Center has product information including pH of solutions
    - Alkali more serious than acid
  - If significant refer to ED
    - Further irrigation
    - Monitor pH
    - Check for foreign bodies
Eye Trauma: Incidence

- 1.3 Million eye injuries per year in the U.S.
- 40,000 of these injuries lead to visual loss
- Highest incident in young males
- Most are preventable
Triage

- Mechanism of injury
- Time of injury
- Actions taken
- Symptoms besides decreased vision/eye pain?
- Duration of symptoms
- Any surgery prior to trauma? Contact lens wear.
- One or both eyes affected?
- Vision at the time of examination?
- Vision prior to trauma?
- Double vision – one eye or both?
Eye Examination

- Vision
  - Near/distance
  - Correction
- External Exam
- Pupils
  - Shape, Reactivity
- Motility Exam
- Anterior Segment
  - Slit Lamp- Magnified
  - Pen light/cobalt filter

- Ophthalmoscopy
- Pressure
  - Unless penetrating injury suspected
- Visual Field
  - Confrontation
Triage

- 50 year old woman presents with:
  - Red, painful eye
  - Decreased vision, halos around objects
  - Headache, Nausea, Vomiting

- Exam reveals:
  - Mid-dilated, fixed pupil
  - Cloudy cornea
  - Shallow anterior chamber

- What is the most likely diagnosis?
  A. Corneal Abrasion
  B. Iritis
  C. Acute Angle Closure Glaucoma
  D. Conjunctivitis
C. Acute Angle Closure Glaucoma

- Increased eye pressure due to mechanical obstruction of aqueous outflow.
  - Symptoms and signs classic, IOP elevated.
  - True ocular emergency.

Treatment:
- Refer for IOP reduction and reversal of angle closure
  - Medical Intervention
    - Pilocarpine 2% drops, Timolol maleate 0.5%, Prednisolone Acetate 1% q 15 min x 4
    - IV Acetazolamide 500mg
    - Oral or IV hyperosmotic (glycerine/isosorbide, Mannitol)
  - Surgical: Laser PI, Trabeculectomy
Triage

- 15 year old girl presents after poking her eye with a mascara wand this morning. She complains of pain, foreign body sensation, photophobia, epiphora, blurred vision.
- Exam with fluorescein dye reveals staining
Corneal Abrasion

- **Treatment**
  - Topical Antibiotic
  - Topical NSAID
  - Patch versus No Patch
    - Never Patch Contact Lens Wearers

- **Refer**
  - Frequent Follow up until resolved
  - Recurrent erosion syndrome
Triage

- 30 year old man presents after he was hit in the eye with the ball while playing racquetball. His chief complaint is blurred vision, photophobia, eye pain, redness.

- Differential Diagnosis?
  - Subconjunctival hemorrhage
  - Corneal abrasion
  - Traumatic iritis
  - Hyphema
  - Suspect vitreous hemorrhage, retinal edema or detachment, ruptured globe, orbital fracture, traumatic iris sphincter tear
Subconjunctival Hemorrhage

- Broken blood vessel within conjunctiva
- Typically benign
  - Often spontaneous
- No treatment necessary
- Associated injuries possible
  - Abrasion, Iritis, Orbital fracture
Hyphema

- Blood in anterior chamber
- 25% chance of associated ocular injury
  - Vitreous Hemorrhage
  - Retinal Detachment
  - Ruptured Globe

Treatment
- Refer
  - HOB 45'
  - Topical Steroid, cycloplegic
  - Risk of rebleed in 3-5 days, increased IOP
  - Daily monitoring
Triage

- 40 year old male working under his car had something fall in his eye. He presents with symptoms of foreign body sensation, tearing, photophobia. Penlight exam reveals a 1.5mm foreign body in the cornea.
Corneal Foreign Body

- Often metallic
  - Iron causes rust ring and
  - Inflammatory effect
- Suspect penetrating injury if high speed mechanism involved
  - Hammering metal on metal, Mowing
- Refer for Removal
  - Always removed at the slit lamp under high magnification
  - Lids everted to check for FBs
Triage

- 50 year old woman presents with 2 day history of right eye irritation, foreign body sensation, photophobia and tearing. She was at the beach and may have had sand blow in her eye although she doesn’t recall a specific incident.
- Examination with fluorescein dye is performed, see image.

What is your diagnosis?

A. Corneal Abrasion
B. Corneal Foreign Body
C. Iritis
D. Herpes Simplex Dendritic Keratitis
Infectious Epithelial keratitis

- Herpetic Keratitis is the leading cause of corneal blindness in the U.S.
  - 20,000 new cases annually, 28,000 reactivations
- Active viral replication
- Treatment
  - Refer – frequent monitoring
  - Can resolve spontaneously in 3 weeks
  - Treatment minimizes stromal damage and scarring
  - Epithelial debridement, topical ganciclovir, trifluridine, Oral therapy
Recurrent Herpes Simplex keratitis*

- HSV keratitis may be divided into 4 categories:
  - Infectious epithelial keratitis
  - Neurotrophic Keratopathy
    - Impaired corneal innervation
    - Non preserved lubricants, patching, bandage contact lenses, autologous serum, tarshorrphy. Stromal thinning may lead to perforation and surgery.
  - Stromal keratitis and Endotheliitis
    - Immune response to virus or antigen
    - Active virus in stroma
    - Steroid antiviral combination
    - Necrotizing form can lead to perforation
  - A leading indication for corneal transplantation
68 year old woman presents with 3 day history of burning and pain on left side of forehead and scalp. Eye swollen shut.

Examination reveals vesicles on face in Trigeminal V1 distribution. Hutchinson’s sign.

- 10% of all cases
- 50% will develop ophthalmic involvement
Herpes Zoster Ophthalmicus: Triage

- **Symptoms:**
  - Foreign body sensation, photophobia, blurred vision
  - May Occur: Days, Weeks after Rash

- **Findings:**
  - Conjunctivitis, epithelial keratitis (pseudo-dendritic), stromal keratitis, anterior uveitis, optic neuritis, retinitis, cranial nerve palsies

- **Ocular Disease may be active for years**
  - Can lead to chronic uveitis, corneal disease, glaucoma
  - Often need chronic topical steroid therapy

- **Treatment:** Refer for ophthalmic evaluation
30 year old contact lens wearer complains of redness, irritation, photophobia, tearing, and decreased vision.

Seen and patched overnight. Today with increased discomfort, she removed patch this am and noticed a white spot on eye.

What is the likely diagnosis?
A. Corneal Ulcer
B. Corneal Abrasion
C. Iritis
D. Conjunctivitis
Corneal Ulcer

- **Infectious Keratitis**
  - Immunocompromised, Injury
  - CL Wearers
    - Pseudomonas, Staph, Strep most common
    - Acanthamoeba, fungal

- **Treatment:**
  - Refer Immediately
  - Ophthalmic Emergency
    - Ophthalmology will perform scraping and plating cultures
    - Fortified Broad Spectrum Topical Antibiotics
The Red Eye…

- Very common cause for office visit
  - Causes range from benign to serious
  - May be sight threatening
  - Every case thus far associated with red eye

- FP frequently triage these patients
  - Remember
    - Foreign body sensation may be dry eye related or a sign of more serious corneal problem.
    - Pain and photophobia are often associated with corneal disease or iritis. Refer.
Classification of Red Eye

- **Anatomical**
  - Conjunctivitis
  - Keratitis/Ulcer
  - Iritis
  - Episcleritis
  - Scleritis
  - Lids/Adenexa
  - Acute Glaucoma

- **Pathophysiologiical**
  - Allergic
  - Bacterial
  - Viral
  - Fungal
  - Toxic
  - Dry Eye
  - Immunologic
  - Trauma
## Symptoms & Etiology

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Probable Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching</td>
<td>Allergy</td>
</tr>
<tr>
<td>Scratching sandy &amp; burning, fbs</td>
<td>Dry eyes, lid problems, corneal problems</td>
</tr>
<tr>
<td>Lid tenderness</td>
<td>Chalazion, sty</td>
</tr>
<tr>
<td>Intense pain</td>
<td>Corneal abrasion, iritis, scleritis, acute glaucoma, sinusitis</td>
</tr>
<tr>
<td>Photophobia</td>
<td>Corneal abrasion, iritis, acute glaucoma, HSV keratitis</td>
</tr>
</tbody>
</table>
Viral Conjunctivitis

- **Triage:**
  - Watery - serous discharge
  - Conjunctival injection
  - Eye lid edema
  - Pre-auricular lymph node
  - One eye first, then other

- **Most common:**
  - EKC, PCF  Pharyngoconjunctival fever
  - URI, sore throat, fever may be associated

- **Typical mild viral conjunctivitis requires no treatment and will resolve in days-week**
Epidemic Keratoconjunctivitis (EKC)*

- Acute onset, follicular conjunctivitis
  - Adenovirus (types 8,19,27,37)
  - Bilateral, often asymmetrical

- Triage:
  - FBS, pain, mucoid discharge,
  - blurred vision, photophobia (10 days)
  - Findings: lid edema, preauricular node
    - Subconjunctival hemorrhage
    - Pseudomembranes in 1/3

- Conjunctivitis lasts 2-3 weeks, 10-14 d corneal involvement occurs, lasts 6-12 months

- Treatment: Refer for treatment of keratitis
Bacterial Conjunctivitis

- Acute onset, papillary conjunctivitis
  - Staph, Strep, Pseudomonas, Haemophilus
  - Bilateral, often one eye first

- Triage
  - Symptoms: Redness, irritation, discharge
  - Findings
    - Injection with papillary reaction
    - May be hemorrhagic, chemosis
    - Mucopurulent discharge
    - Eyelids and lashes matted

- Treatment: Refer
  - Culture, Topical antibiotics
    - Polytrim, Fluoroquinolone
  - Some forms can lead to corneal perforation
  - Hyperacute - Neisseria – GC - Systemic antibiotics
Seasonal Allergic Conjunctivitis

- **Findings**
  - Lid edema
  - Conjunctival injection/chemosis
  - Papillary reaction

- **Treatment**
  - Avoid allergens, desensitization
  - Tears, cool compresses
  - Topical antihistamines & vasoconstrictors, mast cell stabilizers. OTC Naphcon, Zaditor, Rx Patanol, Lastacaft
  - Refer
    - Topical NSAIDS
    - Steroids - rarely

- Very common
  - Symptoms present based on specific allergens
  - Pollen, Ragweed

- **Triage:**
  - Itching, burning, watery discharge
  - Associated symptoms (nasal congestion, sinusitis)
Perennial Allergic Conjunctivitis

- Chronic conjunctivitis can be difficult to differentiate

**Triage**
- Signs & symptoms similar to SAC, but present all year
- Dust mites, cockroaches, & pet dander

**Treatment**
- Avoid allergens, desensitization, tears, cool compresses, topical antihistamines & vasoconstrictors, mast cell stabilizers
- Refer
  - Cultures
  - NSAIDS
  - Steroids
Contact Allergic Conjunctivitis*

- Any contact to ocular area
  - Lotions, detergents, perfumes
  - Ocular medications and Solution preservatives are frequent offenders
    - Neomycin, Glaucoma therapeutics, Thimerosol, BAK & others

- Triage
  - Unilateral or bilateral
  - Redness, itching, burning, fbs, tearing
  - Findings:
    - Skin of lids typically red, lichenification
    - Conjunctival injections
    - Palpebral follicles, may have papillae

- Treatment
  - Avoid allergens, tears, cool compresses, topical antihistamines & vasoconstrictors, mast cell stabilizers
  - Refer
    - If on topical therapy
    - Treatment of conjunctivitis may lead to CAC
  - NSAIDS, Steroids
Dry Eye

- Very Common cause of red irritated eyes
- 15 – 20 % over age 40
- Impact on quality of life
  - Moderate dry eyes = moderate angina
- Causes functional visual loss and many ophthalmologist office visits.
Dry Eye

- **Systemic Associations**
  - Auto immune disease
  - Rosacea
  - Sequella of SJS, Zoster
  - Mucous membrane pemphigoid
  - Chemotherapy related, GVHD related
  - Hormonal changes
  - Thyroid disease
Dry Eye

- Medications
  - Anti-hypertensives
  - Diuretics
  - Many psychotrophic meds
  - Anti-allergy
  - Decongestants
  - Topical eye drops
Dry Eye

- Environmental/personal
  - Wind, cold
  - Dry environment, low relative humidity
    - Air conditioning, Heat (heated air dryer than desert)
  - Chemicals
    - Cleaning, cosmetics, fragrances, smoking
  - Contact lenses
  - Age
  - Wide lid aperture
  - Low blink rate
Dry Eye “Flow” Sheet

Effect of the Environment
- Milieu Intérieur
  - Low blink rate
  - Behavior: VTU, microcopy
  - Wide lid aperture
  - Gaze position
  - Aging
  - Low androgen pool
  - Systemic drugs: antihistamines, beta-blockers, antispasmodics, dilutants, and some psychotropic drugs
- Milieu Extérieur
  - Low relative humidity
  - High wind velocity
  - Occupational environment

Aqueous-deficient
- Sjogren Syndrome Dry Eye
- Non-Sjogren Dry Eye
  - Primary
  - Secondary
    - Lacrimal Deficiency
    - Lacrimal Gland Duct Obstruction
    - Reflex Block
    - Systemic Drugs

Evaporative
- Intrinsic
  - Meibomian Oil Deficiency
  - Disorders of Lid Aperture
    - Low Blink Rate
    - Drug Action Accutane

- Extrinsic
  - Vitamin A Deficiency
  - Topical Drugs Preservatives
  - Contact Lens Wear
  - Ocular Surface Disease, e.g., Allergy
Triage

**Symptoms:**
- Discomfort, soreness
  - relief with eye closing
- Burning, stinging, redness
- Foreign-body sensation, sandy-gritty feeling
- Blurry, fluctuating vision-
  - Usually clears with blink
- Photophobia
- Paradoxical tearing
- Intolerance to certain environmental conditions
Dry Eye Treatment

- **Lubricant drops, gels, ointment**
  - Mild - Drops 4x/day, or at computer/while reading
  - Avoid vasoconstrictors
  - Environmental changes (humidifier, car vents, no fans)

- **Refer**
  - Mild to Severe – Drops and gels every 1-2 hours ointment at night
    - Avoid preservatives over 4x/day dosing (and severe KCS)
    - Restasis, Steroids, Autologous Serum
    - Punctal plugs
    - Environmental changes (moisture chamber)
Scleritis

- **Triage**
  - Severe pain, tenderness
  - Photophobia and tearing

- **Findings**
  - Marked inflammation
  - Dilation of superficial and deep episcleral vessels
  - Scleral edema
  - Bluish-red appearance
  - Sectoral, diffuse, nodular necrotizing
Scleritis

- 50% associated with systemic disease
  - Rheumatoid Arthritis, Systemic Lupus
  - Ankylosing Spondylitis, Wegner’s Granulomatosis
  - Herpes Simplex, Gout, Syphilis

- Ocular complications
  - Cataracts, glaucoma, choroidal or retinal detachment, optic atrophy

- Treatment - Refer
  - Topical steroids, systemic steroids, NSAID, other immune modulating drugs.
Iritis*

- **Triage:**
  - Pain-dull in and around eye
  - Photophobia, decreased vision, redness

- **Findings**
  - Injection, perilimbal flush
  - Pupil: sluggish reaction
  - AC: flare and cells
  - Severe may form hypopyon
  - Cornea: keratitic precipitates

- **Treatment:** Refer
  - Steroids and cycloplegics,
  - May be associated with systemic disease
Iritis*

- Ankylosing spondylitis
- Herpes simplex
- Lyme disease
- Ulcerative colitis
- Reiter’s syndrome
- Psoriatic arthritis
- Juvenile chronic arthritis
- Sarcoidosis
- Bechet’s disease
- TB/ Syphilis
- Unknown idiopathic

- CBC, ESR, VDRL, FTA-Abs, HLA-B27, Lyme titer
- RF, ANA, ACE
- PPD
- Chest x-ray
- Lumbosacral and hand x-rays
## Differential Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Conjunctivitis</th>
<th>Iritis</th>
<th>Scleritis</th>
<th>Acute Glaucoma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vision</strong></td>
<td>normal</td>
<td>normal</td>
<td>normal</td>
<td>decreased</td>
</tr>
<tr>
<td><strong>Discharge</strong></td>
<td>present</td>
<td>0</td>
<td>rarely</td>
<td>0</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>none</td>
<td>mild-mod</td>
<td>mod-severe</td>
<td>severe</td>
</tr>
<tr>
<td><strong>Pupil</strong></td>
<td>normal</td>
<td>normal/ constricted</td>
<td>normal</td>
<td>mid-dilated</td>
</tr>
<tr>
<td><strong>Light Response</strong></td>
<td>normal</td>
<td>normal/ Sluggish</td>
<td>normal</td>
<td>non-reactive</td>
</tr>
<tr>
<td>** Conj. Injection**</td>
<td>diffuse</td>
<td>limbal flush</td>
<td>diffuse or segmental</td>
<td>diffuse</td>
</tr>
<tr>
<td><strong>Cornea</strong></td>
<td>clear</td>
<td>clear/KP</td>
<td>clear</td>
<td>hazy/irreg. reflex</td>
</tr>
</tbody>
</table>
Transient Visual Disturbance: What is the Differential Diagnosis?

- 65 year old woman presents with new onset flashes of light in her left eye. No decrease in vision.
  
  - What is in your differential diagnosis?
    - Vitreous detachment
    - Retinal hole or detachment
    - Ocular migraines
Transient Visual Disturbance: Ocular Migraine

- **Triage**
  - Scintillating scotoma, zigzag patterns, or complete loss of vision lasting usually 10–60 min and sometimes followed by headache
- **Often in young patients**

**Clinical evaluation**

- Differentiate from vitreous detachment (quick flashes, floaters), amaurosis fugax (seconds to minutes of vision loss, curtain coming down in vision)
Transient Visual Disturbance: Vitreous Detachment

- **Triage:**
  - Sudden appearance of floaters (specks, circles, cobwebs), sometimes accompanied by quick light flashes

- **Vitreous separation from retina**
  - Typically benign, normal change in vitreous
  - Risk factors: > 50, myopia, trauma

- **Treatment:**
  - Refer for dilated retinal exam
  - Evaluate for retinal hole, detachment
Sudden Vision Loss:
What is the Differential Diagnosis?

- 80 year old woman presents with sudden significant loss of vision in her right eye only.

- What is in your differential diagnosis?
  - CRAO
  - CRVO
  - Vitreous Hemorrhage
  - Retinal Detachment
  - Acute Glaucoma
  - Temporal Arteritis
  - NAION

- What would be your differential diagnosis if she were 37 years old?
  - Retinal Detachment, Vitreous hemorrhage, Optic neuritis
Retinal Detachment

- **Triage:**
  - Increase in floaters, photopsias (flashing lights)
  - Shadow in peripheral vision, loss of part/all vision
  - Visual field defect, retinal tear/detachment or vitreous hemorrhage

- **Risk factors:**
  - Trauma, eye surgery, moderate-severe myopia

- **Treatment:**
  - Refer
  - Retinal hole may require laser
  - Retinal tear/detachment may require surgical intervention
Vitreous Hemorrhage

- **Triage:**
  - Previous floaters or spider web in vision
  - Often red seen, increasing over time
  - Fundus exam: limited or no view of retina

- **Risk factors**
  - Diabetes, retinal tear, sickle cell anemia, trauma

- **Treatment:**
  - Refer for evaluation
  - If limited view - ultrasonography to assess retina
  - Monitor, surgery
Central retinal vein occlusion

- **Triage:**
  - Sudden decrease in vision.
  - Asymptomatic.
  - Multiple widely distributed retinal hemorrhages, cotton wool spots on ophthalmoscopy

- **Risk factors**
  - Glaucoma, hypertension, hyperviscosity syndrome

- **Treatment**
  - Refer, treat underlying conditions
  - Monitor for macular edema, neovascularization, neovascular glaucoma
  - Intravitreal injections, laser
Central Retinal Artery Occlusion

- **Triage:**
  - Sudden onset of severe vision loss.
  - CRAO: Pale retina, cherry-red fovea
  - BRAO: May see Hollenhorst plaque (refractile object at the site of arterial occlusion)
  - Risk factors for vascular disease

- **Treatment:**
  - 90 minutes to reverse
    - Ocular massage
    - Decrease IOP anterior chamber paracentesis
    - TPA – not for CRAO
  - ESR to exclude giant cell arteritis
  - Stroke/Cardiovascular evaluation
    - EKG, Carotid doppler, Echo, Holter Monitor
Temporal Arteritis (GCA)

- Visual loss one of the most significant causes of morbidity
  - True Neuro Ophthalmic emergency
  - 33% have visual symptoms within a few weeks of the onset.
    - 45% transient (amaurosis/diplopia)
    - 55% permanent (partial/complete) anterior ischemic optic neuropathy (AION)
  - 65% of untreated patients will develop visual loss in the second eye within weeks of the first.

- Triage
  - Sudden profound painless loss of vision
  - Systemic prodromal symptoms
    - Anorexia, fever, malaise, myalgia
  - Headache, scalp tenderness, jaw claudication
  - Age > 50 years
  - History of Polymyalgia
Temporal Arteritis: Ophthalmic findings

- Most common cause of vision loss is anterior ischemic optic neuropathy (AION)
  - Optic disc edema, chalky white
    - May have splinter hemorrhages
  - Visual field defect:
    - Inferior altitudinal or nasal sectoral
    - Central scotoma
  - May present also with
    - Retrobulbar ischemic ON
    - CRAO, BRAO, Choroidal ischemia
    - Diplopia, ptosis, INO, nystagmus
Temporal Arteritis: Testing and Treatment

- ESR elevated (moderate or >100mm/h)
- C-Reactive Protein
  - (greater than 2.45 mg/dL associated with positive temporal artery biopsy, can be followed serially to monitor treatment)

**Treatment**
- High Dose Steroids
  - 22 fold increased chance of vision improvement if started within 24 hours. Damage may be irreversible if delayed beyond 48 hours.
- Temporal Artery Biopsy (focal granulomatous arteritis with giant cells and skip lesions)
- Refer: Rheumatology, Neuro-ophthalmology
Sudden Vision Loss

- **Triage**
  - Painless vs painful
  - Transient vs permanent
  - Age
  - May or may not be ‘eye’ related

- **Visual Disturbance**
  - Vitreous detachment
  - Ocular migraine
  - Amaurosis fugax
  - Visual hallucinations

- **Sudden Vision Loss**
  - Retinal hemorrhage
  - Retinal detachment
  - Retinal artery or vein occlusion
  - Stroke (field cut) - bilateral
  - Acute Glaucoma
  - Optic neuritis
  - Temporal arteritis
  - Medication induced
Summary

- Always evaluate vision.
- Red eye:
  - Treat conjunctivitis, refer if associated significant photophobia associated – may have keratitis or iritis
  - Don’t patch contact lens associated red eyes
  - Refer if considering topical steroids

- Sudden Loss of Vision
  - Check for bilateral vs unilateral loss.
  - Use the ophthalmoscope
  - Refer when in doubt
Thank You
Summary

- Triage of common eye problems

- Three days ago my right eye started to get red and slightly irritated with some teary discharge, now my left eye has the same thing.

- Over the past week my right eye has become more red, painful and now very light sensitive.

- My coworker noticed that part of my eye was suddenly red this morning, no pain, no symptoms - gradually worse.
Summary

- Triage of common eye problems

- I woke up this morning and had no vision in my left eye.

Mature Cataract

Central Retinal Artery Occlusion

Temporal Arteritis
Dry Eye Treatment Goals

- Identify and halt progression
- Prevent or reduce ocular surface injury
- Eliminate or reduce patients discomfort
- Emotional support
  - Chronic disease, varying therapy
  - Partnership

- Ameliorate symptoms
  - Artificial tears
  - Preserve existing tears
    - Punctal occlusion
    - Increased humidity
    - Moist chamber goggles
- Increase tear volume
  - Taping, tarsorrhaphy
- Anti-inflammatory treatment
  - cyclosporin