

## Summary Slide

The following course was produced by the American Board of Opticianry and the National Contact Lens Examiners in cooperation with the Contact Lens Society of America, the National Academy of Opticianry, the National Federation of Opticianry Schools, and the Opticians Association of America. Copyright 1998, Revised 2022

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## ABO / NCLE Advanced Certification Course

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## ABO / NCLE Advanced Certification Course

Taking these courses today does  
**NOT** mean you will pass your test

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## Emergency Response and Referral Procedures

ABO / NCLE  
Advanced Certification Course

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## Learning Objectives

At the conclusion of this course, the student will be able to:

- recognize and refer ocular emergencies

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## Triage

Sorting emergencies into urgent, priority and routine categories and routing them to the appropriate medical facility.



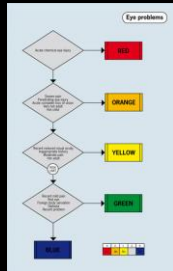
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## Importance of Triage

An error in judgment may cause:

- Needless discomfort
- Possible loss of vision
- Potential malpractice suit

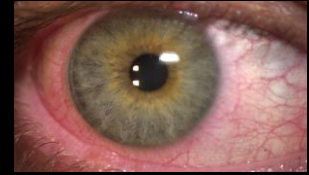
<b>MOST URGENT</b>	<b>Examples May Include:</b> <ul style="list-style-type: none"> <li>• Injured Car Accident</li> <li>• Cardiac Overexertion</li> <li>• Suspected Head Attack</li> <li>• Suspected Stroke</li> <li>• Contact Sports</li> </ul>
<b>URGENT</b>	<b>Examples May Include:</b> <ul style="list-style-type: none"> <li>• Allergic reaction (eye)</li> <li>• Allergic reaction (nasal)</li> <li>• Allergic reaction (throat)</li> <li>• Allergic reaction (skin)</li> <li>• Allergic reaction (systemic)</li> </ul>
<b>LESS URGENT</b>	<b>Examples May Include:</b> <ul style="list-style-type: none"> <li>• Allergic reaction (eye)</li> <li>• Allergic reaction (nasal)</li> <li>• Allergic reaction (throat)</li> <li>• Allergic reaction (skin)</li> <li>• Allergic reaction (systemic)</li> </ul>



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## Inflammatory Reactions

The eye can only react in a limited number of ways to an infinite number of insults



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## RSVP

- Redness
- Sensitivity to light
- Vision
- Pain



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## Contact Lens Complications

Potential complications can range from mild to severe

**"When in doubt, take it out"**

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## Contact Lens Complications

Many complications will resolve with lens discontinuation

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## If In Doubt

- Check questionable emergencies with physician
- Err on the side of caution
- Schedule the patient ASAP



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## Priority Cases

- Most contact lens related priority cases can be managed by the fitter.
- Non contact lens related priority cases should be referred to the physician.

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## Tell Patient To Remove Lenses In Case Of

- Pain
- Redness
- Discharge
- Tearing
- Photophobia
- Foggy vision
- Haloes around lights
- WHEN IN DOUBT, TAKE IT OUT!

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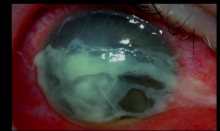
## Take A Good History

- What type of lenses are you wearing?
- Any redness, pain, itching, discharge, blur?
- Any sensitivity to light?
- When did the symptoms start?
- Did you try to treat them in any way?

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## Discharge

- Serous -clear
- Mucoïd - increased secretion of mucus by goblet cells
- Purulent - containing pus
- Mucopurulent - associated with most eye infections



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## Generally Speaking

- **Allergic** - papillae, chemosis  
serous or muco-serous
- **Bacterial** - papillae  
mucopurulent or purulent
- **Viral** - follicles, chemosis  
serous or muco-serous
- **Toxic** - follicles, chemosis  
serous or muco-serous



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## History Taking

- Did you go to the ER or your family doctor?
- What solutions do you use? Please bring them.
- Do you usually sleep with your lenses in?
- Did you accidentally fall asleep with your lenses before the problem started?
- Did you wear your lenses longer than usual before your symptoms occurred?

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## Critical Emergencies Non Contact Lens Related

- Chemical burns
- Sudden loss of vision
- Penetrating injuries

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## Urgent Situations

Blunt trauma  
Penetrating trauma  
Chemical Injury  
Foreign object

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## The Red Eye

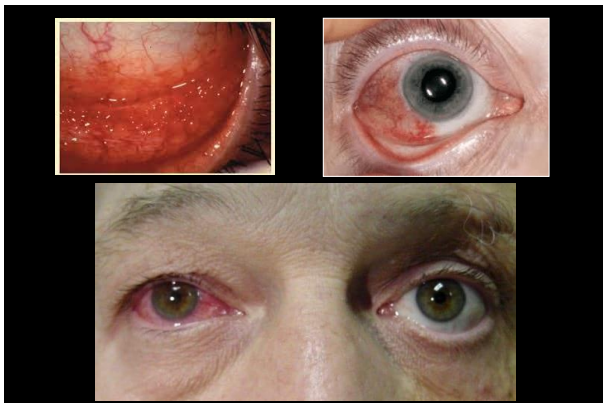
- Conjunctivitis
  - Bacterial
  - Viral
  - Chemical
  - Allergic
  - GPC

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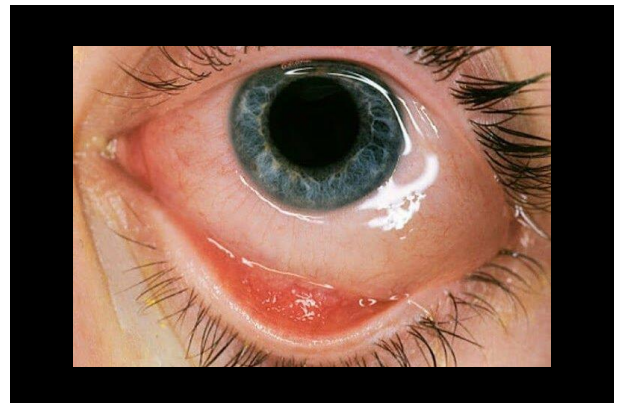
## The Red Eye

- Keratitis
- Keratoconjunctivitis
- SCH
- Corneal ulcers
- Acanthamoeba keratitis
- Corneal abrasions
- Foreign bodies

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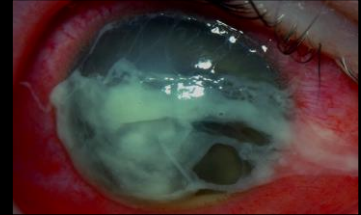
## The Red Eye

- Hypoxia
- Tight fitting lens
- Solution sensitivity
- Iritis
- Episcleritis
- Angle closure glaucoma

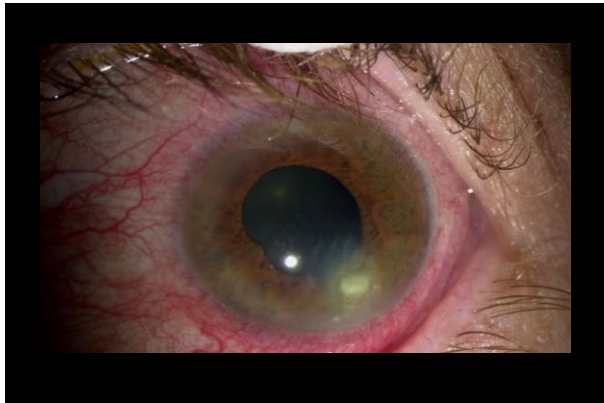
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## Corneal Ulcers

- Bacterial
- Viral (HSV)
- Fungal
- Sterile



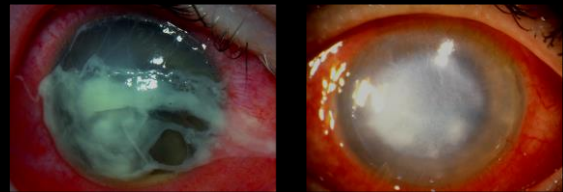
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## CL Pathology

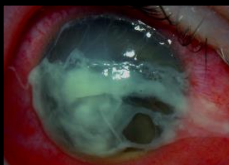
Corneal ulcer



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## Corneal Ulcer

- Epi defect = "ulcer"
- If sterile (no SEI) = sterile
- Microbial keratitis if epi defect and SEI
- Often pain, redness, photophobia
- AC reaction



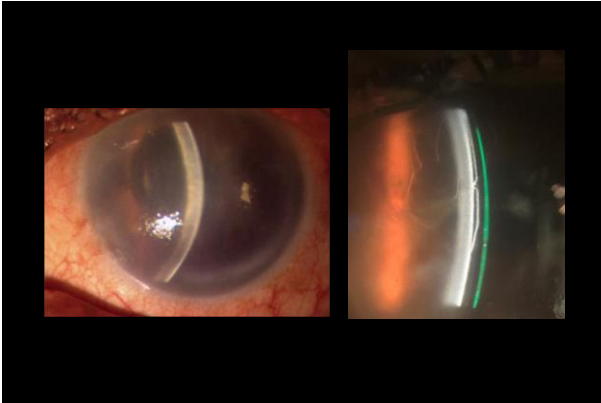
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## Symptoms / Signs of Corneal Involvement

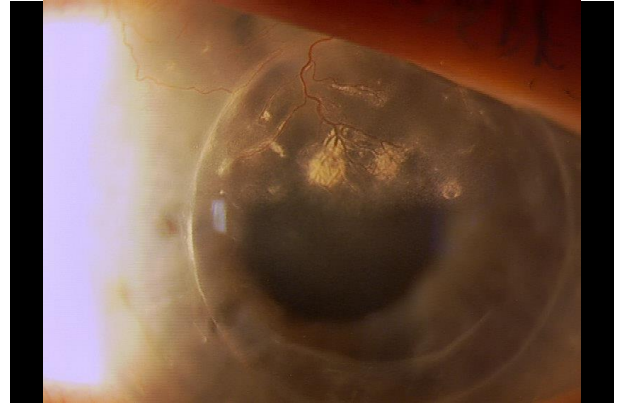
- Blurred or cloudy vision
- Pain
- Photophobia
- AC reaction
- Circumcorneal injection "ciliary flush"



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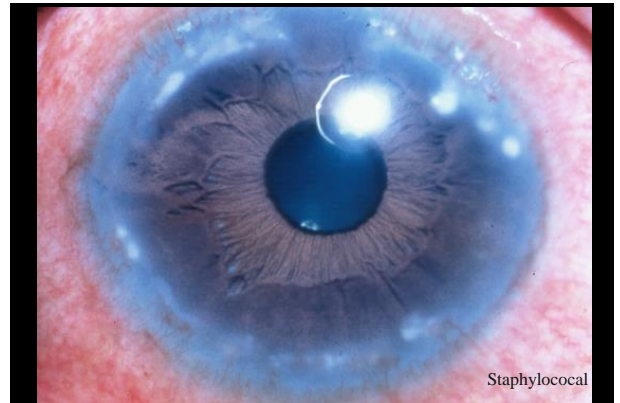


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## Examples of Corneal Pathology

- Inflammation
- Abrasion
- Foreign body
- Chemical burn
- Damaged or poorly fit contact lens
- Corneal ulcer
- Infection

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## Infiltrates

- WBC help to fight invading micro-organisms
- Involved in repairing damaged tissue
- Body's response to injury and / or infection
- Derived from tear film and limbal vessels
- Sterile or bacterial

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## Corneal Infiltrates

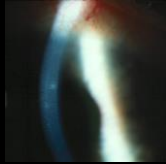
- Inflammatory response to:
  - Trauma
  - Viral infection
  - Allergy
  - Toxic substances
  - Hypoxia
  - Environmental stimuli
  - Lid margin

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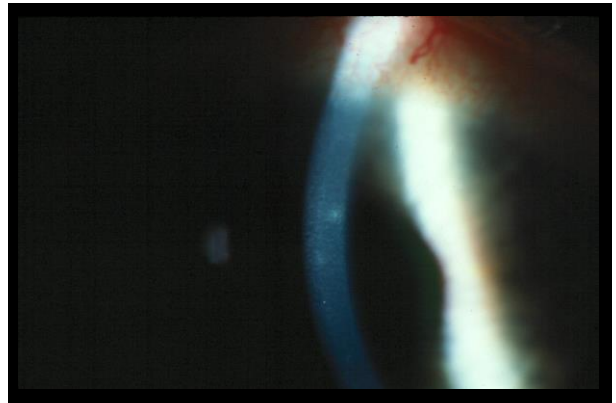


## Corneal Infiltrates

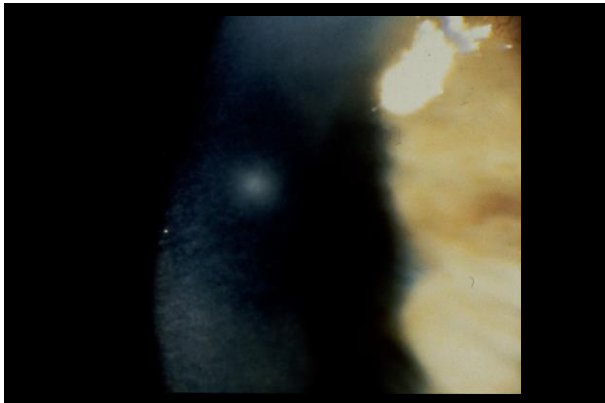
- Round, grayish-white sub-epithelial or stromal areas
- Measure size and document location / depth
- Often with acute red eyes
- May resemble corneal ulcer



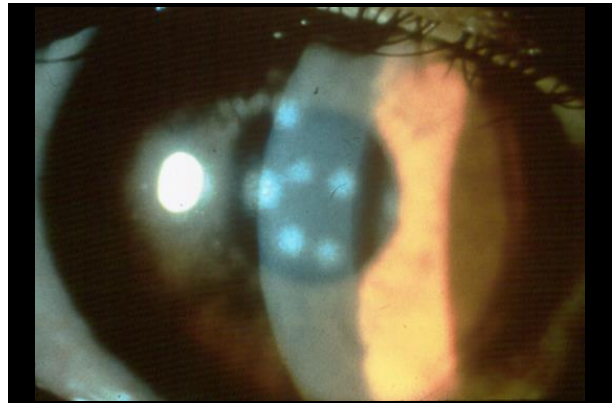
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## Acanthamoeba Keratitis

- Rare parasitic infection
- 1 / 500,000 incidence
- Red eye, photophobia
- Pain out of proportion to findings
- Pseudodendrite (often misdiagnosed as herpes simplex)
- Ring infiltrate
- Question patient regarding homemade saline, tap water rinses, wearing lenses in pool or hot tub

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## Case HX

- Gram stain + acanthamoeba
- Confocal + acanthamoeba
- Culture + acanthamoeba (next day)
- PF bid, atropine qd, neosporin q 1 hr,  
itraconazole 400 mg po qd, baquaciel  
.02% q 1 hr, continue ACV

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## Acanthamoeba Keratitis

Found in many environments

- soil
- dust
- fresh water
- seawater
- chlorinated pools
- hot tubs
- domestic tap water
- bottled water

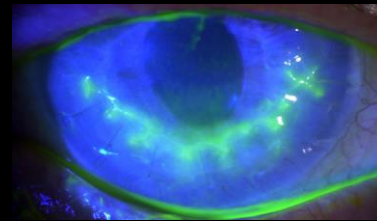
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## Acanthamoeba Keratitis

- Water-borne parasite
- Survive and grow feeding on other bacteria
- Their double thick wall makes them tough to kill
- CL storage cases is often their home



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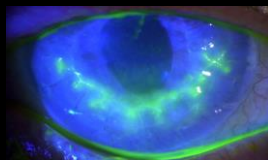


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## Potential Complication Categories

Inflammations

- Toxic
- Allergic
- Infectious
- Mechanical



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## Corneal Staining Remediable by Contact Lens Fitter

- 3 and 9 o'clock staining
- Arcuate staining
- Foreign body tracks (unless deep)
- Dimple veiling
- SPK from solution sensitivity, dirty or damaged lenses, improper lens fits
- Lens-related hypoxia
- CL over wear

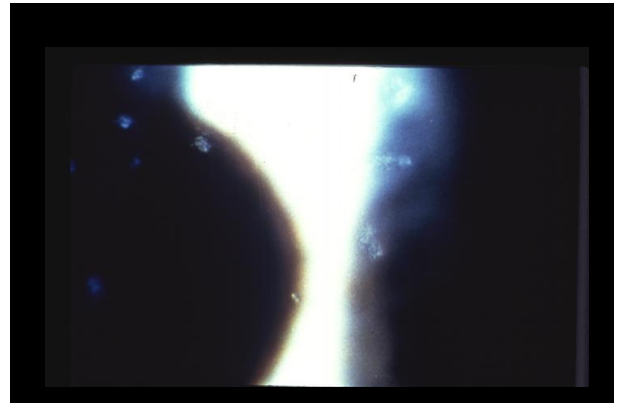
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## SUPERFICIAL PUNCTATE KERATITIS

- FUCH'S 1889
- USED TO DESCRIBE EPIDEMIC KERATOCONJUNCTIVITIS
- PROBABLY EKC AS WE NOW KNOW IT

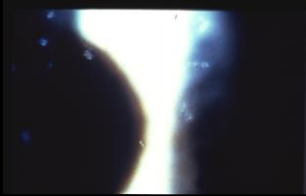
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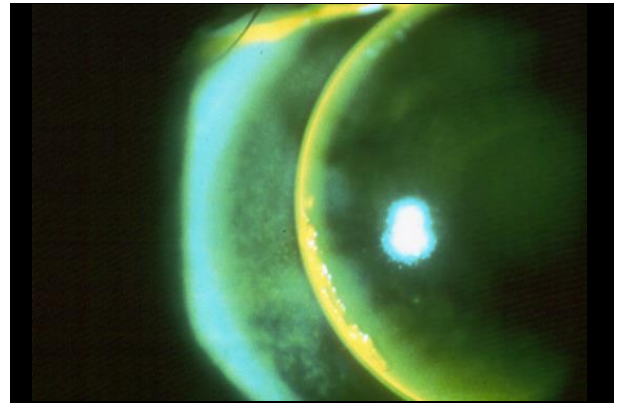
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## SUPERFICIAL PUNCTATE KERATITIS

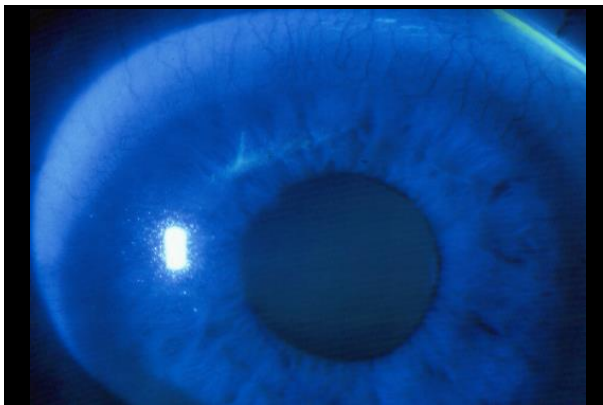
- THYGESON 1950
- SPECIFIC CORNEAL FINDINGS BECAME KNOWN AS SPK OF THYGESON



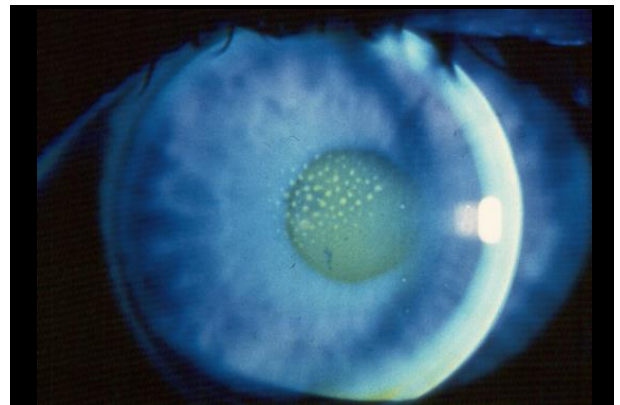
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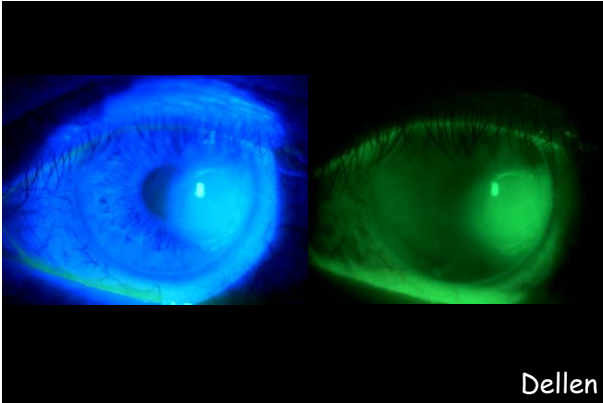
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### Corneal Staining

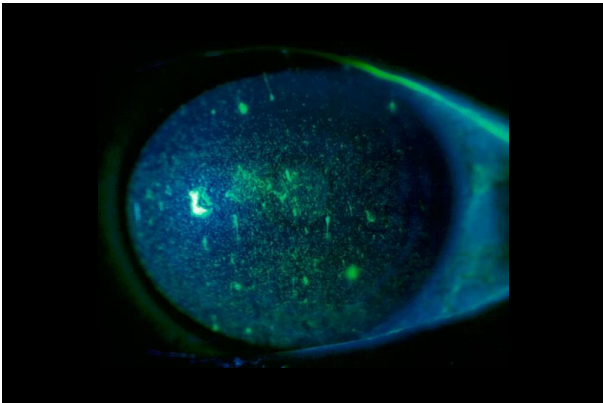
Refer to Eye Care Practitioner

- Possible viral infections
- Unknown etiology
- Severe coalesced staining from any cause
- Dellen formation
- Discrete lesions

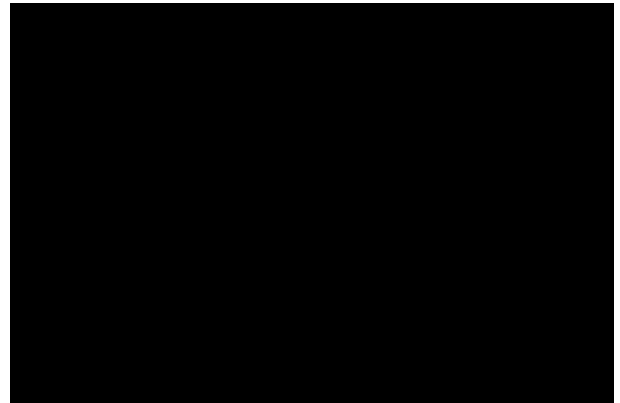
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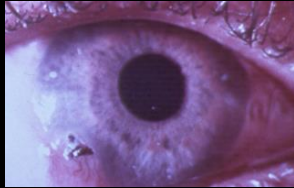
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## Corneal Abrasions and Foreign Bodies

- Redness
- FBS
- Sharp, stabbing pain
- Photophobia



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## Lens Adhesion

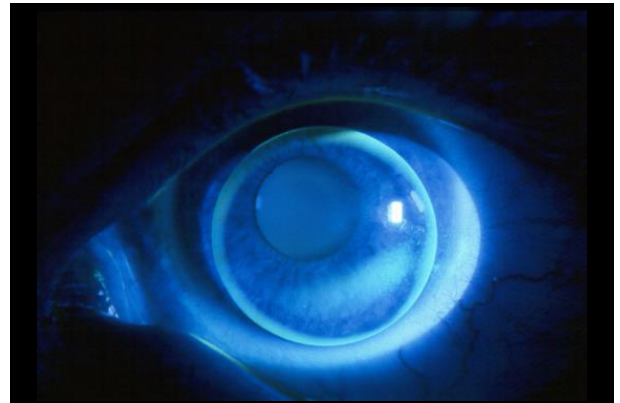
- Can usually be remedied by CL fitter
- Causes of soft lens adhesion
  - Use of tap water
  - Dehydration
  - Sleeping with lenses
  - Tight fit

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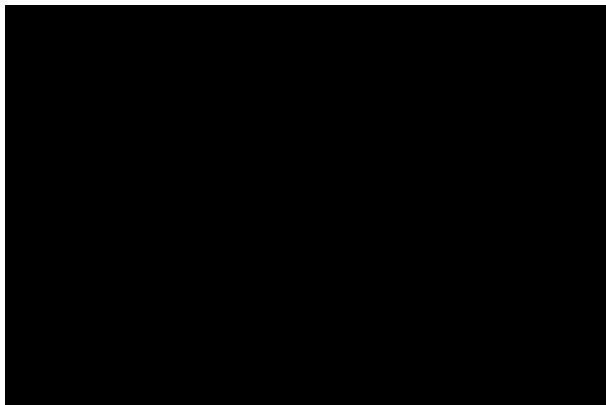
## Lens Adhesion

- Causes of GP lens adhesion
  - Dry eyes (loss of aqueous)
  - Abnormal tear chemistry
  - GP extended wear
  - Need to increase depth of lens

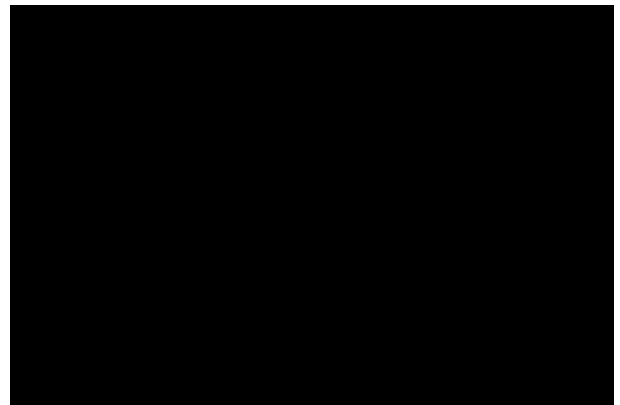
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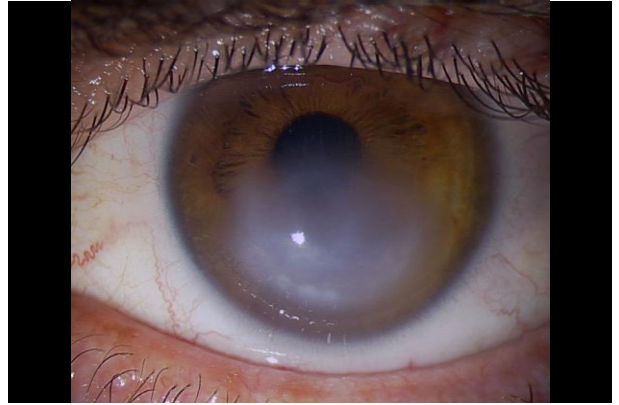
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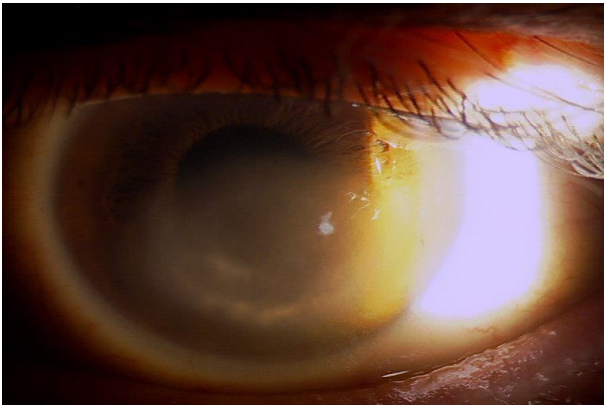
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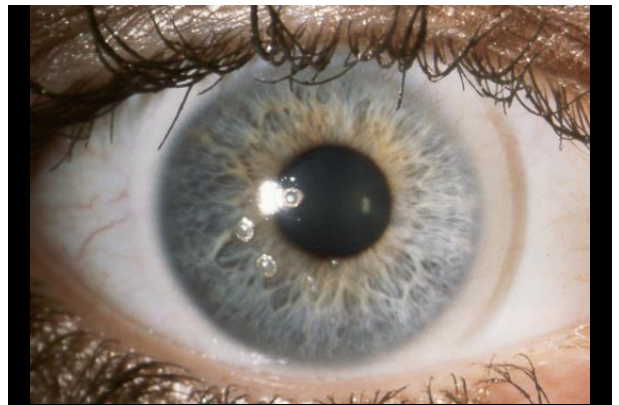


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## Cloudy Vision

- May be remedied by fitter
- Determine if cornea or contact lens
- Possibly corneal edema
- Old or coated lenses
- Steep / tight lenses
- IOP
- Pre-existing corneal dystrophy

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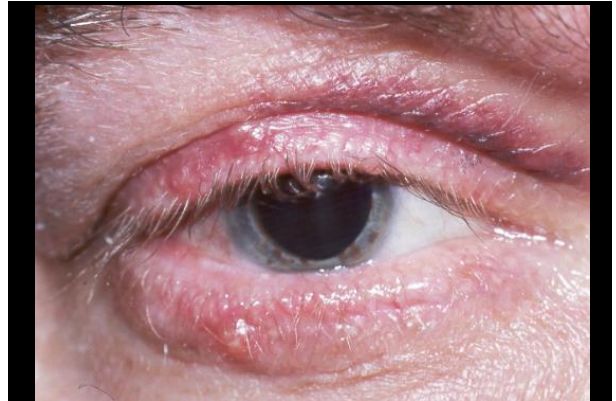


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## Styes and Chalazia

- Stye is inflammation of lash follicle or surrounding glands
- Chalazion is chronic swelling of meibomian gland
  - No pain
  - No gross inflammatory signs

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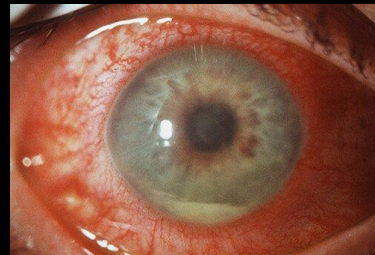


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## Iritis

- Circumcorneal injection
- AC reaction
- Blurred vision
- Moderate pain
- Photophobia
- No discharge
- Miotic pupil in affected eye
- Normal or elevated IOP

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## Cell and Flare



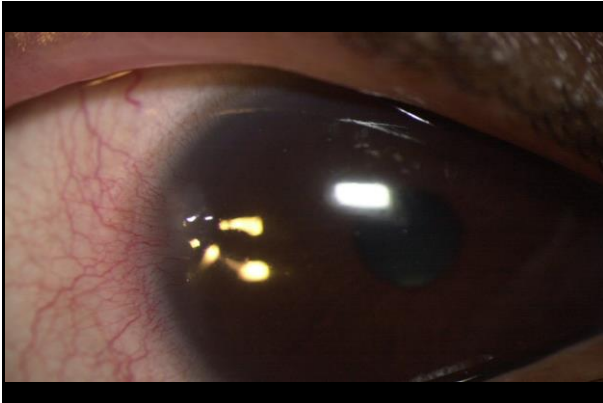
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## Episcleritis

- Localized inflammation of superficial scleral tissue
- Purplish injection, especially at canthi
- Pain on movement
- Deep pain, especially at night
- May indicate serious eye or systemic problem

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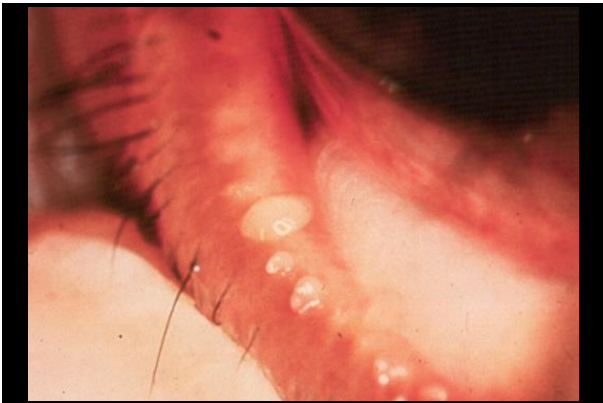




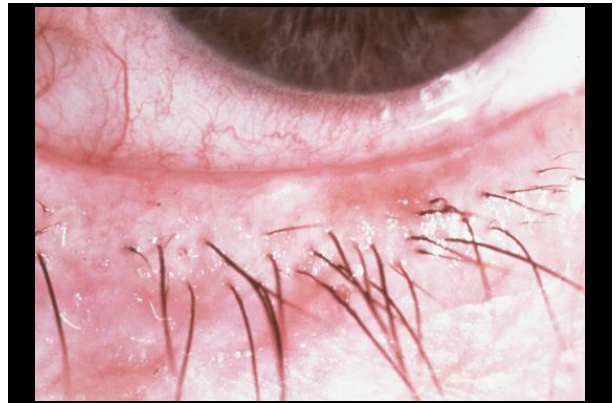
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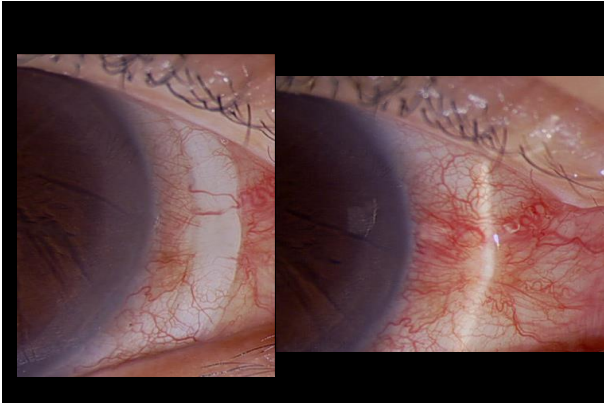
## Pinguecula

- Small yellowish-white elevated tissue mass
- On nasal or temporal bulbar conjunctiva
- Can become irritated from CL edge, irritation, dryness
- If lens related, modify GP / scleral lens parameters

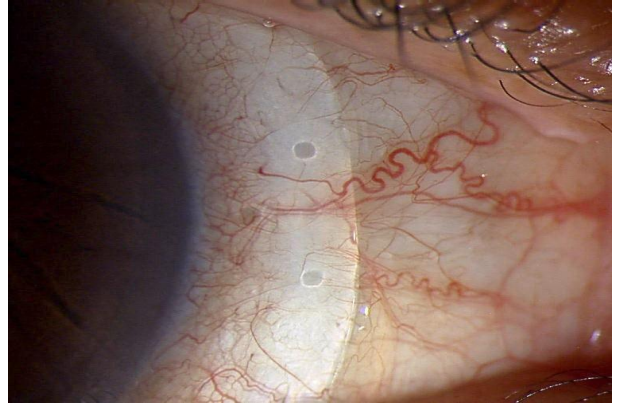
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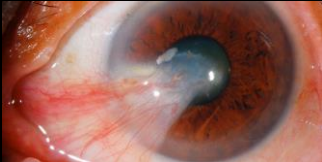
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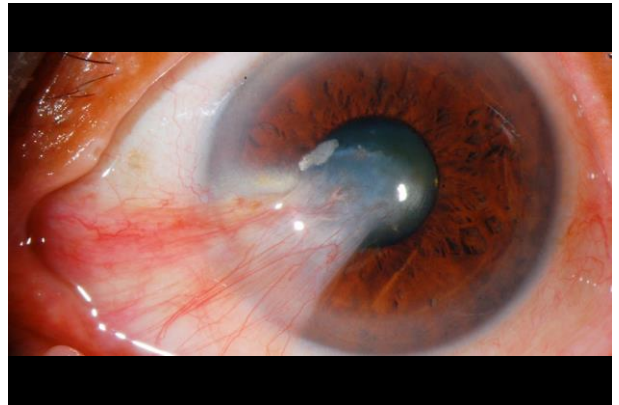
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**Pterygium**

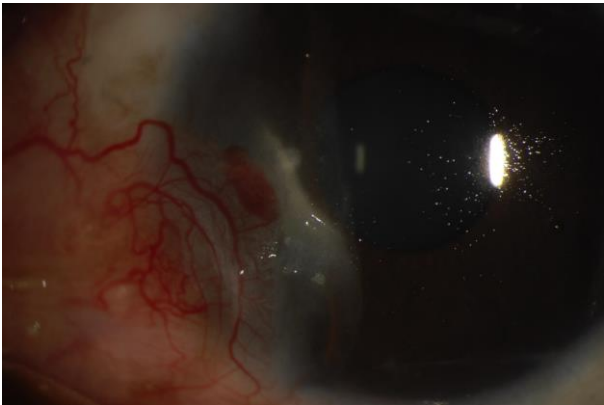
- Wing like growth of fibrovascular tissue
- Extend from the bulbar conjunctiva onto the cornea



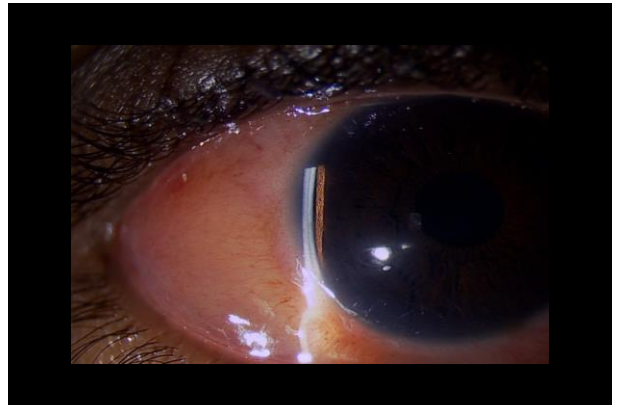
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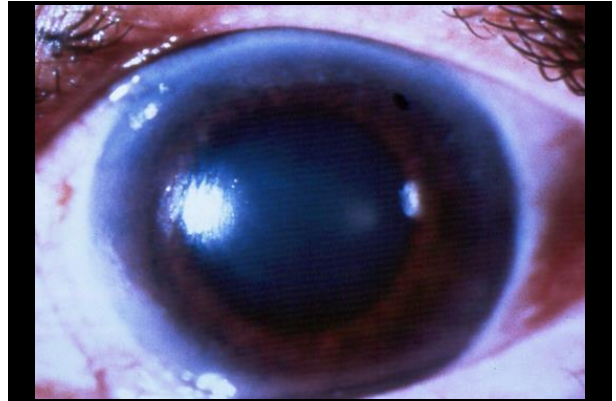
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## Angle Closure Glaucoma

- Red eye
- Marked blurring of vision
- Rainbows around lights
- Intense pain
- Partially-dilated oval pupil
- Cloudy cornea
- Elevated IOP
- Refer immediately as acute emergency

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## Non-CL Related Acute Emergencies

- Lid lacerations
- Hyphema
- Blunt trauma
  - Blowout fracture
  - Hematoma
  - Hyphema
  - Retinal detachment
- Sudden onset of double vision in adults

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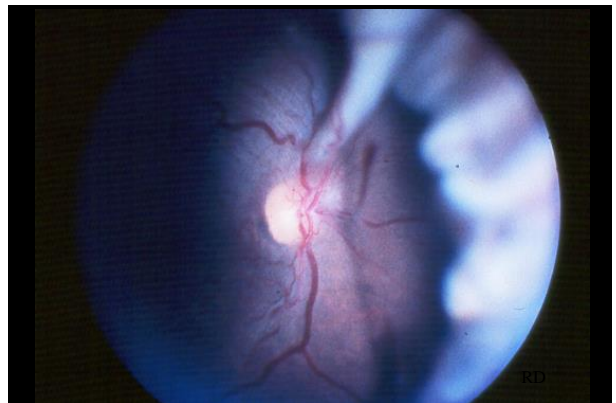


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## Retinal Detachment Symptoms

- Flashes of light
- Ascending veil or curtain
- Sudden loss of vision
- Serious, needs immediate referral

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## Vitreous Detachment Symptoms

- Flashes of light
- Floaters (new floater)
- Traction of retina
- Can result in retinal detachment but not generally serious

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## Spectacle Blur

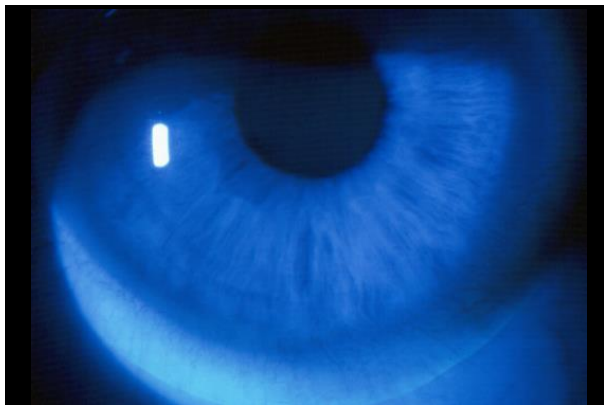
- Blur and distortion after contact lens removal
- Corneal edema
  - Mechanical molding
  - Combination of edema and molding
  - Can occur with any contact lens

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## Scleral Indentation

- Compression of lens edge on sclera
- Possibly tight lens
  - Possibly thick edge
  - Soft or scleral lens

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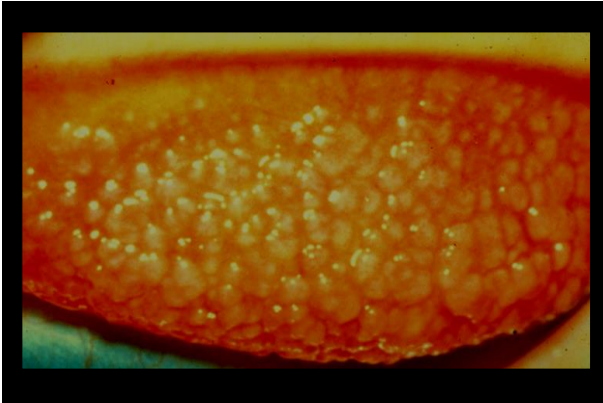


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## Lens Dislocation

- Possibly GPC
- Possibly inside out lens
- Possibly dirty lens
- Possibly poor fitting lens
- Deep set eye

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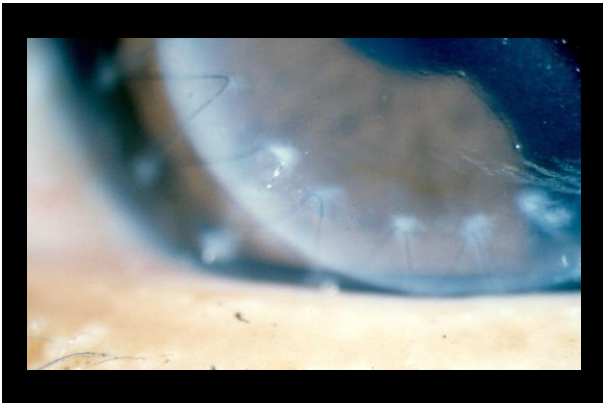
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## The Average Eyelid...

- Blinks per Minute  
12.55
- Blinks per Year  
4,397,520
- Distance Traveled  
Per Blink = 8.5mm
- Distance Traveled  
Per Year = 46.5 miles

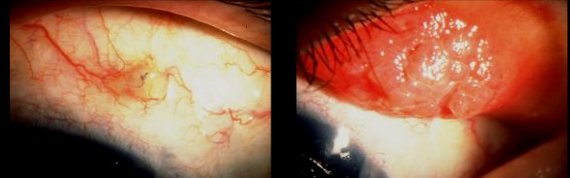


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## Mechanical GPC



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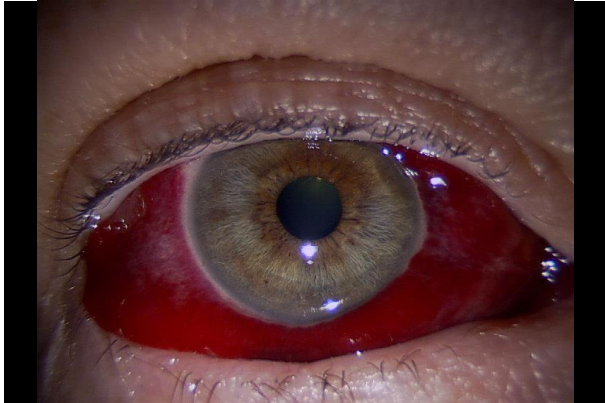


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## Sub-Conjunctival Hemorrhage

- Possibly insertion or removal trauma
- Patients often on a blood thinner (ASA, etc.)
- Possibly spontaneous
- Possibly coughing spell or retching
- Possibly high blood pressure

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## Ptosis

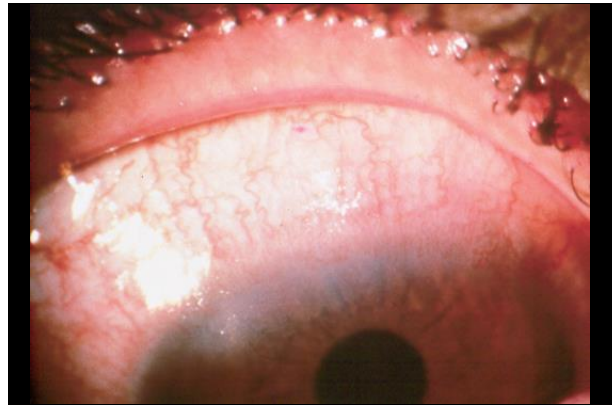
- Long term rigid lens wear
- CN III
- Can be serious neurological problem

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## Lens Discomfort

- Dry eyes
- Damaged lenses
- Inverted lenses
- Soiled lenses
- Poor fit

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## Lens Discomfort

- Solution sensitivity
- Foreign body under or embedded in lens
- Allergies
- Adverse environmental conditions
- GPC

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## The Routine Case

- Decreased wear time
- Change in near or distance vision
- Fluctuations in vision
- Ghosting
- Lid twitches
- Lost or damaged lenses
- Review care system and meds

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Thank you for your attention

Questions?

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