

# COMMON EYE PROBLEMS: WHEN TO TREAT, WHEN TO REFER

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**Nevada Chapter**

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# Learning Objectives

At the conclusion of the presentation, participants should be able to:

1. Understand what ocular disorders can be treated and when they should be referred.
2. Understand what conditions can cause red eye and how to make the correct diagnosis.
3. Understand what potential treatments for ocular disorders can worsen the problem.

# Learning points:

1. Use the appropriate antibiotic and at the approved regimen for the treatment of bacterial conjunctivitis.
2. Refer earlier to an ophthalmologist for keratoconjunctivitis.
3. Check for concomitant otitis, pharyngitis and preauricular adenopathy in the evaluation of the red eye.



# References

For more information on this subject, see the following publications:

Reference A [https://eyewiki.org/Main\\_Page](https://eyewiki.org/Main_Page)

Reference B <https://www.aapos.org/patient/eye-terms>

# Case presentations with discussion.

- Red Eye
  - Conjunctivitis
  - Foreign body / Trauma
  - Cellulitis, preseptal vs orbital
- Miscellaneous cases



# A 6-year-old presents to your office with a red eye. What is the most important element of your examination?

1. History
2. General Examination
3. Ocular examination
4. None of the above (Have your MA Epic in a Rx for an antibiotic eye drop without examining the child)
5. 1, 2, and 3

# All red eye is conjunctivitis.

1.True

2. False



# What is Red eye or Pink eye?

It is a descriptive term and does not give the diagnosis

It is the job of the provider to determine the cause and give the appropriate treatment

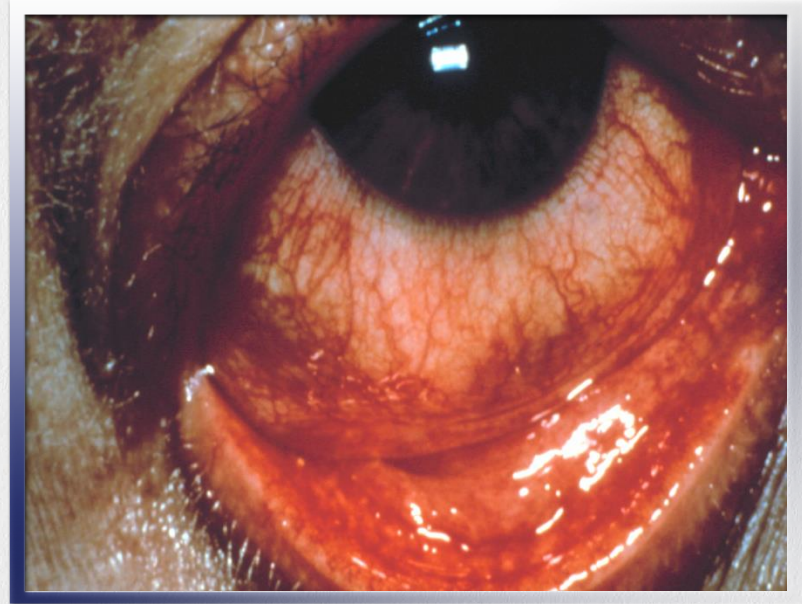


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# What are the potential causes of Red eye?

Conjunctivitis

Bacterial

Allergic

Viral

Chemical

Foreign body / trauma

Uveitis

Orbital Cellulitis

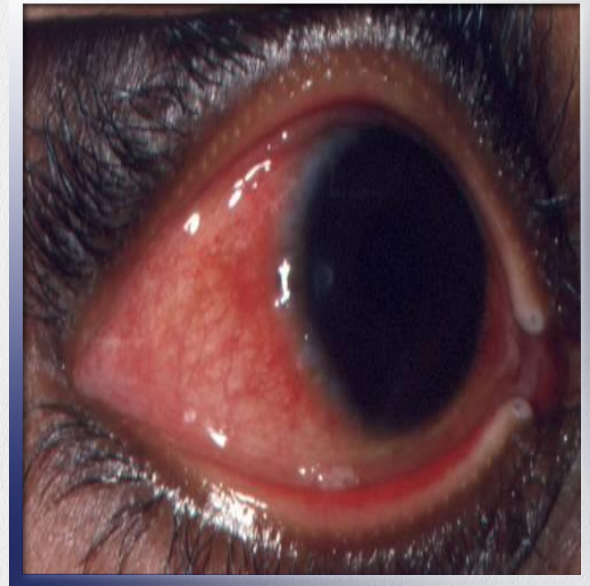


Photo © 2002 Robert D. Gross, MBA, MD.



# Symptoms history can be important

Itching – allergy

Scratching – foreign body or dry eye

Localized tenderness – styne or chalazion

Deep intense pain and photophobia – iritis

Halo vision – corneal edema

# Physical examination

Unilateral or bilateral

Eyelid involvement

Localized or diffuse redness

Discharge: watery or mucopurulent

Vision

Cornea

Pupils

Red reflex





# Opportunities

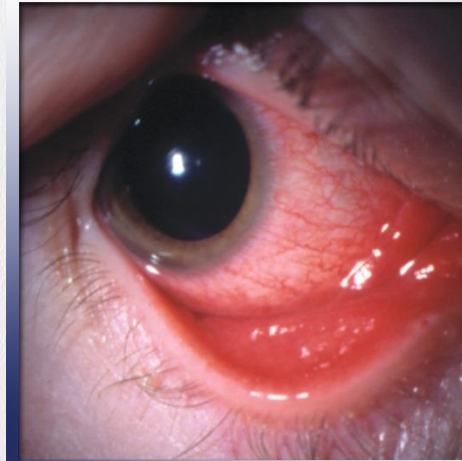
Prompt diagnosis

Optimal intervention

Rapid relief

Lower costs

Appreciative patient and family

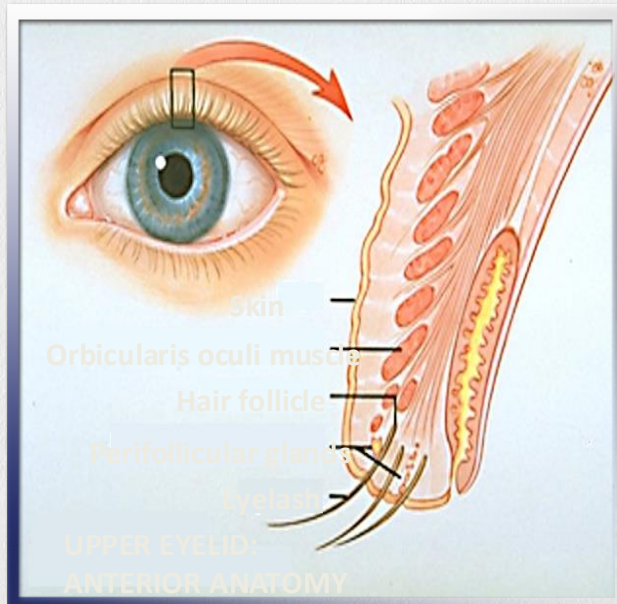


# What is the conjunctiva?

1. A pesky embryonic mucus membrane remnant that has no redeeming value like the appendix
2. The clear part of the eye that you see through
3. A protective covering of the eye that has a palpebral and bulbar component that prevents contact lenses from slipping behind the eye and into the brain



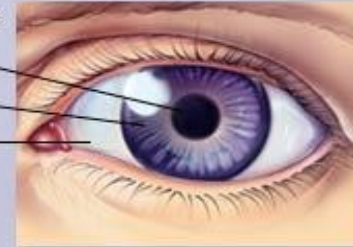
# Conjunctiva anatomy



## Conjunctivitis

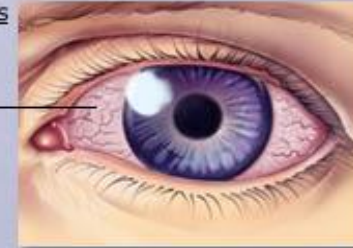
### Normal eye

Pupil  
Iris  
Conjunctiva



### Conjunctivitis

Inflamed conjunctiva



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# Conjunctivitis

Bacterial

Viral

Allergic

Chemical



# Pre test



# What is conjunctivitis associated with ... most likely do to?

Pharyngitis

Preauricular adenopathy

Whitish mucoid discharge

1. Viral

2. Bacterial

3. Allergic

4. Chemical

5. Who cares I treat them all the same anyway!





# What is conjunctivitis associated with ... most likely do to?

Otitis

Sinusitis

Purulent, yellow green discharge

1. Viral

2. Bacterial

3. Allergic

4. Chemical

5. Who cares I treat them all the same anyway!



# What is conjunctivitis associated with ... most likely do to?

Itching

Stringy, clear discharge

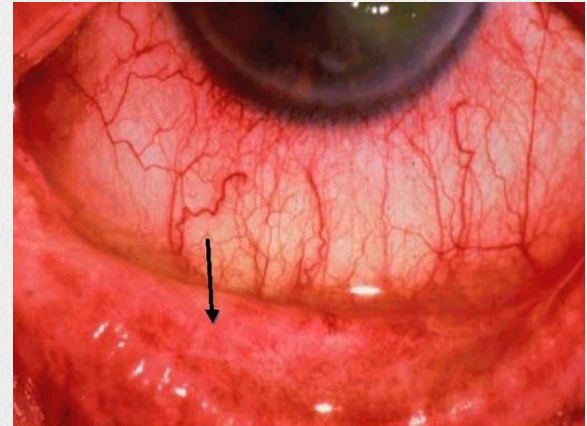
1. Viral

2. Bacterial

3. Allergic

4. Chemical

5. Who cares I treat them all the same anyway!

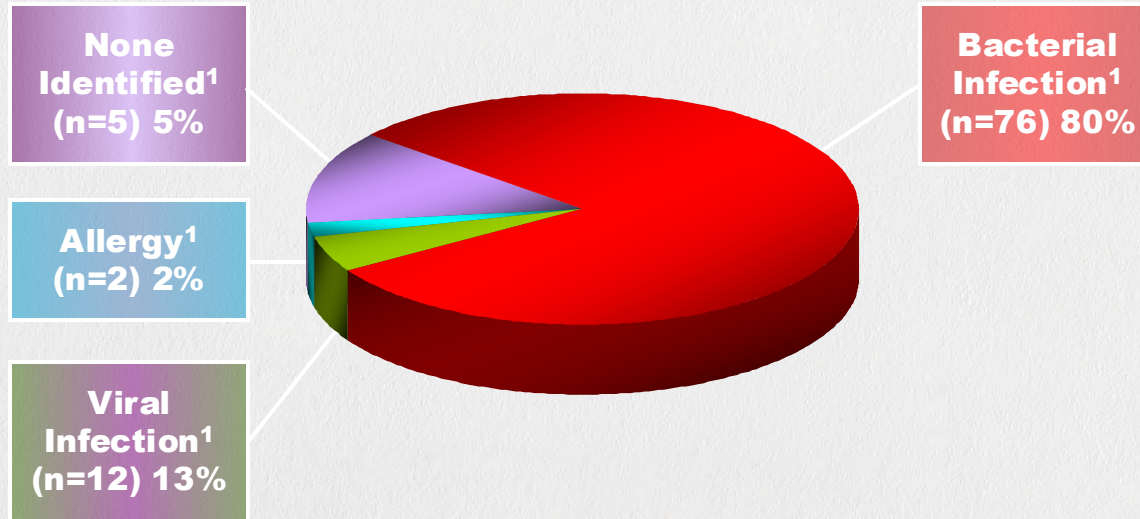




# What is the major cause of conjunctivitis presenting to the primary care pediatrician?

1. Viral
2. Bacterial
3. Allergic
4. Chemical
5. Who cares I treat them all the same anyway!

# Causes of pediatric acute conjunctivitis



Weiss A, et al. *J Pediatr*. 1993;122:10-14.

Isenberg SJ, et al. *Am J Ophthalmol*. 2002;134:681-688.



# What is conjunctivitis associated with ... most likely do to?

Otitis

Sinusitis

Purulent, yellow green discharge

1. Viral

2. Bacterial

3. Allergic

4. Chemical

5. Who cares I treat them all the same anyway!



# Bacterial conjunctivitis is associated with ...

Otitis

Sinusitis

Purulent, yellow green discharge





# Bacterial conjunctivitis

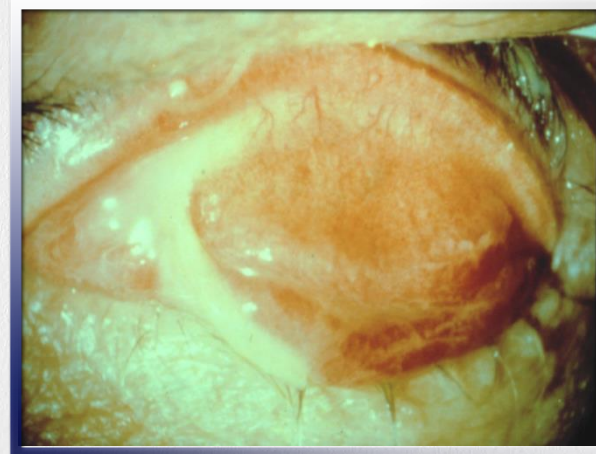
Usually occurs in pre school aged children

Bilateral, but can be unilateral

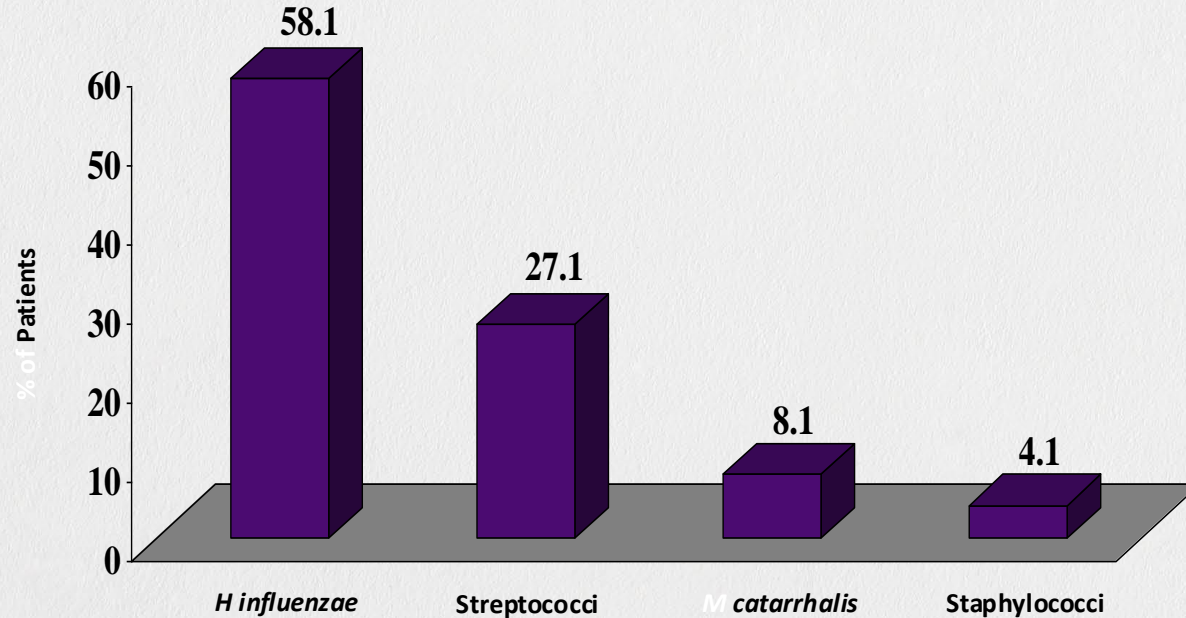
Mucopurulent discharge with matting

May be associated with otitis

Can be highly contagious



# Ocular pathogens in bacterial conjunctivitis



Weiss A, et al. *J Pediatr*. 1993;122:10-14

Buznach, et al. *Pediatr Infect Dis J* 2005;24:823-828

Hu Y-L, et al. *Sci Rep* 2021;11:11



# What is the treatment of bacterial conjunctivitis?

1. Topical antibiotics
2. Lid Hygiene
3. Do nothing
4. All of the above

# Can you do nothing?

Yes, the vast majority are self limiting lasting 7 to 10 days

But achieving an early cure of bacterial conjunctivitis has important implications

- reducing contagium

- improving the patient's quality of life

- early return to school or work

- early identification of masquerade diseases

American Academy of Ophthalmology. *Preferred Practice Pattern: Conjunctivitis*. 1998;9.

Gigliotti F. *Pediatr Ann*. 1993;22:353-356.

Gigliotti F, et al. *J Pediatr*. 1984;104:623-626.

Lohr JA, et al. *Pediatr Infect Dis J*. 1988;7:626-629.

Jackson WB, et al. *Can J Ophthalmol*. 1982;17:153-156.



# Maine Elementary School Epidemic 2002

101 Cases including teachers and family members

Itching, pain and burning with grey or yellow discharge

Lid swelling

Non-encapsulated Strep Pneumoniae

Resistant to Erythromycin

MMWR 2003;52:64-66



# Other studies confirming antibiotic resistance in bacterial conjunctivitis

60% PCN resistance in Strep Pneumoniae isolates

12% non-typable Strep Pneumoniae

PCV-7 vaccine only covered 44% of isolates

50% clustered in households

70% H Influenzae

80% resistance to ampicillin

18% resistance to amoxicillin-clavulanate

11% resistance to 2<sup>nd</sup> and 3<sup>rd</sup> gen cephalosporin

Buznach, et al. *Pediatr Infect Dis J* 2005;24:823-828

Hu Y-L, et al. *Sci Rep* 2021;11:11



# Ophthalmic antibiotics available

Sulfacetamide

Bacitracin (ung)

Polysporin® (ung)

- Polymyxin B/Bacitracin

Neosporin®

- Polymyxin B/Bacitracin
- Neomycin

Achromycin®

- Tetracycline

Chloroptic®

- Chloramphenicol

Ilotycin® (ung)

- Erythromycin

Genoptic®

- Gentamicin

Tobrex®

- Tobramycin

Polytrim®

- Polymyxin B/Trimethoprim

Chibroxin®

- Norfloxacin

Ciloxan®

- Ciprofloxacin

Ocuflox®

- Ofloxacin

Quixin®

- Levofloxacin

Vigamox™

- Moxifloxacin

Zymar™

- Gatifloxacin

Besivanvce

Besifloxacin

# Problem with using bacteriostatic antibiotic

Must use according to dosage guideline

Greater degree of developing resistance if not used appropriately

Erythromycin ¼ inch 6 times per day

Polymyxin B/Trimethoprim one drop every 3 hours for 7 to 10 days



# Bactericidal antibiotic

Fluroquinolone

Less resistance

Also covers Chlamydia Trachomatous and Moraxella

Moxifloxacin – 1 drop 2 to 3 x per day for 7 days

Others – 1 drop q 2 hrs x 24 hrs then 2 to 4 times per day for days 2 – 7 days (corneal ulcer dosing)

# What is conjunctivitis associated with ... most likely do to?

Pharyngitis

Preauricular adenopathy

Whitish mucoid discharge

1. Viral

2. Bacterial

3. Allergic

4. Chemical

5. Who cares I treat them all the same anyway!





# Viral conjunctivitis is associated with ...

Pharyngitis

Preauricular adenopathy

Whitish mucoid discharge



# Viral Conjunctivitis

Usually affects older children

Often begins in one eye then the other eye becomes involved

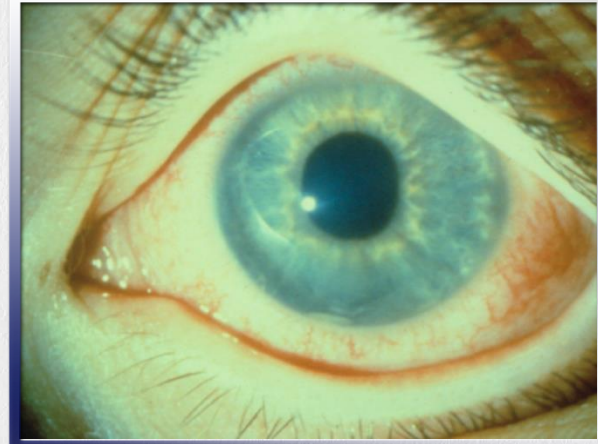
May be associated with pharyngitis

Associated with preauricular and / or submandibular adenopathy.

Risk of transmission 10 to 50%

Adenovirus

Incubation 5-12 days, communicability 10-14 days





# Viral Conjunctivitis Types

Follicular conjunctivitis

Acute hemorrhagic conjunctivitis

Pharyngoconjunctival fever

- High fevers

- Pharyngitis

- Concomitant bacterial conjunctivitis

- Preauricular lymph node involvement



# Viral Conjunctivitis Types

## Epidemic keratoconjunctivitis

Adenovirus subtypes 8, 4, 19, 37, and 64

Subepithelial infiltrates develop at day 10

reduced acuity

may persist for months

can cause permanent vision loss

urgent referral to ophthalmologist

highly contagious





# Viral Conjunctivitis

## Treatment

supportive

cold / cool compress

topical antibiotic if concomitant bacterial conjunctivitis

artificial tears / topical antihistamine mast cell stabilizer

corticosteroids if EKC under supervision of ophthalmologist

## Notes to household

compulsive cleaning of surfaces

no sharing of towels, utensils etc.

# These children present with eye rubbing and itching. What is the most likely diagnosis?

1. Bacterial conjunctivitis
2. Viral conjunctivitis
3. Allergic conjunctivitis
4. Chemical conjunctivitis





# What is conjunctivitis associated with ... most likely do to?

Itching

Stringy, clear discharge

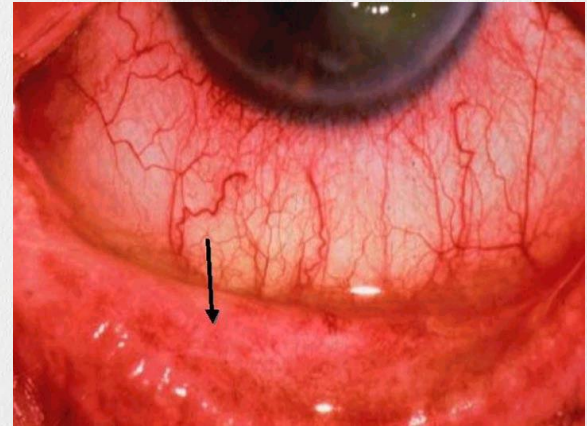
1. Viral

2. Bacterial

3. Allergic

4. Chemical

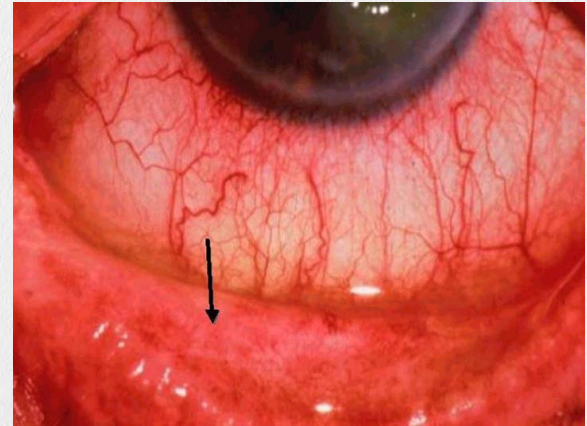
5. Who cares I treat them all the same anyway!



# Allergic conjunctivitis is associated with ...

Itching

Stringy, clear discharge





# Allergic Conjunctivitis

## Important questions

taking over the counter allergy medications?

taking over the counter eye drops?

taking intranasal steroids?

history of asthma?

history of atopy or eczema?

# Allergic conjunctivitis

## Symptom

itching

stringy discharge

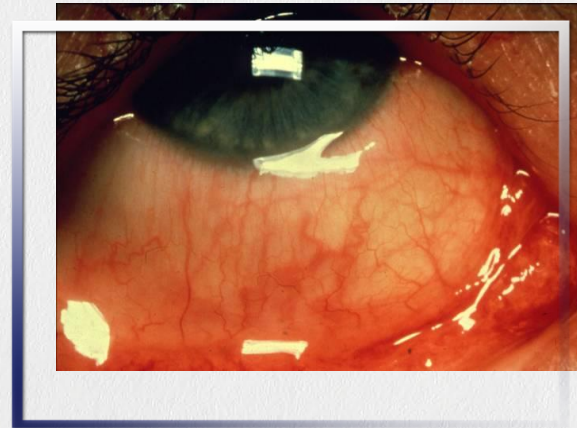
## Signs

lid edema

hyperemia

chemosis

tearing





# What are the types of ocular allergy?

1. Seasonal/perennial allergic conjunctivitis
2. Vernal keratoconjunctivitis (VKC)
3. Atopic keratoconjunctivitis
4. Giant papillary conjunctivitis (GPC)
5. 1 only
6. 1, 2, 3, and 4

# Seasonal allergic conjunctivitis

Itching is the predominate symptom

Lid or conjunctival edema

Watery discharge and white stringy mucus

Associated with hay fever, asthma, and eczema

Occurs during time of year with pollen and outdoor mold

Contact allergy with drugs, chemical, cosmetics





# Perennial allergic conjunctivitis

## Causes

indoor molds

cockroaches

dust mites

pet dander



# Atopic keratoconjunctivitis

Associated with atopic dermatitis

May be perennial

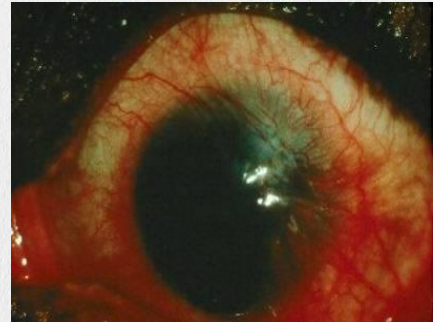
Genetic predisposition

Exacerbated by environment allergens

excessive heat, wildfire smoke, fossil fuel pollution

Can develop keratopathy and corneal neovascularization

emergent referral to ophthalmology





# Vernal keratoconjunctivitis

Genetic predisposition / atopy IgE

Hot weather and seasonal perennial allergens

Ropy mucus discharge

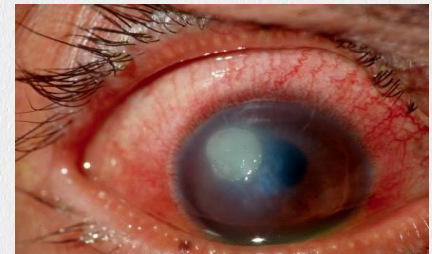
Cobblestone papillae

Trantus dots / limbal nodules “fish eggs”

degenerated epithelial cells and eosinophils

Limbal neovascularization

Shield ulcer



# Giant papillary conjunctivitis (GPC)

Caused by repeated mechanical irritation

contact lenses

ocular foreign body

Aggravated by concomitant allergy

Can also aggravate ocular allergy





# What are Conjunctival mast cells are most similar to?

1. Tryptase containing mast cells of the lungs
2. Tryptase containing mast cells if the nasal mucosa
3. Tryptase / chymase mast cells of the skin and connective tissue
4. 1 and 2

# Distribution of Human T and TC Mast Cells

Location	% T	% TC
Skin	12	88
Lung	99	1
Nasal mucosa epithelium	100	0
Conjunctiva	0	100



# Pharmacological management of allergic conjunctivitis includes all the following

1. Antihistamines
2. Antihistamine / vasoconstrictor combinations
3. Mast cell stabilizer
4. Antihistamine / mast cell stabilizer
5. Steroids
6. Nonsteroidal (NSAIDS)
7. Cyclosporine

# What is the most common treatment?

## Antihistamine/ decongestant combinations

Naphazoline/ Pheniramine  
(Naphcon-A®, Opcon-A®,  
OcuHist®)

## Topical antihistamines

Levocabastine (Livostin™)  
Emedastine (Emadine™)

## Antihistamine/ mast cell stabilizers,

Olopatadine (Patanol®) Ketotifen  
(Zaditor™, Alaway) Azelastine  
(Optivar™)

## Mast cell stabilizers

Nedocromil (Alocril™) Pemirolast  
(Alamast™) Lodoxamide  
(Alomide®), Cromolyn (Crolom®,  
Opticrom®)

## Corticosteroids

Loteprednol 0.2% (Alrex®)  
Fluorometholone  
Prednisolone Rimexolone  
(Vexol®)  
Loteprednol 0.5% (Lotemax)

## Cyclosporine

.05% (Restasis)  
0.1% (Verkazia)



The background features a light blue sky with three watercolor-style clouds in shades of blue and white. A bright yellow sun with orange rays is positioned in the top right corner. The text is centered in a bold, orange, sans-serif font.

**MOST PATIENTS USE OR  
ARE TOLD TO USE BY THEIR  
PROVIDER AN OTC  
PRODUCT FOR OCULAR  
ALLERGY**

# Antihistamine/ decongestant combinations, Naphazoline/ Pheniramine are bad!

Naphcon-A, Opcon-A, OcuHist, Visine-A

## Naphazoline

- sympathomimetic vasoconstrictor
- rebound vasodilation
- pupil dilation leading to blurry vision
- central nervous system depression in infants and children

## Pheniramine

- short acting antihistamine
- dosed every three to four hours



# Olopatadine and ketotifen

Antihistamine mast cell stabilizer

Olopatidine - tryptase / chymase mast cell

Twice per day

(Patanol, Alaway, Zaditor)

Higher concentration olopatadine (Pataday) once per day

# Cromolyn sodium

Mast cell stabilizer

Can take 7 to 10 days to see an effect

Good to use long term

May need to supplemented initially with another medication



# Steroids

can be safe short term

Loteprednol 0.2% (Alrex) marketed for ocular allergy

Prednisolone acetate 1%

transition to cromolyn or cyclosporine in atopic or vernal keratoconjunctivitis

beware of treating HSV

long term complications include glaucoma and cataracts

# Cyclosporine

0.05% (Restasis) used for dry eye

0.1% (Verkazia) approved for vernal keratoconjunctivitis



# A child presents with HSV involving the lids. Corneal stain shows dendrites. What should you do?

1. Treat with topical antibiotics
2. Treat with topical steroids
3. Treat with topical antivirals
4. Refer immediately and begin oral antivirals
5. No treatment is needed since this will resolve over time



# HSV keratoconjunctivitis

Dendrite – epithelialitis

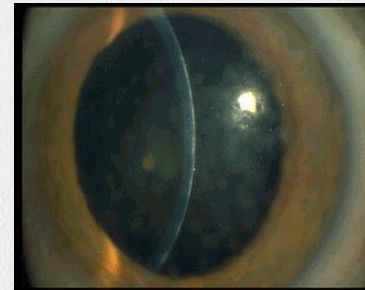
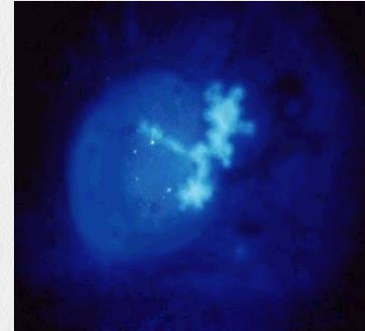
oral antiviral

Stromal – endotheliitis

oral antiviral

topical steroid

May need prophylactic antivirals





**A child was playing under the sink and got splashed in the eye with an unknown liquid. The mother calls you on the phone. What should you do?**

1. Tell the mother to let the child continue playing
2. Send them to the nearest emergency room for immediate irrigation and instruct them to bring the bottle
3. Refer to an ophthalmologist at the next available appointment

# Chemical Conjunctivitis / Injury

## Acid

less harmful than alkali

denature and precipitate proteins

coagulated proteins act as a barrier to  
prevent further penetration





# Chemical conjunctivitis / injury

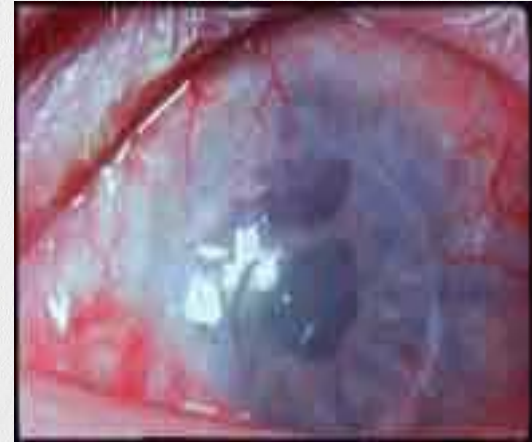
## Alkali

lipophilic and penetrate tissue

saponify the fatty acids of cell  
membranes

penetrate the corneal stroma and  
destroy proteoglycan ground  
substance and collagen bundles

destroys limbal stem cells



# An 11-month-old presents with recurrent morning discharge despite treatment with erythromycin and polytrim. What do you advise?

1. begin a course of a topical fluoroquinolone
2. begin oral acyclovir
3. obtain an MRI
4. wipe off the discharge and return next month
5. See a pediatric ophthalmologist for nasolacrimal duct probing



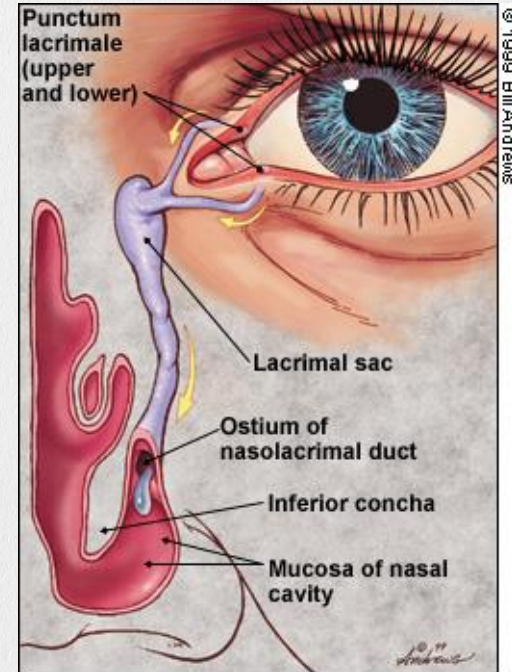


# Nasolacrimal duct obstruction

Blockage at valve of Hasner at the end of the duct

Occurs in 5-10 % of normal newborn infants

90% spontaneous resolution within the first year of life



# Nasolacrimal duct obstruction

## Management

lacrimal massage

topical antibiotics if secondary infection

probing if no resolution by one year of age





# What does the evaluation and treatment of this lesion include?

1. MRI to rule out intracranial spread
2. Warm compress
3. Biopsy and node dissection
4. Oral antibiotics
5. 1 and 3
6. 2 and 4



# Stye or Chalazion

Stye – involvement eyelash follicle

Chalazion – involvement of meibomian gland

Treatment

- warm compresses

- lid hygiene

- topical antibiotics

- oral antibiotics if preseptal component

- incision and drainage

- oral omega 3 fatty acids if recurrent and multiple



**This child with a URI and cough presents to your office. Visual acuity is normal. What should you do?**

1. refer immediately
2. rule out coagulopathy
3. reassure parents that this will resolve spontaneously
4. prescribe topical antibiotics
5. patch



# Subconjunctival hemorrhage

Bleeding of small conjunctival vessels

Occurs because of increased pressure from sneezing, coughing, vomiting or excessive eye rubbing

Aspirin or anticoagulation is risk factor

Generally, resorbs within two weeks

If eye irritation can use artificial tears or antihistamine / mast cell stabilizer combo.



# A 16-year-old presents with this lesion while removing a contact lens. What would treatment include?

1. Topical antibiotics and patch
2. Immediate referral to an ophthalmologist
3. Topical antibiotics
4. Oral antibiotics
5. Corneal transplantation



# Corneal abrasion

Fluorescein dye can demonstrate the lesion / use with topical anesthetic

Accounts for 10% of emergency room visits

Never patch a contact lens wearer because of colonization with pseudomonas

Topical antibiotic recommended – ointment in children

Child heal very quickly, often within 24 hours

Never send home with topical anesthetic because of corneal toxicity



**This teen shared a cosmetic contact lens with school friends. What diagnosis do you give when you call the ophthalmologist?**

1. Hyphema
2. Hypopyon
3. Corneal abrasion
4. Conjunctivitis
5. Iritis



# Hypopyon

Infectious and/or inflammatory material layering in the anterior chamber

## Etiologies

- spread from infectious corneal ulcer

- systemic infections: syphilis, toxoplasmosis, TB, Toxocara

- non-infectious: Bechet's, sarcoid, lymphoma

## Immediate referral to ophthalmologist

- infectious: injection and topical antibiotics, systemic antibiotics

- non-infectious: etiology dependent





**This child has photophobia, circumcorneal redness, and decreased vision. Work up should include what testing?**

1. ANA
2. Rheumatoid factor
3. Chest x-ray
4. ACE
5. GI work up
6. None of the above



# Iritis

Photophobia and perilimbal redness can be a sign of iritis

Inflammatory material can precipitate on the back of the cornea (keratoprecipitate)

Most likely cause in children is JIA (Juvenile idiopathic arthritis)

Obtain an ANA





# A 12 yo was stung by a bee and has significant lid swelling. What do you do next?

1. Prescribe an antihistamine
2. Prescribe an oral antibiotic
3. Apply cool compresses
4. Admit to the hospital emergently for CT scan and intravenous antibiotics



**Lift the lid and check vision and motility**





# Orbital cellulitis

Contiguous spread of infection from sinus into orbit

Infection can spread into optic nerve

CT scan shows sinus opacification and  
subperiosteal abscess

Treatment

- IV antibiotics

- Possible sinus surgery

- Possible drainage of subperiosteal abscess





**THANK YOU FOR YOUR  
ATTENTION!**

**QUESTIONS?**