The Pediatric Red Eye:
When its not just Allergic Conjunctivitis

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Disclosures

- I have no financial disclosures

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Lecture Objectives

Describe differential diagnosis of red eye in a pediatric patient

Review tips and tricks for pediatric exams in a comprehensive clinic

Summarize considerations for management of ocular surface disease in pediatric patients

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Differential Diagnosis of a Red Eye

- **Orbital/Intracranial**
  - Orbital Cellulitis
  - Noninfectious orbital inflammation
  - Orbital tumor
  - ***Cavernous Sinus AV Fistula***
- **Eyelids/Lacrimal System**
  - Chronic blepharitis/rosacea
  - Stye/Chalazion
  - Dacryocystitis
- **Conjunctiva**
  - Subconjunctival Hemorrhage
  - Inflamed pinguecula/pterygium
  - Conjunctivitis
    - ***Chemical/Toxic***
    - Bacterial (including Chlamydia)
    - Allergic
    - Viral
    - Contact
    - Autoimmune (SJS, etc)
- **Episclera/Sclera**
  - Episcleritis
  - Scleritis
- **Cornea**
  - ***Keratitis***
    - Herpes Simplex and Zoster
  - Foreign Body
  - Corneal Abrasion
  - ***Corneal Ulcer***
- **Intraocular Pathology**
  - Uveitis (Anterior, Intermediate, Posterior)
  - ***Acute Angle Closure Glaucoma***
  - ***Endophthalmitis***
- **Trauma**
  - ***Ruptured Globe***
  - ***Retrobulbar Hemorrhage***
  - ***Hyphema***

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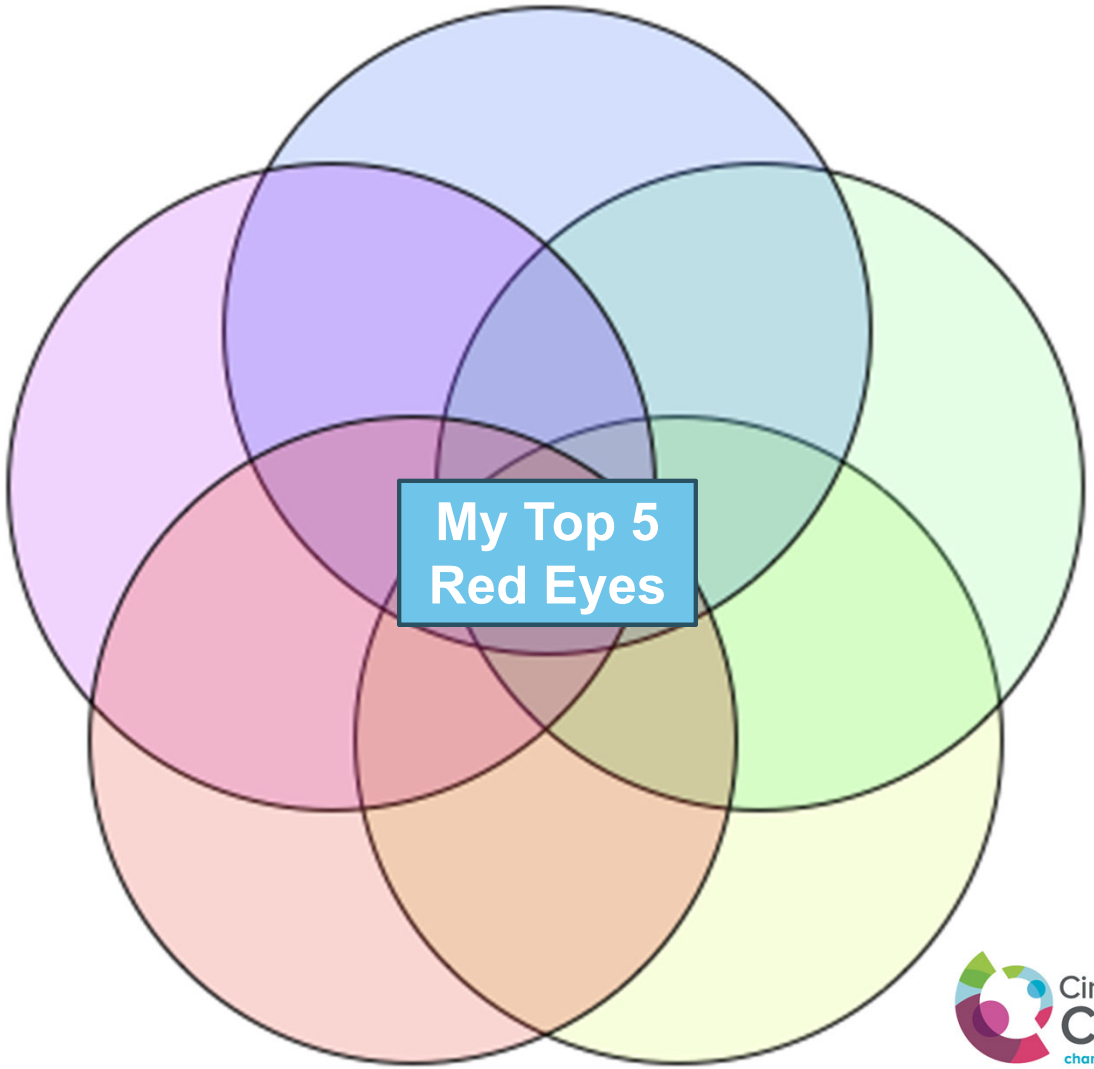
Challenges of Pediatric Diagnostics:

- Often difficult to obtain clear history of onset
- Most common causes of redness have overlapping signs and symptoms



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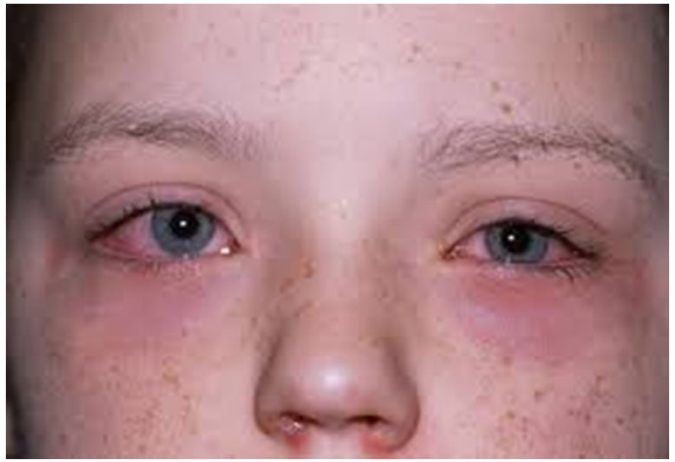
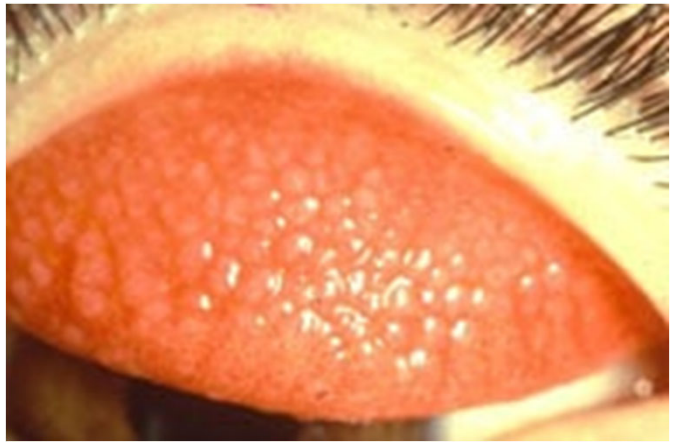
Case #1 **Allergic Conjunctivitis**

- 6yo M presenting with 3 months of bilateral itching, white stringy discharge/tearing, and eyelid irritation
- Exam: injection, conjunctival papillae (particularly UL), +/- chemosis, +/- edematous eyelids
- ASK: new pets, soaps, pattern of symptoms after being outside, seasonal pattern?
- Management:
  - Eliminate inciting agent if possible
  - Frequent washing of hair and clothes
  - Cool compresses, artificial tears, antihistamine drops +/- systemic antihistamine
  - If severe, may need short course of topical steroid to obtain initial control





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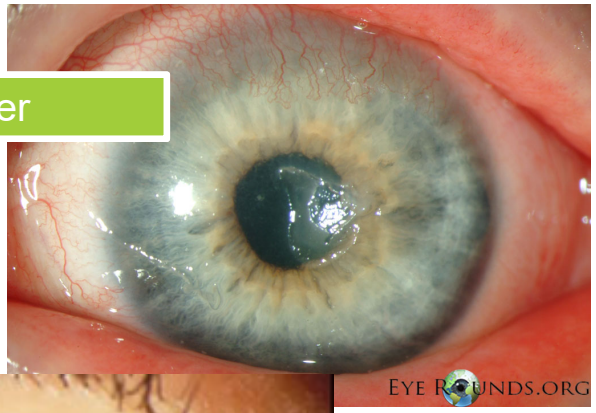
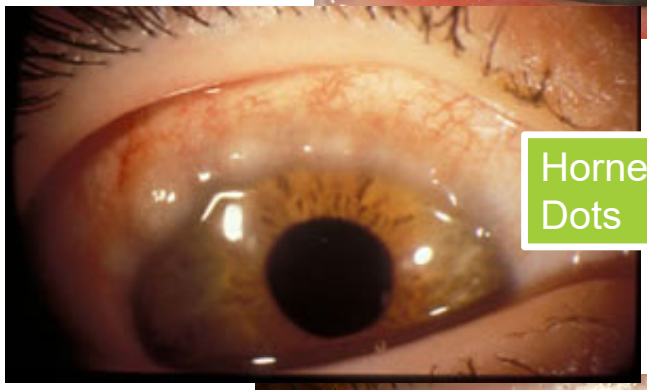
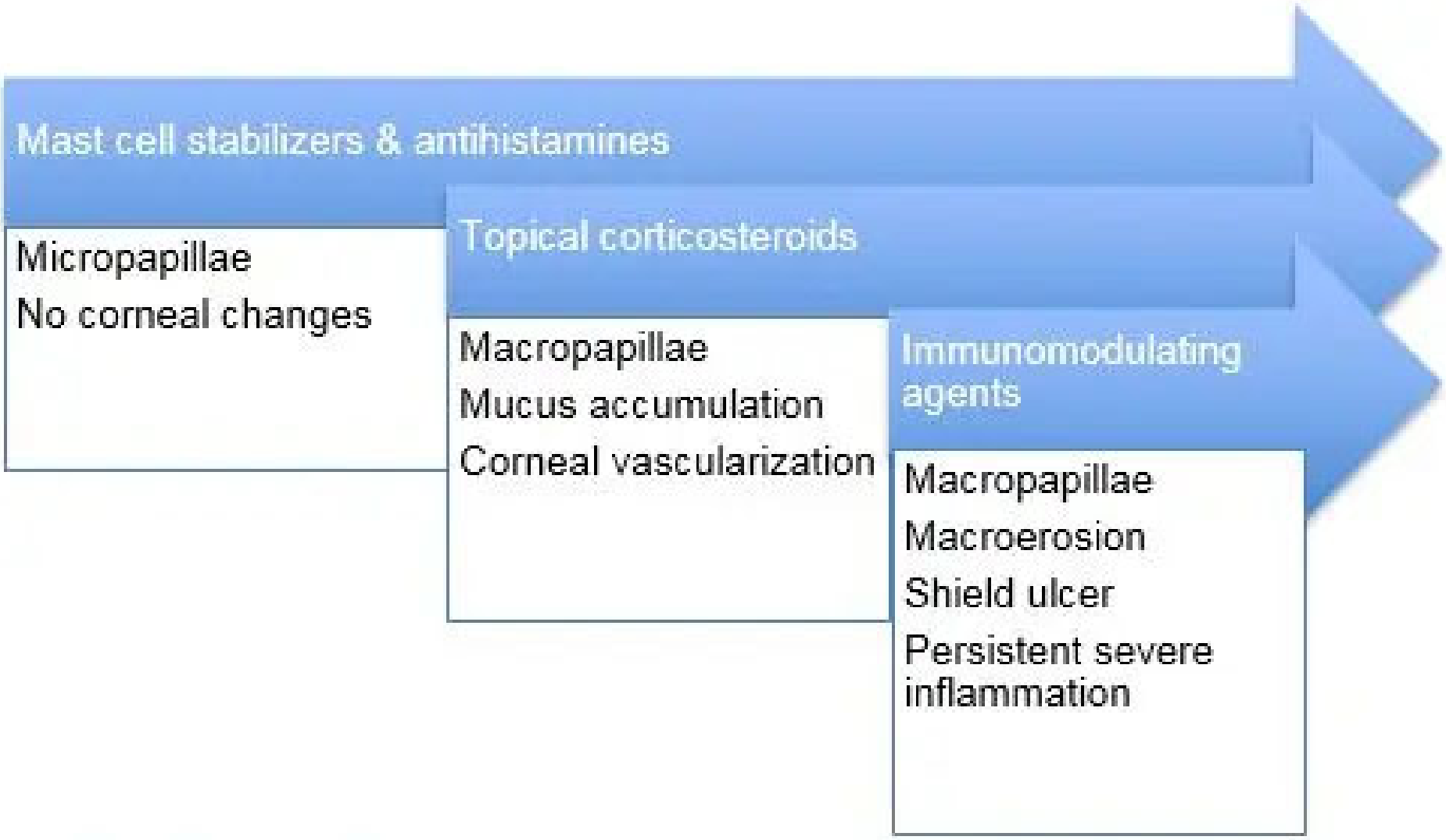
Case #2

Vernal Keratoconjunctivitis

- 8yo M presenting with severe itching, irritation, eye redness, and thick whitish discharge
- Exam: May see a central/superior corneal abrasion-like defect.
  - But make sure not to miss the superior limbus, or exam of the upper tarsus!
- Treatment is often more recalcitrant than allergic conjunctivitis, but follows similar treatment paradigms
- Beyond standard allergic management:
  - Cyclosporine A



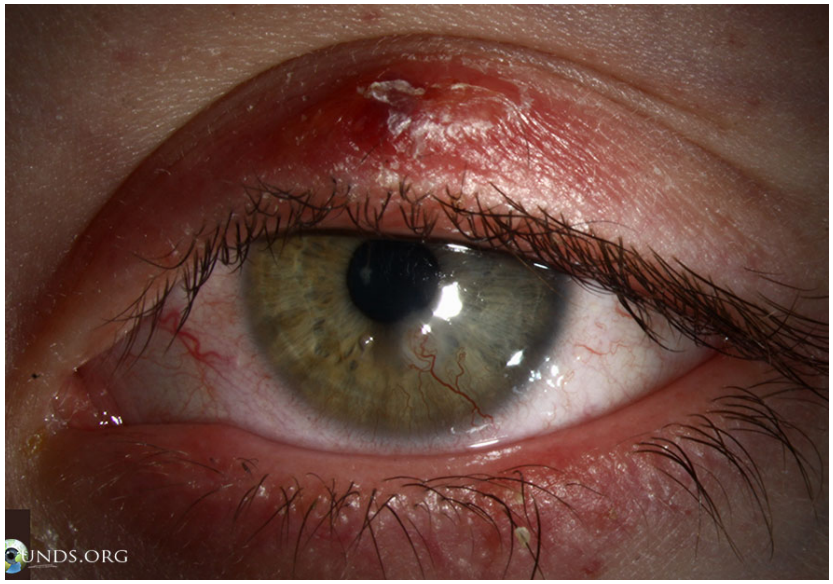



Mast cell stabilizers & antihistamines
Micropapillae
No corneal changes
Topical corticosteroids
Macropapillae
Mucus accumulation
Corneal vascularization
Immunomodulating agents
Macropapillae
Macroerosion
Shield ulcer
Persistent severe inflammation

Case #3

Blepharo-Keratoconjunctivitis

- 14yo F with recurrent chalazia, blepharitis, and now presenting with eye redness, photophobia, tearing, and blurred vision x 1 month
- Exam: Crusty, thickened, red eyelid with central chalazion, blepharitis, injection, corneal neovascularization +/- corneal infiltrate/haze
- Pediatric patients are more susceptible to corneal involvement that adult counterparts
- Evaluate for cutaneous signs of rosacea as an independent risk factor



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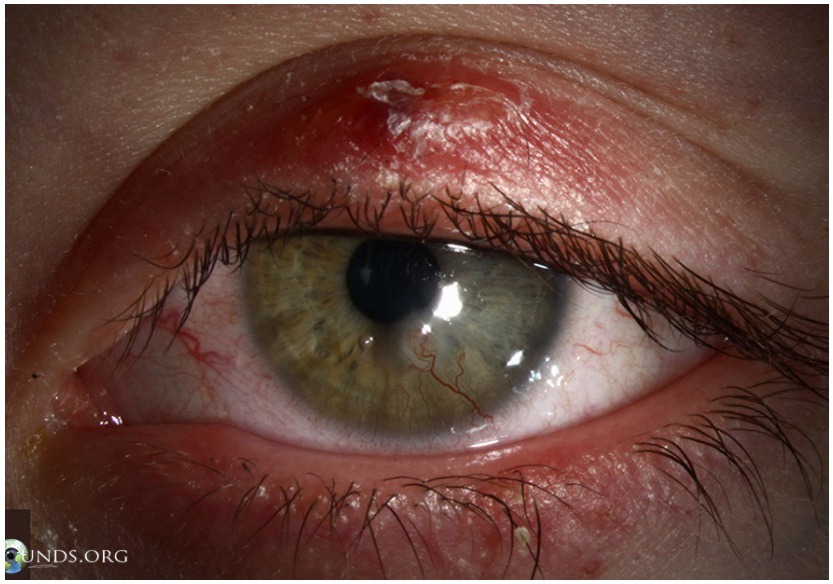
Case #3

Blepharo-Keratoconjunctivitis

- Management
  - Lid hygiene (underlying cause)
  - Address any concerns for infectious keratitis
  - Consider coverage with acyclovir or valacyclovir if cannot rule out HSV, especially if initiating topical steroid
  - Oral azithromycin or clarithromycin, especially if concurrent chalazion and blepharitis <8yo; can consider tetracyclines in children >8yo
  - Topical steroid to regress KNV; consider cyclosporine as steroid sparing
  - Erythromycin ointment to lid margins
  - Consider punctal plugs



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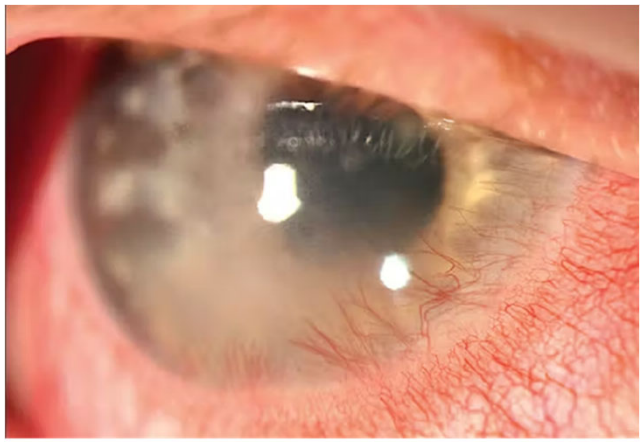
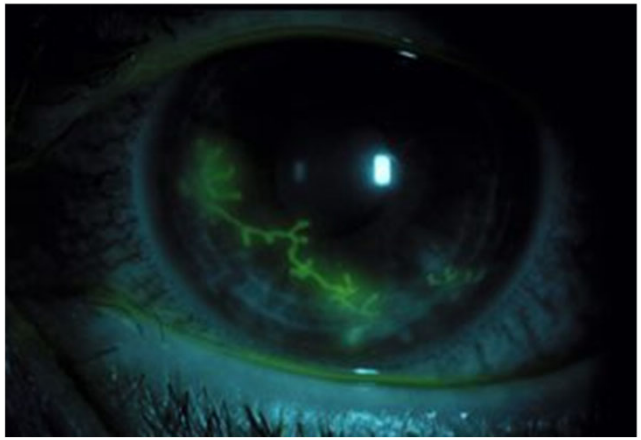
Case #4

Herpes Simplex Keratitis

- 5yo F presenting with 3 weeks of worsening redness, tearing, photophobia. Initially treated with antibiotics due to concerns for conjunctivitis.
- Exam: Right eye is injected with inferocentral corneal haze, KNV, although brief looks. You stain the eye with fluorescein…





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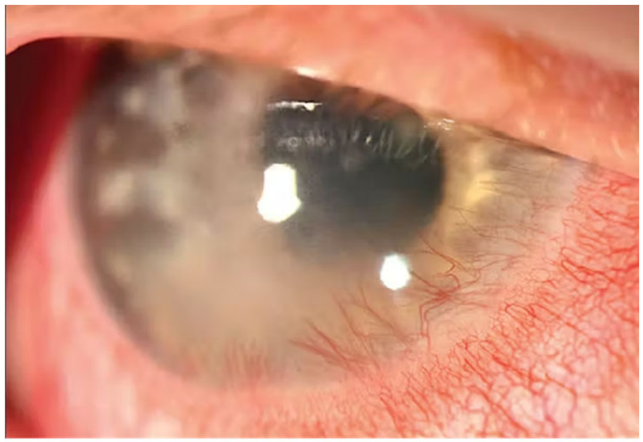
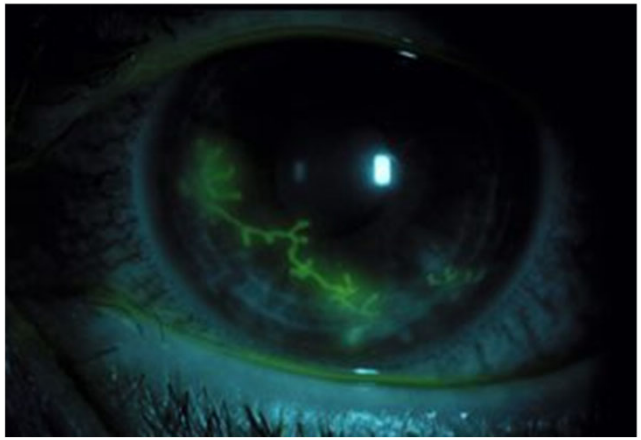
Case #4

Herpes Simplex Keratitis

- Treatment:
  - Acute dose antiviral therapy
    - Can consider topical antiviral for epithelial keratitis, although oral is often better tolerated in children
  - Cover with antibiotic in the setting of any epithelial defect
  - Initiation of steroid if no epithelial involvement or once epithelium is healed
  - Consider antiviral prophylaxis:
    - Bilateral disease
    - Central/paracentral disease/scarring
    - Recurrent disease
    - Immunosuppression





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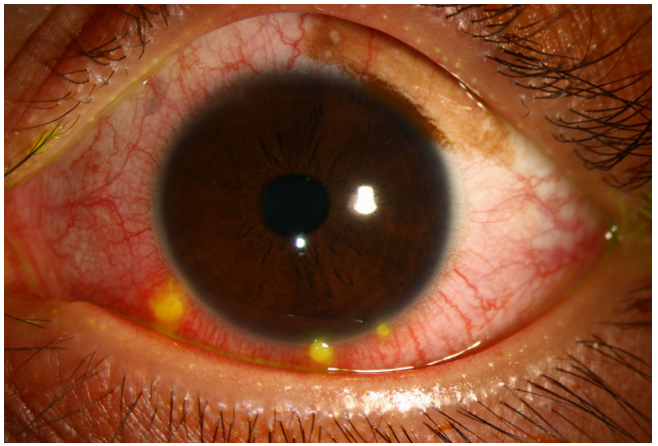
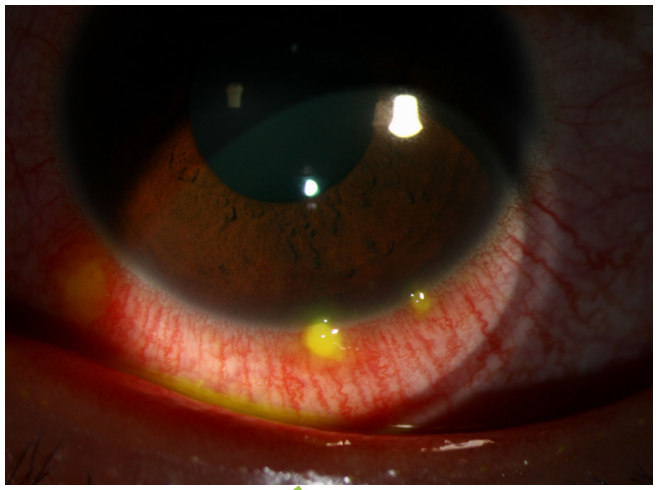
Case #5 **Phlyctenule**

- 7yo F presenting with nodular lesions with adjacent injection at the limbus
- Fluorescein stain shows uptake over each of the lesions. Further exam with MGD, blepharitis, and injection both eyes
- Treatment:
  - Start antibiotic coverage
    - Consider culture swab for both bacteria and HSV
  - Once improving staining (may not fully resolve), initiate topical steroid and plan to taper as stable





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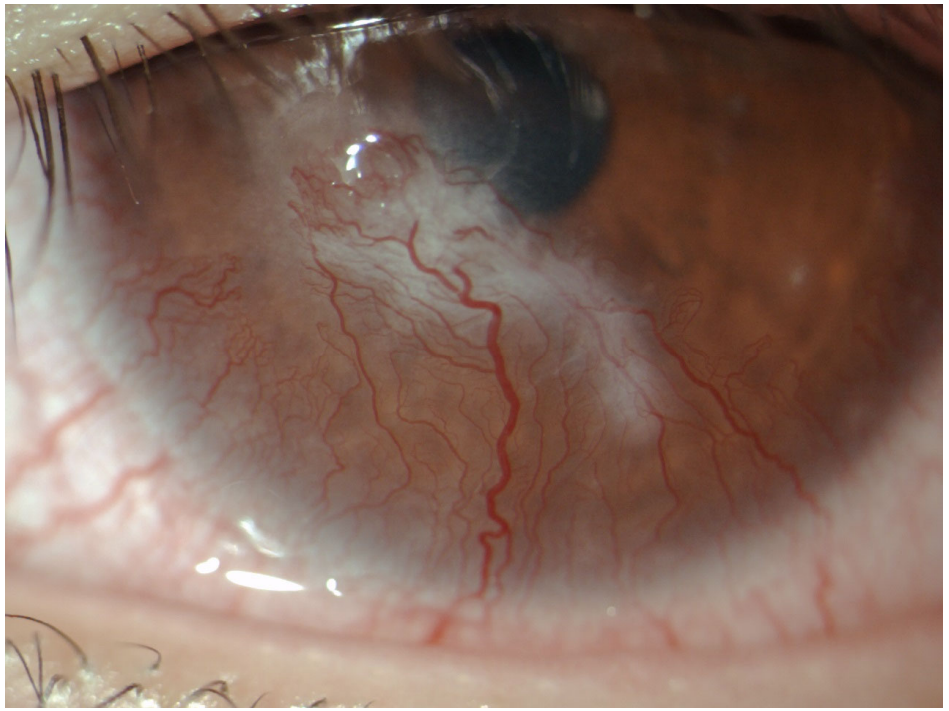
Case #5

Phlyctenular Keratoconjunctivitis

- Patient is improving on topical therapy but then is lost to follow up for 6 months. Upon return, she has not been on any drops for at least 4 months. Mom says her eye was doing much better for a while, but now the right eye has been red again.
- At this point has significant recurrence with corneal involvement
- Treatment:
  - Important to counsel family on chronicity of disease and possible need for LONG steroid taper (many months)
  - Cover with oral antiviral as cannot rule out HSV and now with KNV threatening central axis
  - Consider BCL if non-healing epithelial defect
  - Re-initiate topical steroid once safe
  - Consider steroid-sparing drops (cyclosporine)
  - Also discuss treatment for underlying lid pathology and/or allergies



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Pearls for the Pediatric differential diagnosis of Punctate Epithelial Erosions:

- Meibomian Gland Dysfunction
  - Previous or current Chemotherapy
  - History of BMT; also evaluate for possible ocular GVHD
  - SJS
- Neurotrophic Keratitis
  - History of neurosurgery
  - Certain forms of developmental delays (i.e Riley Day, Dandy Walker)
  - History of trauma, HZV, HSV
- History of trauma with recurrent erosions
- Lids and Lashes
  - SJS/symblepharon/tarsal scarring
  - Trichiasis
  - Epiblepharon
    - May ultimately require surgical intervention if persistent corneal disease

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Pearls for the Pediatric Clinical Exam

- Distraction can be very helpful; small light-up toys, movie on a cell phone
- Trainees: be confident. Kids can literally smell fear…and they will often reflect that behavior back to you
- Use concrete fixation points (ie. Look at the door, your knee, my ear, etc)
- If slit lamp is not feasible, back to basics; utilize your 20D with BIO, or even gross exam with a blue light for staining
- Sometimes a comfort hold is the best option; having staff that is comfortable in assisting is key

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Important Considerations

- If requiring steroids, monitor IOP closely; children can at times have a more rapid and exuberant IOP response than typically seen in adults.
- Remember that many of these diagnoses may have overlapping symptoms and treatment paradigms; consider antiviral coverage if HSV cannot be definitively ruled out
- Take school schedules and nursing support availability when planning treatment regimen
- If requiring frequent drops that may not be able to be managed at home, consider short admission, particularly if any infectious keratitis
- Many of these etiologies are chronic with relapsing episodes and potential to become vision threatening– counsel families up front that this is not a “one and done” type of treatment

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Thank You!

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