Nearly 1 million Americans develop shingles each year.

Ocular involvement accounts for up to 25% of preventing cases.

Over 50% incur long term ocular damage.

**Varicella-Zoster Virus**

- Herpes DNA virus that causes 2 distinct syndromes
  1. Primary infection – Chicken pox (Varicella)
     - Usually in children
     - Highly contagious
     - Very itchy maculopapular rash with vesicles that crust over after ≈ 5 days
     - 96% of people develop by 20 years of age
     - Vaccine now available
Herpes Zoster

- Herpes DNA virus that causes 2 distinct syndromes
  2. Reactivation - Shingles (Herpes Zoster)
     - More often in the elderly and immunosuppressed (AIDS)
     - Systemic work-up if Zoster in someone < 40
     - Can get shingles anywhere on the body
     - Herpes Zoster Ophthalmicus (HZO)
       - Shingles involving the dermatome supplied by the ophthalmic division of the CNV (trigeminal)
       - 15% of zoster cases

Symptoms:
- Generalized malaise, tiredness, fever
- Headache, tenderness, paresthesias (tingling), and pain on one side of the scalp
  - Will often precede rash
- Rash on one side of the forehead
- Red eye
- Eye pain & light sensitivity

Signs:
- Maculopapular rash -> vesicles -> pustules -> crusting on the forehead
- Respects the midline
- Hutchinson sign
  - rash on the tip or side of the nose
- Classically does not involve the lower lid
- Numerous other ocular signs
Other Eye Disease (Acute):
- Acute epithelial keratitis (pseudodendrites)
- Conjunctivitis
- Stromal (interstitial) interstitial keratitis
- Endotheliitis (disciform keratitis)
- Neurotrophic keratitis

Other Eye Disease (Acute):
- Episcleritis
- Scleritis
- Anterior uveitis
- IOP elevation
- Retinitis
- Choroiditis
- Neurological complications (nerve palsies)
- Vascular occlusion

Treat the complications just like as if they were primary conditions

Treatment:
- Treat the complications just like as if they were primary conditions
- Oral antivirals – must be started within 72 hours of symptoms**
  - Acyclovir 800mg 5x/day x 7-10 days
  - Valtrex 1000mg 3x/day X 7-10 days
  - Famciclovir 500mg 3x/day X 7-10 days
- Topical ointment to skin lesions to help prevent scarring
  - Bacitracin, erythromycin
Herpes Zoster

- Prevention:
  - Zostavax vaccine
    - Live attenuated herpes virus
    - Only given to people who know they had chickenpox as a child***
    - Only studied in patients > 60 yo
      - 51% reduction in incidence of HZ
      - 60% reduction in symptom severity in those who got HZ
      - 66.5% reduction in post-herpetic neuralgia

- Post-herpetic Neuralgia
  - Constant or intermittent pain that persists for more than one month after the rash has healed
  - Older patients with early severe pain and larger area are at greater risk
  - Can be so severe that it leads to depression & suicide
  - Improves with time
  - Only 2% of pts affected 5 years out
  - Tx:
    - Cool compresses
    - Topical capsaicin ointment or lidocaine cream
    - Analgesics (Tylenol 3, Vicoden)
    - Amitriptyline 25mg PO TID
    - Neurontin (Gabapentin)

Viral conjunctivitis

- Symptoms:
  - Red eye
  - Irritation/foreign body sensation
  - Burning
  - Itching
  - Watery discharge*
  - History of recent cold/flu
    - Or being around someone with a cold or flu
  - Starts in one eye then goes to the other
Viral conjunctivitis

- **Signs:**
  - Red eye (conj hyperemia)
  - Watery discharge
  - Follicles in the inferior fornix & conj
  - (+) PA node
  - Red/swollen eyelids
  - Petechial sub-conj hemes
  - SPK
  - SEI's (sub-epithelial infiltrates)
  - Pseudomembranes/membranes often seen in EKC

EKC

- **Timecourse**

EKC conjunctivitis

- **Diagnosis**
  - Based on clinical symptoms

- **Treatment:**
  - Cool compresses
  - Artificial tears
  - “get the red out drops”
    - Vasoconstrictors such as Visine
  - Hygiene
  - Quarantine/Isolation
  - Betadine 5% solution
  - Zirgan
  - Lotemax/Pred Forte QID - not until late
Most common virus found in humans
- 60-99% are infected by 20 years old

Double stranded DNA virus
- HSV type 1 (HSV-1)
- HSV type 2 (HSV-2)

Primary infection
- Occurs in childhood via droplet exposure
- Subclinical infection in most

Secondary infection (recurrence)

Recurrent infection:
- After primary infection the virus is carried to the sensory ganglion for that dermatome (trigeminal ganglion) where a latent infection is established.
- Latent virus is incorporated in host DNA and cannot be eradicated
- Stressors (trauma, UV light, fever, hormonal changes, finals week, etc) cause reactivation of the virus and it is transported in the sensory axons to the periphery -> clinical signs/symptoms

Ocular recurrence -> 10% at one year, 50% at ten years

Epithelial Keratitis:
- Symptoms:
  - Ocular irritation, redness, photophobia, watering, blurred vision
- Signs:
  - Swollen opaque epithelial cells arranged in a course punctate or stellate pattern
  - Central desquamation results in a dendrite***
    1. Central ulceration
    2. Terminal end bulbs
  - ***Corneal sensation is reduced***
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Epithelial Keratitis:
- Signs (con't):
  - Mild associated subepithelial haze
  - Elevated IOP***
  - Persistant SPK and irregular epithelium as the ulcer is healing
- Differential diagnosis:
  - Herpes zoster
  - Healing corneal abrasion
  - Acanthamoeba keratitis
  - Medicamentosa

Epithelial Keratitis:
- Treatment:
  - Zirgan (ganciclovir gel 0.15%)
    - 5x/day until the dendrite disappears
    - 3x/day for another week
  - Viroptic (trifluridine solution 1%)
    - 9x/day until the dendrite disappears
    - 5x/day for another week
  - Oral antivirals (if topical not well tolerated):
    - Acyclovir 400 mg 5x/day X 7-10 days
    - Valtrex 500 mg 3x/day X 7-10 days
    - Famvir 250 mg 3x/day X 7-10 days
Epithelial Keratitis:  
- Treatment (cont):  
  - Debridement of the dendritic ulcer???
  - Oral antivirals???
  - IOP control
  - Avoid prostaglandins???
  - Steroids???
- Follow-up  
  - Day 1, 4, 7

Marginal keratitis:  
- Very rare
- Looks like a marginal infiltrate...but

In HSV marginal keratitis:  
1. Much more pain
2. Deep neovascularization
3. No clear zone between infiltrate and limbus

Immune Stromal Keratitis (ISK):  
- 2% of initial ocular HSV presentations
- 20-61% of recurrent disease
- 88% non-necrotizing
- 7% necrotizing
- ***Can be visually devastating***
**Immune Stromal Keratitis:**
- **Symptoms:**
  - Gradual blurred vision
  - Halos
  - Discomfort/Pain
  - Redness
- **Signs (non-necrotizing):**
  - Stromal haze (inflammation & edema)
  - Neovascularization (deep)
  - Immune ring
  - Scarring and/or thinning
  - Intact epithelium***
- **Signs (necrotizing):**
  - All of the above
  - More dense infiltration
  - Often w/ overlying epithelial defect
  - Necrosis and/or ulceration
  - *****high perforation risk***

**Treatment:**
- Topical steroids
  - Pred Forte QID
  - Durezol QID
  - Lotemax QID
- Topical anti-viral cover
  - Viroptic ( trifluoridine 1%) QID
  - Zirgan (ganciclovir 0.15%) QID
- Topical cyclosporin (Restasis), AT’s, ung’s to facilitate epithelial healing if ulceration is present
Endotheliitis: AKA Disciform Keratitis

- Not considered a primary form of stromal keratitis
- Stromal edema is present secondary to endothelial inflammation

- Symptoms:
  - Blurred vision
  - Halos
  - Discomfort/Pain
  - Redness

Signs:

- Central zone of stromal edema often with overlying epithelial edema
- KP’s underlying the edema
- AC reaction
- IOP may be elevated
- Reduced corneal sensation
- Healed lesions often have a faint ring of stromal or subepithelial opacification and thinning

Treatment:

- Topical steroids
  - Pred Forte QID
  - Durezol QID
  - Lotemax QID
- Topical anti-viral cover
  - Viropic ( trifluridine 1%) QID
  - Ziran ( ganciclovir 0.15%) TID
- Topical cyclosporin (Restasis), AT’s, ung’s to facilitate epithelial healing if ulceration is present
Neurotrophic Keratitis:
- Keratopathy occurs from loss of trigeminal innervation to the cornea resulting in complete or partial anaesthesia
- The cornea is numb so the pt doesn’t blink
- Sx’s:
  - Irritation/burning/FB sensation
  - Redness
  - Tearing
  - Decreased vision

Signs:
- Decreased corneal sensation***
- Interpalpebral SPK
- Persistent epithelial defects in which the epithelium at the edge of the lesion appears rolled and thickened, and is poorly attached
- Advanced cases may have sterile ulceration, keratitis, and/or corneal melt
- Pt may be surprisingly asymptomatic**

Tx:
- Find out the cause
- D/C any meds that may be responsible
- Lubricate, lubricate, lubricate***
  - Preservative free AT’s, gels, and ung’s q1h-QID
- Topical Ab drops and/or ung (Polytrim QID, etc)
- Taping the eyelids at night to ensure adequate closure
- In severe cases:
  - Patching, tarsorrhaphy, Botox to induce ptosis
**Neurotrophic Keratopathy**

- **Tx:**
  - Healing an ulcer that won’t heal
    1. Autologous serum
    2. Prokera
      - Amniotic membrane in a CL skirt
    1. Also could use a scleral lens

**Herpes Simplex Epithelial Keratitis**

- **My Regimen:**
  - Zirgan 5x/day until the ulcer heals, then 3x/day for one week
  - Oral Valtrex 500 mg 3x/day for 7-10 days
  - Artificial tears
  - L-Lysine 2 grams daily
  - Debride the ulcer?

- RTC 1 day, 4 days, 7 days

**Herpes Simplex Keratitis**

- **Prophylactic Treatment:**
  - Reduces the rate of recurrence of epithelial and stromal keratitis by ≈ 50%
    - Acyclovir 400 mg BID
    - Valtrex 500 mg QD
    - Famvir 250 mg QD
  - L-Lysine 1 gram/day
  - Frequent debilitating recurrences, bilateral involvement, or HSV infection in an only eye
**Herpes Simplex**

- Visual Prognosis:
  - 90% 20/40 or better after 12 years
  - 3% 20/100 or worse after 12 years

**QUESTIONS?**

**THANK YOU!**