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
- 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

Herpes Zoster
- 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

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

Prevention:
- Zostavax vaccine
  - Live attenuated herpes virus
  - Only given to people who know they had chicken pox as a child***
  - Only studied in patients > 60 yo
  - 91% 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)

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

**Herpes Simplex**
- **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

**Herpes Simplex Keratitis**
- **Epithelial Keratitis:**
  - Symptoms:
    - Ocular irritation, redness, photophobia, watering, blurred vision
  - Signs:
    - Swollen opaque epithelial cells arranged in a course punctate orstellate pattern
    - Central desquamation results in a dendrite***
      1. Central ulceration
      2. Terminal end bulbs
      - ***Corneal sensation is reduced***
Herpes Simplex Keratitis

- **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***

- **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

- **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
    - Valtrix 500 mg 3x/day X 7-10 days
    - Famvir 250 mg 3x/day X 7-10 days

- **Treatment (con’t):**
  - Debridement of the dendritic ulcer??
  - Oral antivirals??
  - IOP control
    - Avoid prostaglandins??
    - Steroids??

- **Follow-up**
  - Day 1, 4, 7

Herpes Simplex Keratitis

- **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

Herpes Simplex Keratitis

- **Immune Stromal Keratitis (ISK):**
  - 2\% of initial ocular HSV presentations
  - 20-61\% of recurrent disease
  - 88\% non-necrotizing
  - 7% necrotizing
  - ***Can be visually devastating***
**Herpes Simplex Keratitis**

- **Immune Stromal Keratitis:**
  - **Symptoms:**
    - Gradual blurred vision
    - Halos
    - Discomfort/Pain
    - Redness

- **Endotheliitis:** AKA Disciform Keratitis
  - **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

**Herpes Simplex Keratitis**

- **Immune Stromal Keratitis:**
  - **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***

**Herpes Simplex Keratitis**

- **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

**Herpes Simplex Keratitis**

- **Endotheliitis:** AKA Disciform Keratitis
  - **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

**Herpes Simplex Keratitis**

- **Treatment:**
  - Topical steroids
    - Pred Forte QID
    - Durezol QID
    - Lotemax QID
  - Topical anti-viral cover
    - Viropic (trifluridine 1%) QID
    - Zirgan (ganciclovir 0.15%) QID
  - 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

Prophylactic Treatment:
- Reduces the rate of recurrence of epithelial and stromal keratitis by ≈ 50%
**Herpes Simplex**

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

**QUESTIONS?**

**THANK YOU!**