Thanks to all who contributed to this presentation

Special thanks to
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RED EYE
(NON-VISION-THREATENING DISORDERS)

- Subconjunctival hemorrhage
- Conjunctivitis
- Blepharitis
- Keratitis
- Dry eye
- Pterygium/pingueculum
RED EYE
(VISION-THREATENING DISORDERS)

- Iritis/uveitis
- Corneal ulcers
- Angle-closure glaucoma
- Preseptal/orbital cellulitis
- Endophthalmitis
- Trauma
External examination

Subconjunctival hemorrhage

Conjunctival injection
External examination

Conjunctival injection
RED EYE
(NON-VISION-THREATENING DISORDERS)

- Subconjunctival hemorrhage
RED EYE
(NON-VISION-THREATENING DISORDERS)

Subconjunctival hemorrhage with chemosis

Keep conjunctiva moist with antibiotic ointment
Posterior petechial hemorrhages

Think embolic disease
Subconjunctival air!
RED EYE (NON-VISION-THREATENING DISORDERS)

- Conjunctivitis: NOT
RED EYE
(NON-VISION-THREATENING DISORDERS)

- Conjunctivitis
  - Allergic

Allergic to Polytrim
RED EYE
(NON-VISION-THREATENING DISORDERS)

- Conjunctivitis
  - bacterial
RED EYE
(NON-VISION THREATENING DISORDERS)

- Conjunctivitis
  - chemical

Proparacaine abuse
EYELID ANATOMY

Tarsal plate

MEIBOMIAN GLAND

Orbicularis oculi muscle

Hair follicle

Perifollicular glands

Eyelash

Skin

UPPER EYELID:
ANTERIOR ANATOMY
Meibomianitis
RED EYE (NON-VISION-THREATENING DISORDERS)

- Blepharitis

Acute
BLEPHARITIS

Subacute

Chronic
External hordeolum
Internal hordeolum
Chalazion
Blepharo-conjunctivitis
RED EYE
(NON-VISION-THREATENING DISORDERS)

- Keratitis: dendritic
RED EYE
(NON-VISION-THREATENING DISORDERS)

- Keratitis
  - viral

HSV-1

H. zoster
The cornea

Ultraviolet keratitis
RED EYE
(NON-VISION-THREATENING DISORDERS)

- Pterygium/pingueculum

Active

Dormant
Squamous cell carcinoma in pterygium
Pingueculum (inflamed)
RED EYE
(VISION-THREATENING DISORDERS)

- Iritis/uveitis
- Corneal ulcers
- Angle-closure glaucoma
- Preseptal/orbital cellulitis
- Endophthalmitis
- Trauma
AC REACTION

“Flare and cell”
RED EYE
(VISION-THREATENING DISORDERS)

- Corneal ulcers

High risk group:
CW contact lens wearers
KERATITIS

Corneal infiltrate
Marginal ulcer with infiltrate
External examination

Hypopyon
Narrow angle glaucoma

- Onset 50+ y.o.
- Severe eye pain
- Blurred vision
- Red eye
- Headache/nausea
- Corneal edema

- Mid-dilated, fixed pupil
- “Glaukomflecken”
- Iris atrophy
- Severe anterior chamber inflammation
Angle closure attack!

- Severe pain
- Blurred vision
- Mid-dilated, fixed pupil
- Hazy cornea
RED EYE
(VISION-THREATENING DISORDERS)

- Preseptal/orbital cellulitis
Orbital Cellulitis

- Severe pain
- Proptosis
- Limited EOMs
- Conjunctival congestion
- Diabetic?
Frontal, ethmoid, maxillary and orbital abscesses
RED EYE (VISION-THREATENING DISORDERS)

- Endophthalmitis
  - Severe pain
  - Photophobia
  - Poor vision
  - Recent intra-ocular surgery
OCULAR TRAUMA

- Disruption of globe
- Intraocular foreign bodies
- Hyphemas
- Orbital wall fractures
- Foreign bodies
- Corneal abrasions
- Complications of blunt trauma
Epithelium
Bowman's layer
Stroma
Descemet's membrane
Endothelium
CORNEA
OCULAR TRAUMA
(Complications of blunt trauma)

- Disruption of globe
Perforated or not?

Mesquite thorn puncture
Seidel test: Use concentrated fluorescein
POSITIVE SEIDEL

Pinpoint perforation

Leaking bleb
OCULAR TRAUMA

- Perforating trauma

The pupil is your clue
OCULAR TRAUMA

- Perforating trauma

Dart puncture with eyelash
Corneal puncture wound with abscess
After 3 days of Garamycin Rx
Conjunctival flap
Three months after flap
DISASTER!
**SYMPATHETIC OPHTHALMIA**

*(BILATERAL granulomatous panuveitis after trauma)*

- **Onset:** 5 days to 66 years after penetrating trauma
- **Onset:** 33% at 3 mo., <50% after 1 year
- **Removal of injured eye after onset does not help**
- **Cause:** antigen-antibody interaction
- **Risk:** 0.015-1.9% (lowest after planned surgery)
- **Treatment:** immunosuppressive therapy
OCULAR TRAUMA

- Intraocular foreign bodies
- Hyphemas
- Orbital wall fractures
- Foreign bodies
- Corneal abrasions
- Chemical burns
- Corneal lacerations
Evaluation of intraocular foreign bodies

- Determine visual acuity
- Examine for global integrity and degree of damage
- Do fundus examination
- Place shield over eye
- Call ophthalmologist
OCULAR TRAUMA

- Intraocular foreign bodies
Poor visibility

Situation worsening!
Metal fragment
Complications of Blunt Trauma

- Ruptures of the globe
- Hyphema
- Blow-out fractures
- Retinal tears/detachments
- Glaucoma
- Cataract
- Dislocation of the lens
OCULAR TRAUMA

- **Hyphemas**

Rubeosis

Hyphema
Layered hyphemas
# Visual prognosis among traumatic hyphemas

<table>
<thead>
<tr>
<th>Degree of hyphema</th>
<th>No. of Patients</th>
<th>Percent with final acuity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&gt;20/50</td>
</tr>
<tr>
<td>Partial hyphema</td>
<td>191</td>
<td>77</td>
</tr>
<tr>
<td>Total hyphema</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>All hyphemas</td>
<td>227</td>
<td>70</td>
</tr>
</tbody>
</table>

8 month followup  Am J Ophthal 5: 1, 1973
OCULAR TRAUMA

- Orbital wall fractures

With muscle entrapment
Classic blowout fracture of orbital floor and ethmoids
OCULAR TRAUMA

Orbital floor fracture

Muscle entrapment
OCULAR TRAUMA

Entrapment of inferior rectus muscle following blowout fracture
OCULAR TRAUMA

- Foreign bodies
RED EYE
(Rule out trauma)

- Foreign bodies

- Organic
- Metallic
Corneal foreign bodies
Instruments
No, No
Now what?
Burr the rust!
Limit depth near the pupil
### Cumulative incidence of corneal healing

<table>
<thead>
<tr>
<th>Probability of corneal healing</th>
<th>Patched N=82</th>
<th>Non-patched N=81</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 1 day</td>
<td>0.51</td>
<td>0.60</td>
</tr>
<tr>
<td>After 2 days</td>
<td>0.78</td>
<td>0.83</td>
</tr>
<tr>
<td>After 3 days</td>
<td>0.92</td>
<td>0.98</td>
</tr>
</tbody>
</table>

Never patch more than 12 hours

Use antibiotic ointment
Semipressure patch
OCULAR TRAUMA

- Corneal abrasions
Fingernail damage
Cigarette burn

Curling iron
Airbag abrasions
OCULAR TRAUMA

- Chemical burns
Treatment of chemical burns

- Start high volume BSS irrigation
- Sweep fornices for retained material
- Determine type of chemical (alkali worse than acid)
- Check pH (goal is 7.0)
- Call ophthalmologist
BLUNT TRAUMA

Retinal tears
Limited views

Before and After the Pupil Is Dilated

Undilated pupil

Dilated pupil

Portion of retina that can be seen through undilated pupil.

Portion of retina that can be seen through dilated pupil.

Courtesy of the National Eye Institute
## Delayed Diagnosis of Traumatic Retinal Detachments

<table>
<thead>
<tr>
<th>Interval between trauma and diagnosis</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>12</td>
</tr>
<tr>
<td>1 month</td>
<td>30</td>
</tr>
<tr>
<td>8 months</td>
<td>50</td>
</tr>
<tr>
<td>24 months</td>
<td>80</td>
</tr>
</tbody>
</table>
BLUNT TRAUMA

Retinal edema (commotio retinae)
Traumatic cataracts
Ectopia lentis
THANK YOU