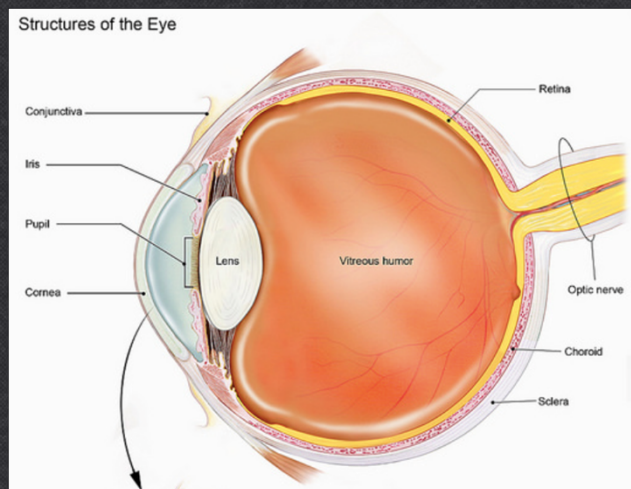


# Common Eye Injuries

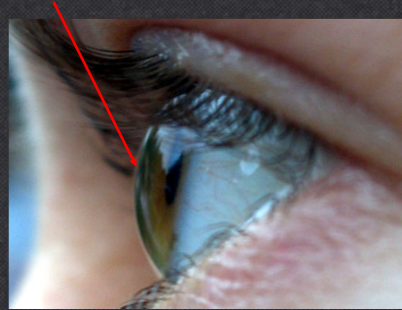
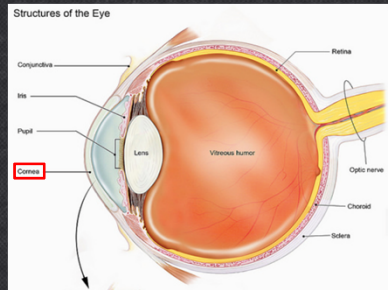
**Mona Adeli, MD**  
Assistant Clinical Professor of Ophthalmology  
Havener Eye Institute  
Department of Ophthalmology and Visual Science  
The Ohio State University

## Brief Overview of Eye Anatomy



Source: National Eye Institute

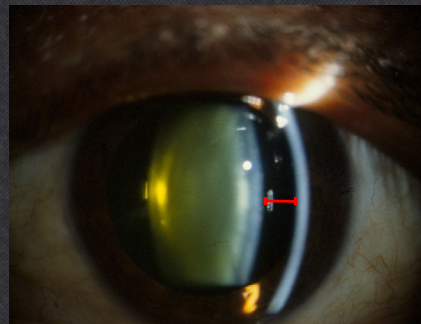
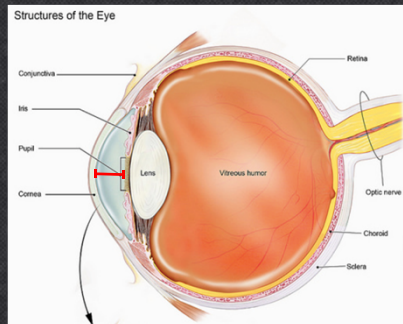
# Cornea



Source: National Eye Institute

Author: Paul Savage - (CC BY 2.0)

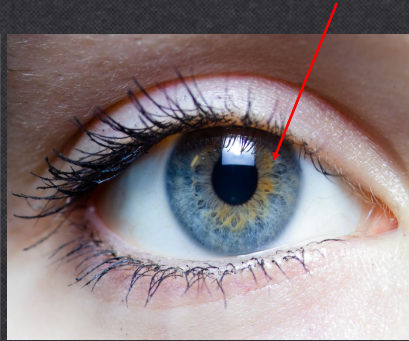
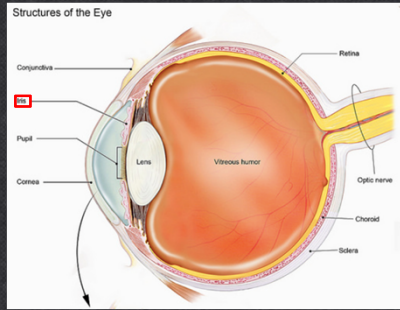
# Anterior Chamber



Source: National Eye Institute



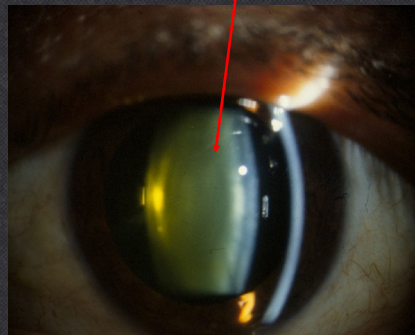
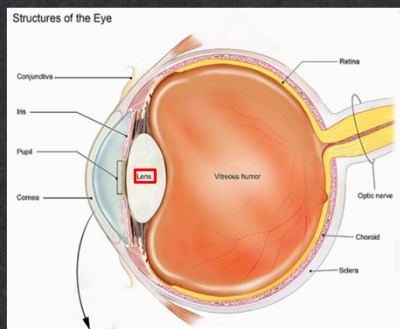
# Iris



Source: National Eye Institute

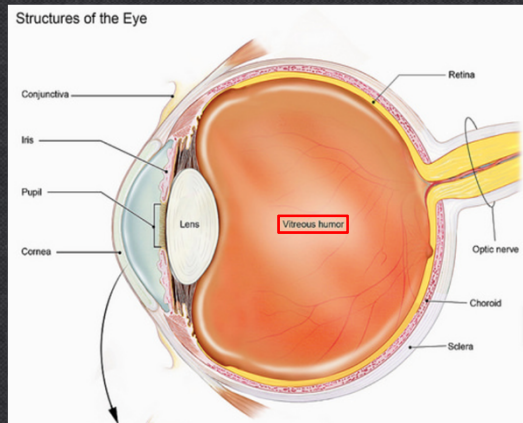
Author: Laitr Keiows - (CC BY-SA 3.0)

# Lens



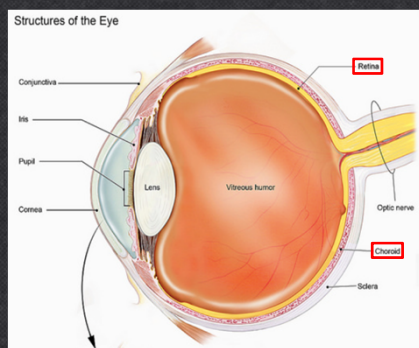
Source: National Eye Institute

# Vitreous Cavity



Source: National Eye Institute

# Retina / Choroid

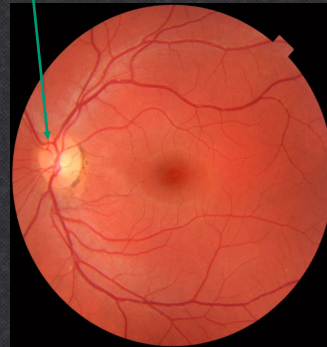
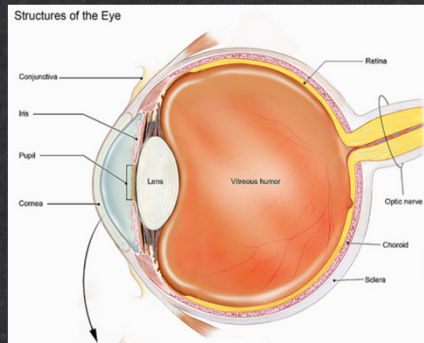


Source: National Eye Institute

Author: Optomap - (CC BY-SA 4.0)



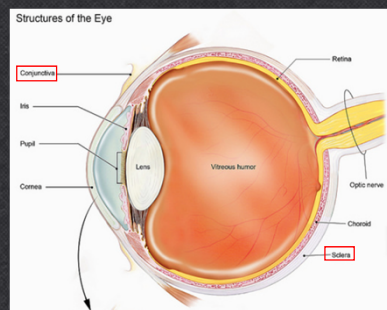
# Optic Nerve



Source: National Eye Institute

Author: By Mikael Häggström, used with permission.

# Sclera / Conjunctiva



Source: National Eye Institute

Author: Laitr Keiows - (CC BY-SA 3.0)

# Common Eye Injuries

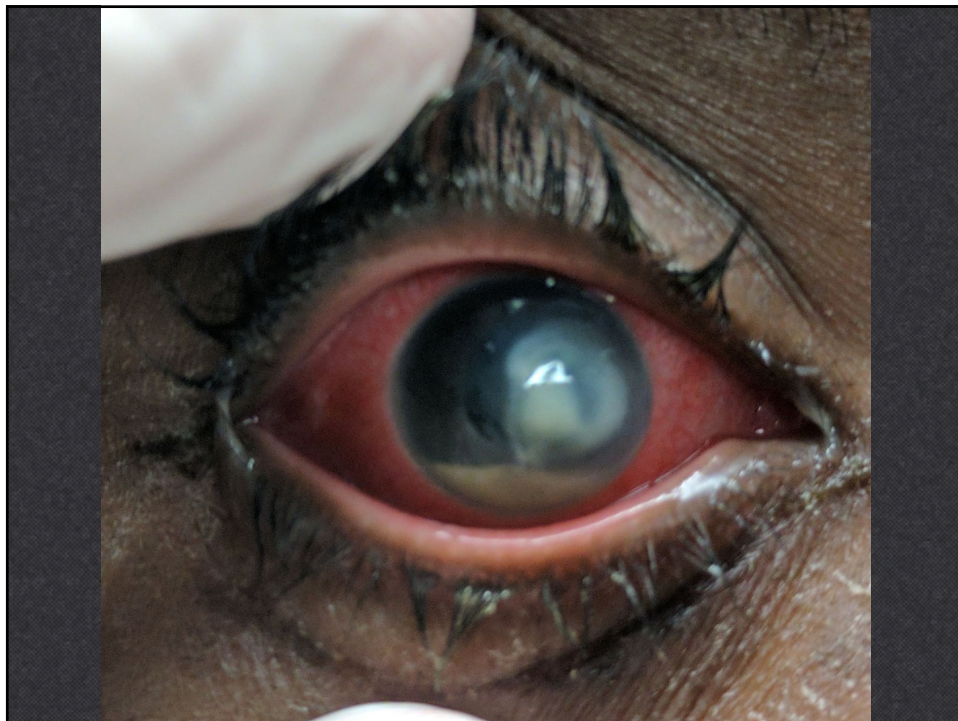
**Tyler Oostra, MD**  
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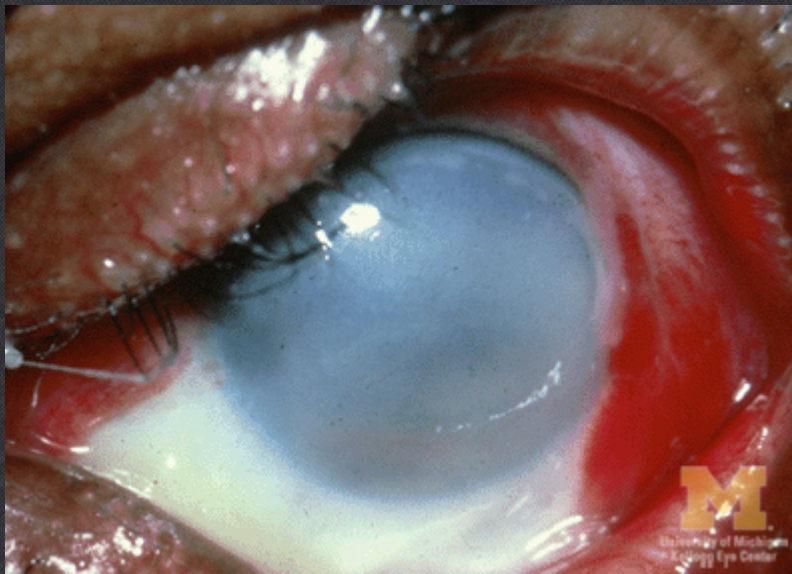
# Corneal Abrasion

- **Symptoms:** sharp pain, photophobia, foreign body sensation, history of trauma
- **Signs:** epithelial defect that stains with fluorescein
- **Treatment**
  - Antibiotic drops or ointment (e.g. erythromycin, bacitracin, polymyxin B/trimethoprim)
    - If contact lens wearer, consider fluoroquinolone drops
  - No patching or anesthetic drops, no contact lens wear
- **Follow-up:** 1-5 days to ensure improvement or resolution



# Corneal Ulcer

- **Symptoms:** redness, pain, photophobia, decreased vision, discharge
- **Signs:** white corneal infiltrate with overlying epithelial defect
- **Treatment**
  - **Bacterial:** fluoroquinolone drops (e.g. ciprofloxacin or moxifloxacin) for low risk ulcers, fortified antibiotics for higher risk ulcers
  - Cycloplegic drops
  - No patching or anesthetic drops, no contact lens wear
- **Refer immediately**



Source: The University of Michigan - (CC BY 3.0 US)



# Chemical Burn

- Symptoms: redness, pain, photophobia, decreased vision, history of chemical injury
- Signs: epithelial defect or corneal opacification, injection or blanching of conjunctival vessels, chemosis
- Treatment
  - Immediate copious irrigation with saline or Ringer lactate solution until neutral pH is achieved
  - Sweep conjunctival fornices, evert eyelids
  - Antibiotic ointment and cycloplegic drops
- Refer if vision is decreased



## Corneal and Conjunctival Foreign Bodies

- Symptoms: foreign body sensation, tearing
- Signs: presence of foreign body, rust ring
- Treatment
  - Remove superficial foreign bodies with irrigation, cotton-tipped applicator, fine forceps, or foreign body spud
  - Treat similarly to corneal abrasion with antibiotic drops or ointment
- Refer if foreign body is not superficial or unable to remove easily

## Common Eye Injuries

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## Conjunctival Laceration

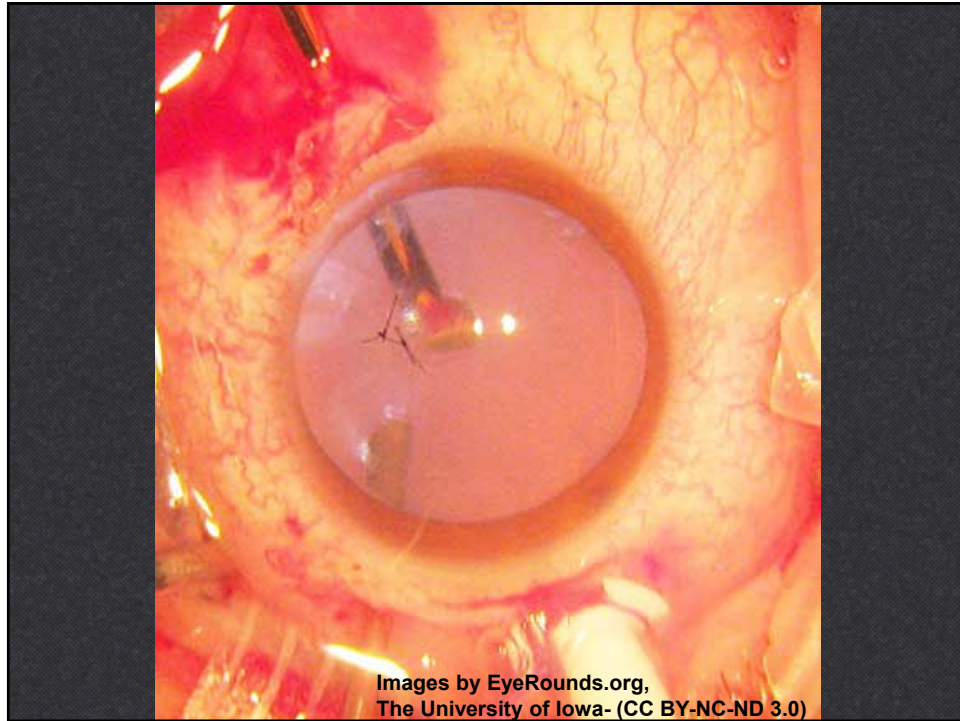
- Symptoms: hx of trauma, mild pain, foreign body sensation, redness
- Signs: conjunctival defect with fluorescein uptake, exposed white sclera, subconjunctival hemorrhage
- Treatment
  - Antibiotic ointment
  - Large lacerations > 1.0 cm may require suturing
- Refer immediately – rule out penetrating or perforating eye injury, intraocular foreign body



## Corneal / Scleral Lacerations or Rupture aka “Open Globe”

- Symptoms: hx of trauma, pain, decreased vision, loss of fluid from the eye
- Signs: full thickness laceration, hemorrhagic chemosis, shallow or deep anterior chamber, peaked or irregular pupil
- Treatment
  - **Surgical repair in the operating room**
  - **In the meantime: hard eye shield, NPO, pain and nausea control, IV access, systemic antibiotics, bedrest, tetanus prophylaxis**
- Refer immediately



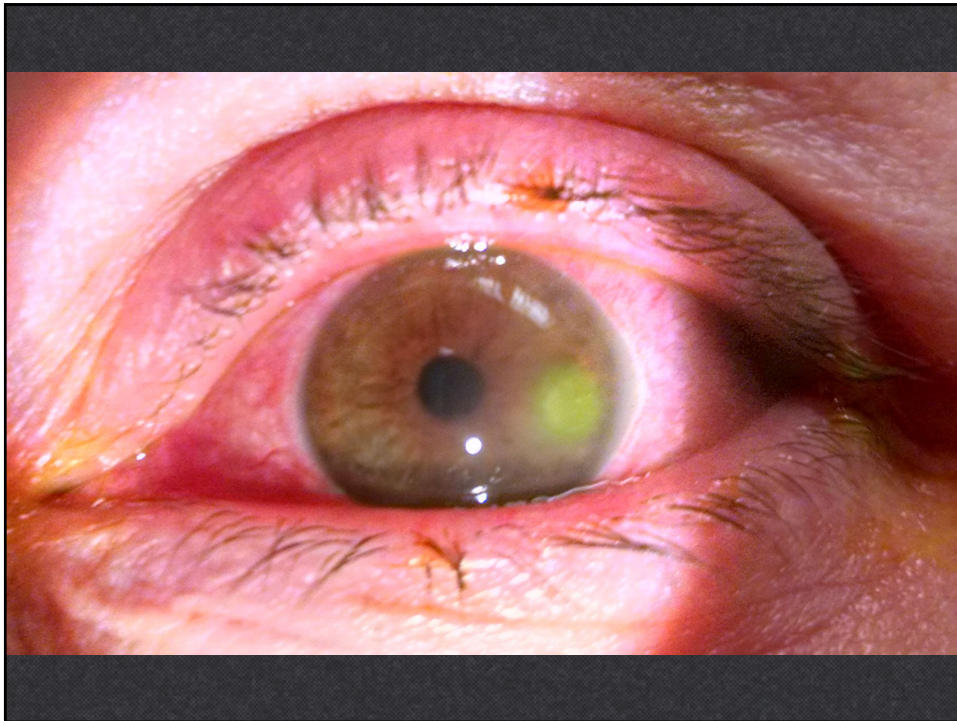


## Intraocular Foreign Body

- Symptoms: may be similar to that of open globe, hx of sharp object entering eye or hammering metal
- Signs: may be similar to that of open globe, or entry site may not be readily apparent
- Treatment
  - Acute IOFB: surgical removal
  - Chronic IOFB: surgical removal if associated with inflammation
- Refer immediately if acute

# Common Eye Injuries

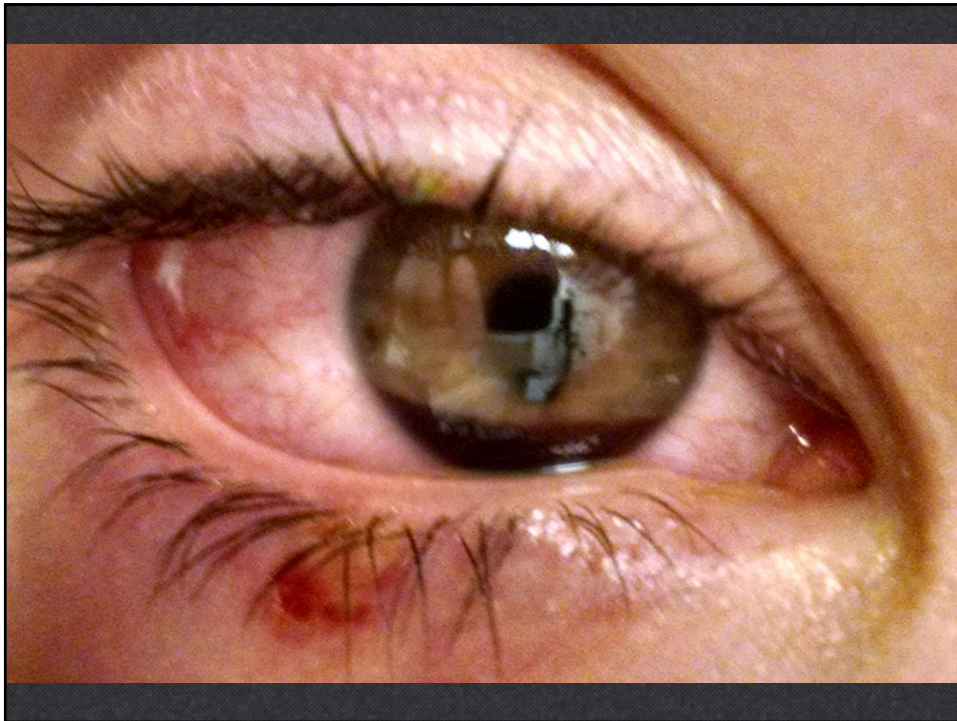
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# Traumatic Iritis

- Symptoms: dull throbbing pain, photophobia, recent trauma
- Signs: white blood cells and flare in the anterior chamber, perilimbal injection
- Treatment
  - Cycloplegic drops
  - Cautious use of steroid drops
- Refer if no improvement in 2-3 days or associated with other injuries



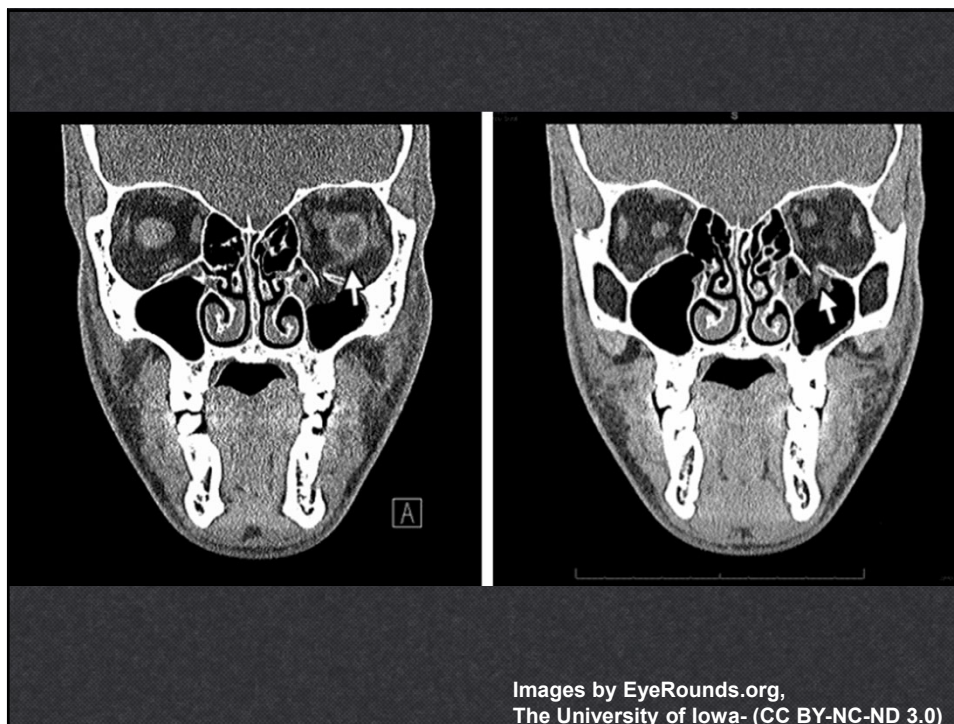
# Hyphema

- Symptoms: pain, decreased vision, history of blunt trauma
- Signs: blood in the anterior chamber
- Treatment
  - Bed rest, elevate head of bed, eye shield
  - No blood thinners
  - Cycloplegic drops
  - Steroid drops
  - IOP lowering drops as needed
- Refer immediately

# Common Eye Injuries

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## Orbital Fractures / Entrapment

- Symptoms: hx of trauma, periorbital swelling, double vision, pain with eye movement
- Signs: restricted extraocular motility, hypesthesia in distribution of infraorbital nerve, periorbital edema, enophthalmos, hypoglobus
- Treatment:
  - **CT orbits / face**
  - **Considerations: oral antibiotics, corticosteroids, nasal decongestants, sinus precautions**
  - **Immediate repair if muscle entrapment**
  - **Delayed repair if persistent diplopia or large fracture**
- Refer immediately – rule out ocular injury, entrapment

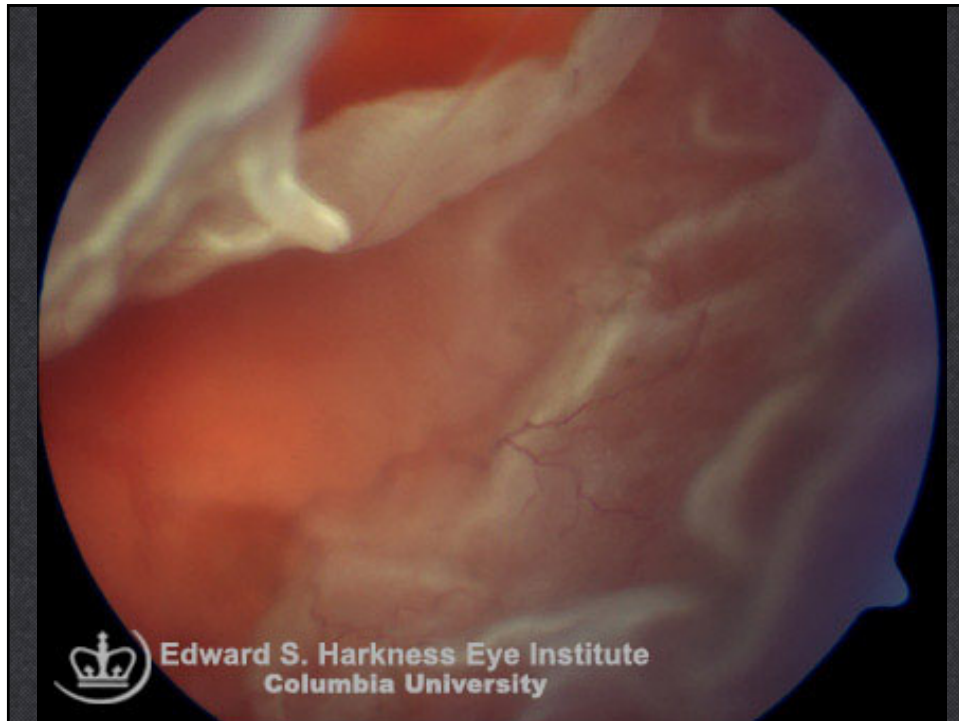
Images by EyeRounds.org,  
The University of Iowa- (CC BY-NC-ND 3.0)



## Retrobulbar Hemorrhage

- Symptoms: hx of trauma, pain, decreased vision, inability to open eyelids
- Signs: proptosis, resistance to retropulsion, tense eyelids that are difficult to open, increased intraocular pressure, possible vision loss or afferent pupillary defect
- Treatment: **urgent lateral canthotomy and cantholysis**
- Refer immediately – consider ED vs local ophthalmologist





## Retinal Tears and Detachments

- Symptoms: flashes, floaters, may have decreased vision or a curtain/shadow in vision
- Signs: pigment in anterior vitreous, retinal tear/flap, elevation of retina by subretinal fluid
- Treatment
  - Laser retinopexy in acute symptomatic or traumatic break
  - Surgical repair – urgent if threatens the fovea, less urgently if macula is off
- Refer immediately