


# Vision Emergencies for Primary Care Providers

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Ophthalmology - Glaucoma  
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Primary Care Symposium  
March 14, 2017



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## Disclosures

- ▶ No relevant financial disclosures

Award acknowledgement: Heed Fellow



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## Learning Objectives

- ▶ Use at least one new approach for the evaluation and differential diagnosis of high acuity eye conditions
- ▶ Manage treatment of ocular emergencies using best current evidence



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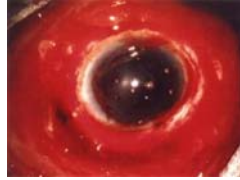
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### ARS Question #1

- ▶ Name the diagnosis
  - a. Subconjunctival hemorrhage
  - b. Acute glaucoma
  - c. Endophthalmitis
  - d. Ruptured globe



\* Correct Answer (d)

Image Acknowledgement: Emedicine Medscape  
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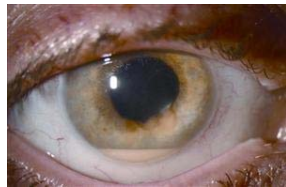
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### ARS Question #2

- ▶ Name the diagnosis
  - a. Hyphema
  - b. Endophthalmitis
  - c. Acute glaucoma
  - d. Corneal ulcer



\* Correct Answer (b)

Obtained with permission from American Academy of Ophthalmology



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### ARS Question #3

- ▶ Name the diagnosis
  - a. Corneal melt
  - b. Endophthalmitis
  - c. Acute glaucoma
  - d. Corneal ulcer



\* Correct Answer (a)

Image Acknowledgement: U of Iowa  
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### ARS Question #4

▶ Name the diagnosis

- a. Endophthalmitis
- b. Ruptured Globe
- c. Acute glaucoma
- d. Retrobulbar hemorrhage



\* Correct Answer (d)

Image Acknowledgement:  
Tripura Medical College, India  
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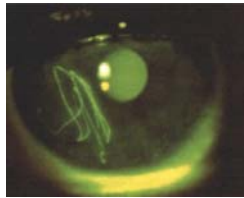
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### ARS Question #5

▶ Name the diagnosis

- a. Bacterial keratitis
- b. Foreign body corneal abrasion
- c. Herpes keratitis
- d. Acute glaucoma



\* Correct Answer (b)

Image Acknowledgement:  
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### What do you mean by “acuity”?

- ▶ Need immediate intervention
- ▶ High severity
- ▶ Clarity of central vision (visual acuity)



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## Outline

- 1) Traumatic Emergencies
- 2) Non-Traumatic Emergencies
  - 1) Neuro-ophthalmic
  - 2) Ocular



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## Ruptured Globe

- ▶ Blunt vs penetrating
- ▶ "360 rule"





Image Acknowledgment:  
Medscape, DailyEM  
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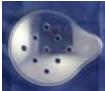

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## What you should think about for Ruptured Globe

- ▶ Rule out intraocular foreign body (IOFB)
- ▶ Evaluate for orbital fracture
  - *CT orbit 1mm sections with coronal reconstruction*
- ▶ Pain control
- ▶ Nausea control
- ▶ Tetanus status
- ▶ Intravenous antibiotic (moxifloxacin is best)
- ▶ Protective shield over the eye (do not patch)
- ▶ Do not ultrasound the eye



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### Orbital Fracture

- ▶ Ethmoid bone is thinnest, but a floor fracture is most common
- ▶ Rule out EOM entrapment
- ▶ Be careful that a white eye in kids does not exclude entrapment!

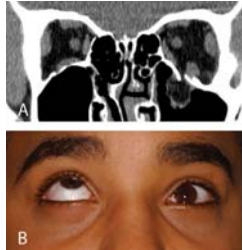


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### Orbital Compartment Syndrome (from orbital fracture)

Causes of acute high intraorbital pressure

- ▶ Retrobulbar hematoma
- ▶ Orbital emphysema

Clinical Diagnosis

- ▶ Reduced EOM
- ▶ Tight orbit (not soft lid edema)
- ▶ Relative Afferent Pupillary Defect (RAPD)




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### How do you look for a Relative Afferent Pupillary Defect?

- ▶ RAPD = Sensory defect (Ex: optic neuropathy)
- ▶ Blown pupil = Motor defect (Ex: CN III palsy)

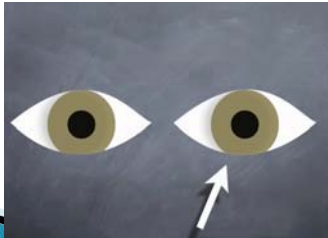


Image Acknowledgement: Sam Tapsell KAISER PERMANENTE

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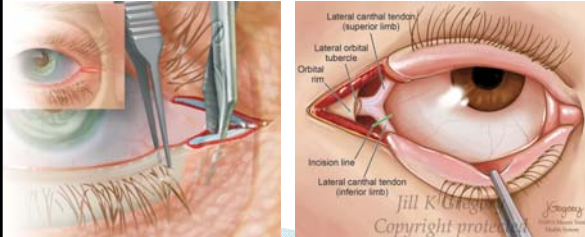
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## Acute management of orbital compartment syndrome

- ▶ Canthotomy + Cantholysis
  - (not intraocular pressure lowering eyedrops)



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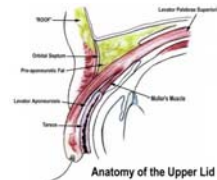
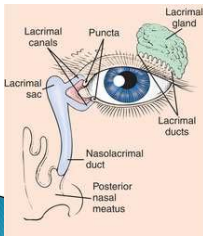
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## Eyelid laceration

- ▶ Involving canaliculus?
- ▶ Involving septum?



Liang X, et al. Eye. 2012.



Anatomy of the Upper Lid

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## Canalicular repair



Image Acknowledgement: Oculist  
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## Chemical Burn

- ▶ Check the pH - is it alkali?
- ▶ Morgan Lens Saline Irrigation - until pH is 7
- ▶ A "white eye" is actually *worse!*



COURTESY OF SALIM BILAL, MD

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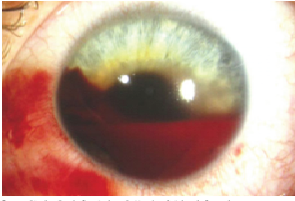
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## Hyphema

Careful if history of Sickle Cell!  
(may need to order Sickledex)



Source: Brandon Paul P. Cunningham, D. Vaughan & Ashby's General Ophthalmology, 4th Ed. Editor: <http://www.accessmedicine.com>  
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## Corneal Foreign Body

- ▶ Not just a simple abrasion
- ▶ Ensure no corneal laceration (seidel positive)


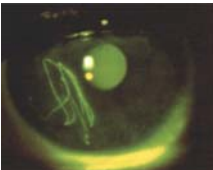



Image acknowledgment:  
Medscape, Eyerounds  
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### Patch or No Patch?

- ▶ Patching may help an **uninfected** cornea heal faster
- ▶ Patching an **infected** cornea makes it worse!

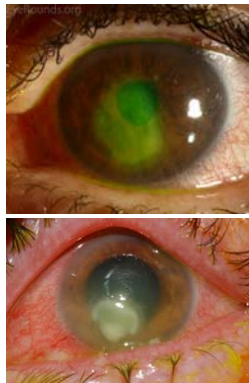


Image acknowledgement:  
Eyeworlds, Epocrates.  
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### Questions about traumatic emergencies?

- ▶ Ruptured Globe, Intraocular Foreign Body
- Orbital Fracture, Entrapment
- Acute Orbital Compartment Syndrome
- Eyelid, Canalicular Laceration
- Chemical Burn, pH
- Hyphema
- Corneal Foreign Body, Laceration



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### Duke Basketball



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## Nontraumatic Emergencies

- ▶ Neuro-ophthalmic
- ▶ Ocular



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## Neuro-Ophthalmic

- ▶ Carotid-Cavernous Fistula
- ▶ Cavernous Sinus Thrombosis

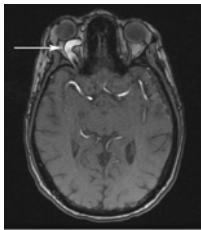
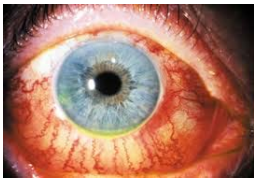


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## Neuro-Ophthalmic

- ▶ Pupil-involving CN III Palsy (PCOM Aneurysm)
- ▶ Horner's (Carotid Dissection)





Image acknowledgement:  
Slideshare- Behbehani, Physio-pedia  
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### Compressive Optic Neuropathy

- ▶ +RAPD
- ▶ Thyroid Associated Orbitopathy
- ▶ Orbital Mass
- ▶ Subperiosteal abscess from orbital cellulitis
- ▶ Mucormycosis

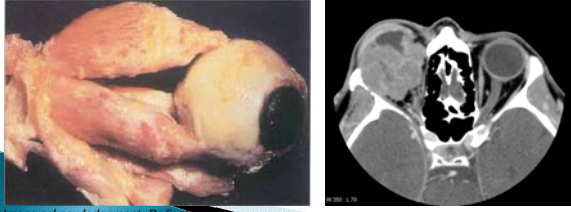


Image acknowledgement: Dr. F...

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### Giant Cell Arteritis

- ▶ > 50-60 yo
- ▶ Symptoms (Jaw claudication)
- ▶ Elevated ESR, CRP, Platelets

Normal ESR  
Men: age / 2  
Women: (age + 10) / 2

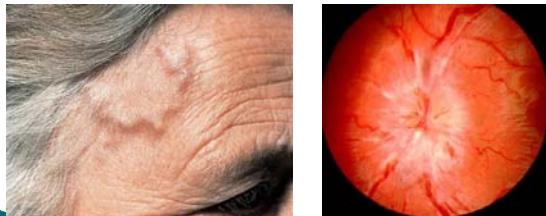


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### Ocular Emergencies

- ▶ Endophthalmitis
- ▶ Infectious Keratitis
- ▶ Corneoscleral Melt
- ▶ Severe Dry Eye
- ▶ Gonococcal Conjunctivitis
- ▶ Retinal Detachment
- ▶ Retinovascular Disease (CRAO, CRVO, OIS)
- ▶ Necrotizing Ocular Infections
- ▶ Acute Glaucoma



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## Endophthalmitis

- ▶ Exogenous > endogenous



*Image acknowledgement:*  
AAO, Review of ophthalmology  
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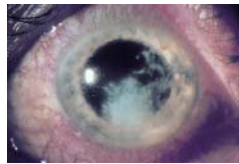
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## Infectious Keratitis

- ▶ Contact lens
- ▶ Trauma
- ▶ Immunosuppression



*Image acknowledgement:*  
Eyeworlds, AAO  
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## Corneoscleral Melt

- ▶ Underlying medical history
- ▶ 3-year mortality rate for scleritis associated with RA is 36-45% if not aggressively treated with immunosuppressive tx
- ▶ Rule out syphilis, TB



*Image acknowledgement:*  
Eyeworlds  
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### Severe Dry Eye

- ▶ Stevens-Johnson
- ▶ Chemical Burn
- ▶ Sjogren's
- ▶ Pemphigoid
- ▶ Trachoma
- ▶ Graft vs Host



Mild Moderate Severe

*Image acknowledgement:*  
Hopkinsmedicine, Orlandoeyeinstitute  
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### Gonococcal Conjunctivitis



*Image acknowledgement:*  
Studyblue  
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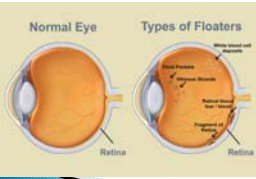
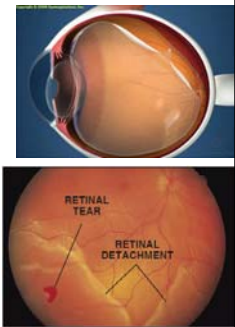
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
### Retinal Detachment

- ▶ Rhegmatogenous vs Serous
- ▶ Location
- ▶ Scarring
- ▶ Prior eye surgery



Normal Eye Types of Floaters

*Image acknowledgement:*  
meadowsretina, atlantiseyecare, mvretina  
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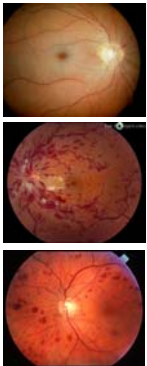
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### Retinovascular Disease

- ▶ Central Retinal Artery Occlusion
  - Thromboembolic workup
- ▶ Central Retinal Vein Occlusion
  - Thrombus, HTN, hypercoagulable
- ▶ Ocular Ischemic Syndrome
  - Carotid US (stenosis or occlusion)

Image acknowledgement:  
Coloradoretina, Eyeworld.com  
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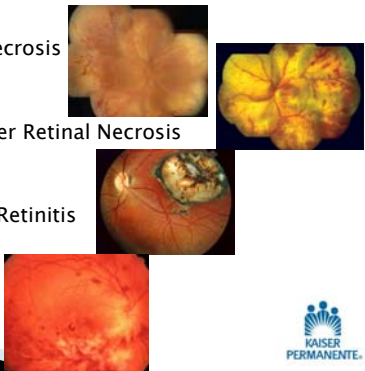
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### Necrotizing Ocular Infections

- ▶ Acute Retinal Necrosis
- ▶ Progressive Outer Retinal Necrosis
- ▶ Toxoplasmosis Retinitis
- ▶ CMV Retinitis

Image acknowledgement:  
Retinalphysician, NIH,  
UChicago, Emedicine  
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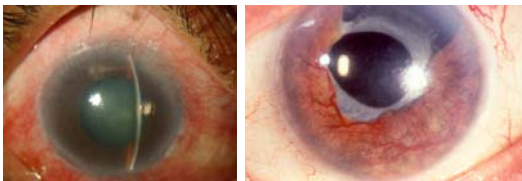
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### Acute Glaucoma

- ▶ Open vs Closed are categories, but there are > 40 different types!

Image acknowledgement:  
Eyeworld, westcoastglaucoma  
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## Questions?

### Neuro-Ophthalmic Emergencies

- ▶ Carotid-Cavernous Fistula
- ▶ Cavernous Sinus Thrombosis
- ▶ Pupil-Involving CN III Palsy (r/o PCOM Aneurysm)
- ▶ Horner's syndrome with headache (carotid dissection)
- ▶ Compressive Optic Neuropathy
- ▶ Giant Cell Arteritis

### Ocular Emergencies

- ▶ Endophthalmitis
- ▶ Infectious Keratitis
- ▶ Corneoscleral Melt
- ▶ Severe Dry Eye
- ▶ Gonococcal Conjunctivitis
- ▶ Retinal Detachment
- ▶ Retinovascular Disease (CRAO, CRVO, OIS)
- ▶ Necrotizing Ocular Infections
- ▶ Acute Glaucoma



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## Summary: Key Clinical Recommendations

- ▶ Approach an eye patient by classifying the patient as traumatic vs non-traumatic
- ▶ For chemical burn patients, care is guided by the pH
- ▶ Relative afferent pupillary defect is a clue for vision loss from optic neuropathy (helpful for trauma and for neuro-ophthalmic emergencies); RAPD is different from "reactive pupils"
- ▶ Think GCA for anyone over 60 years old with vision problem



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## References

- ▶ American Academy of Ophthalmology, Basic and Clinical Science Course
- ▶ The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease
- ▶ Eye Rounds, University of Iowa



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Thank You!



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