BLINK!

A rapid review of ophthalmology (the PANCE/PANRE ocular blueprint)

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AAPA 2021

Disclosures

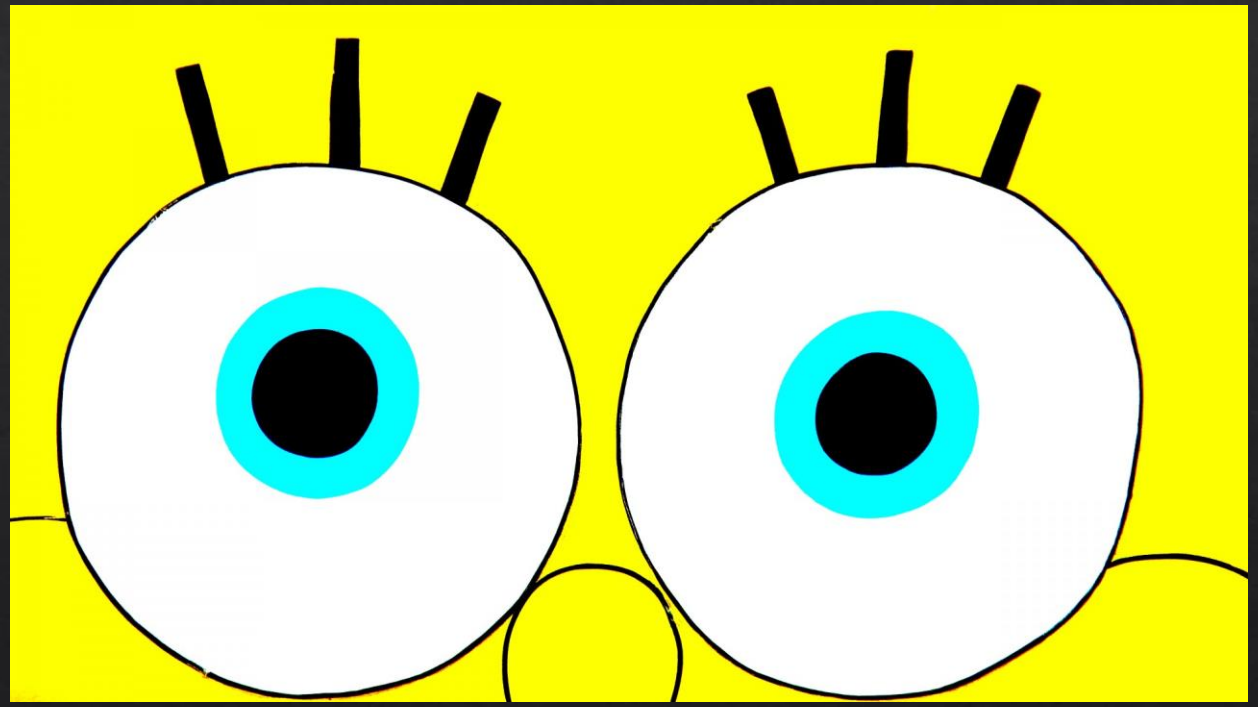
- Tara McSwigan has no professional affiliations nor financial interests to disclose pertaining to this topic.

Objectives

- Execute a quick and accurate ocular history and physical
- Identify a host of eye pathologies and presentations
- Successfully answer anticipated ocular questions on PANCE/PANRE

Blink…and think!

- Often intimidated by eyes? NOT necessary with methodical approach
- Systematic exam = successful evaluation = superior patient care AND board scores!!

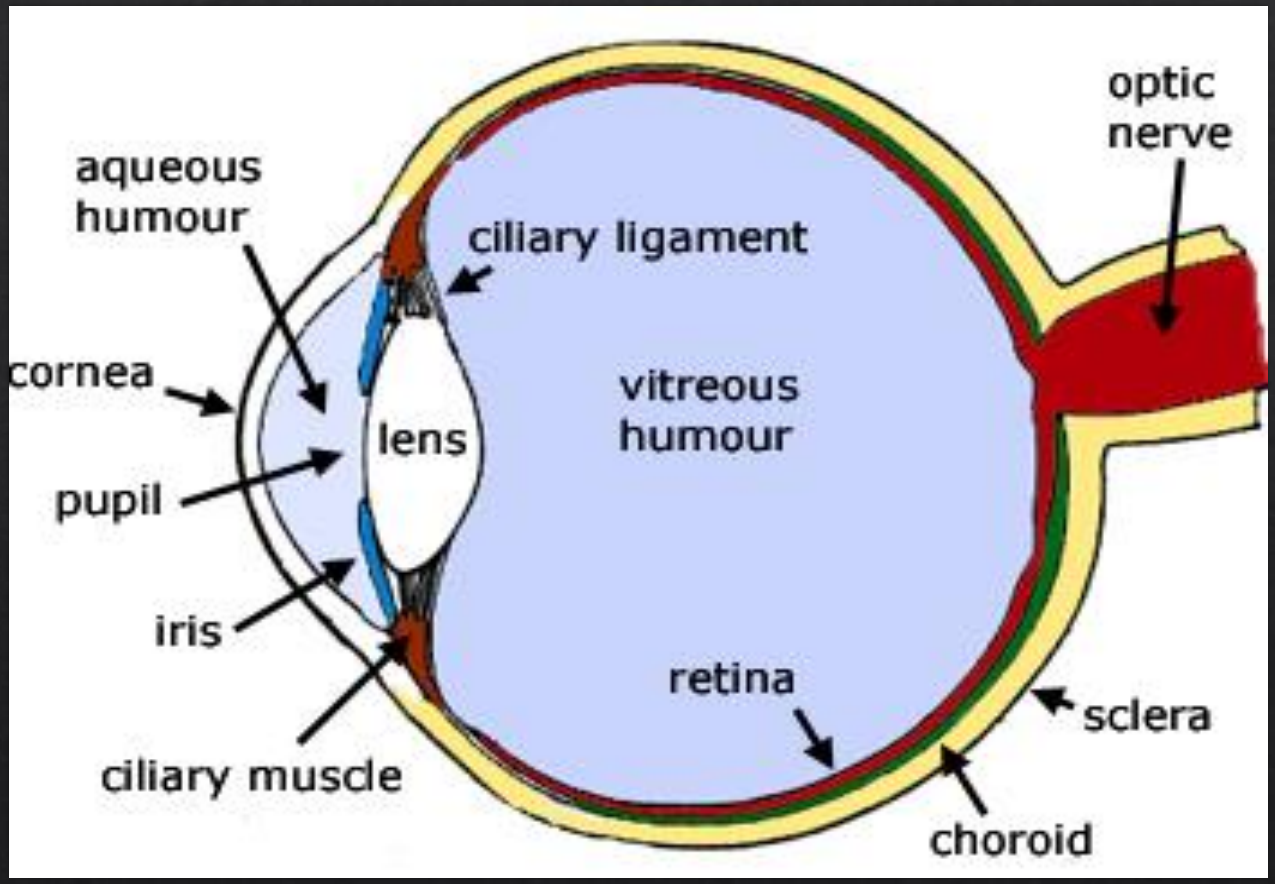


Fast Approach…

- History
  - Patient tells us what is wrong if we really listen
  - Painful condition? Anterior etiology
  - Painless visual change? Posterior and BAD!!

Fast Approach…

- Physical
  - Vision?!?!
  - Evaluate anterior to posterior, every single time, methodical and consistent



http://www.a-levelphysicstutor.com/images/optics/eye-diagram.jpg

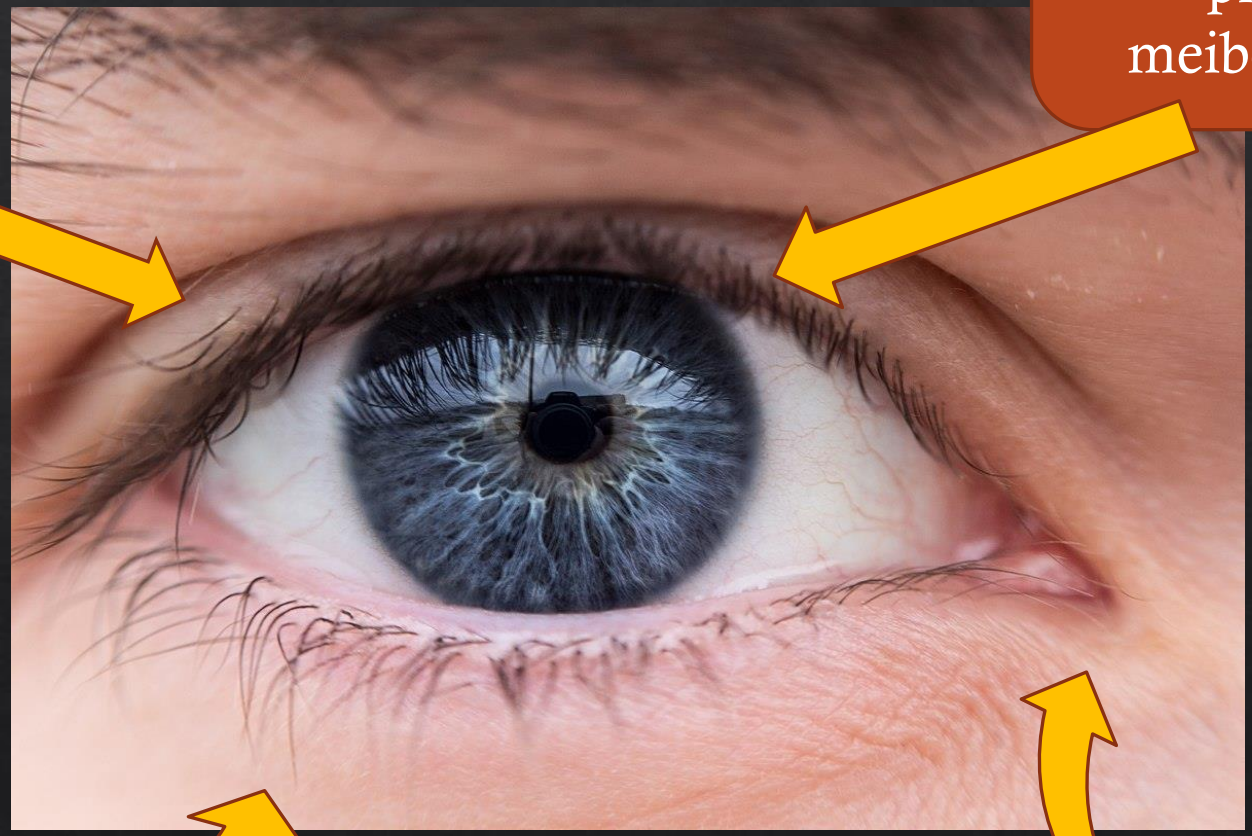
Now…

…around the “globe” in (about) 41 minutes!!

EXTERNAL

Lacrimal gland

Lid margins: including soft tissues, tarsal plates, oil & meibomian glands

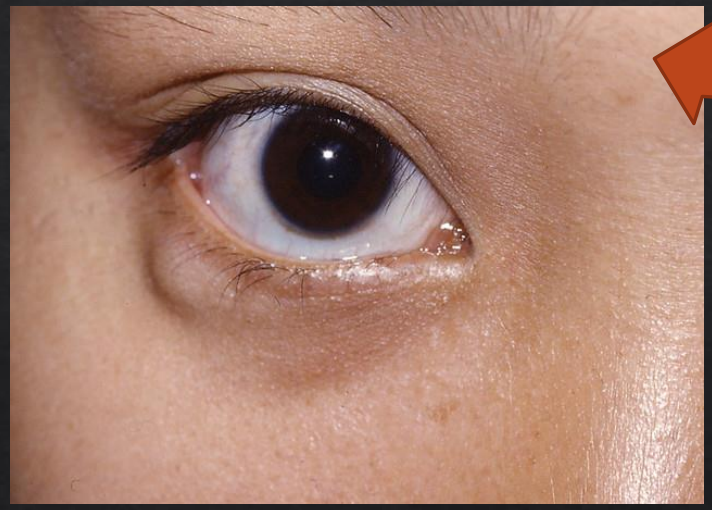


Surrounding soft tissues/orbital and periorbital

Lacrimal puncta/lacrimal duct

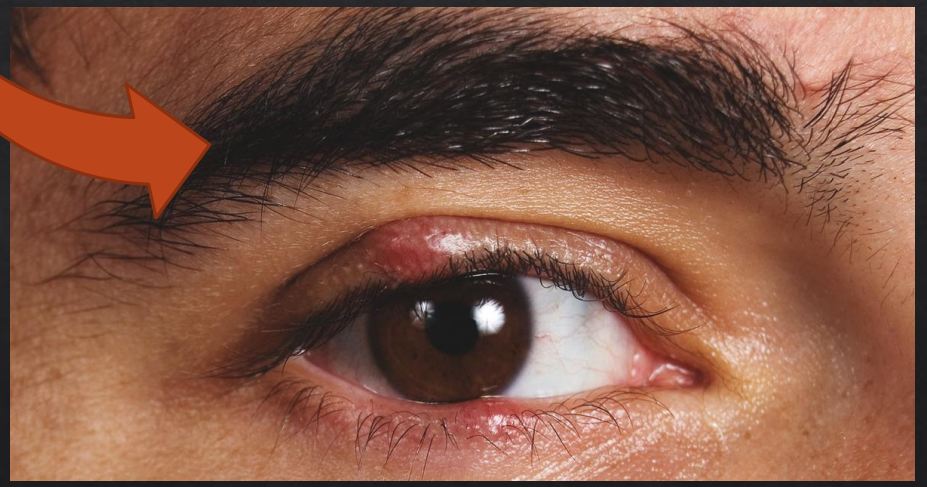
External: Chalazion and Hordeolum

- Inflamed/occluded meibomian gland, presents as painless lump NOT on lid margin



- Benign, spontaneous resolution, cortisone injection?

- Inflamed/occluded oil gland, painful red swelling ALONG lid margin



- Moist heat, occasional topical antibiotics (tobramycin, polytrim)

External: Blepharitis

- 3 major types:
  - Seborrheic: dermatitis of lid
  - Meibomian gland dysfunction: accumulation in gland
  - Staphylococcal: a stye gone awry!

Manual removal of scales, aided by baby shampoo

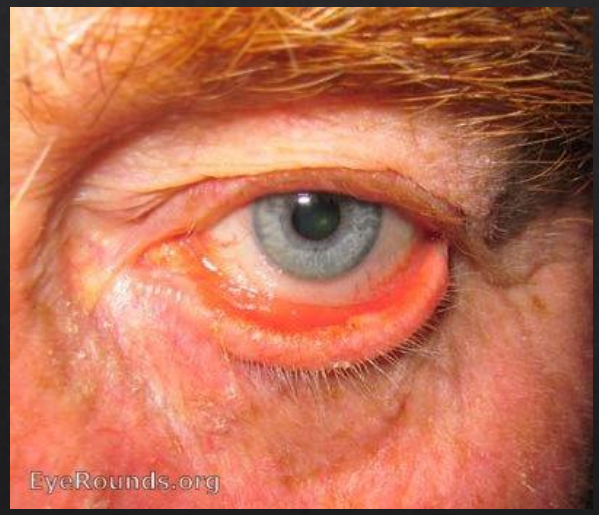
Manual expression of glands

Warm/moist compresses, sometimes topical antibiotics

External: Entropion & Ectropion

- INWARD folding of either lid, more often lower; rubs/irritates cornea

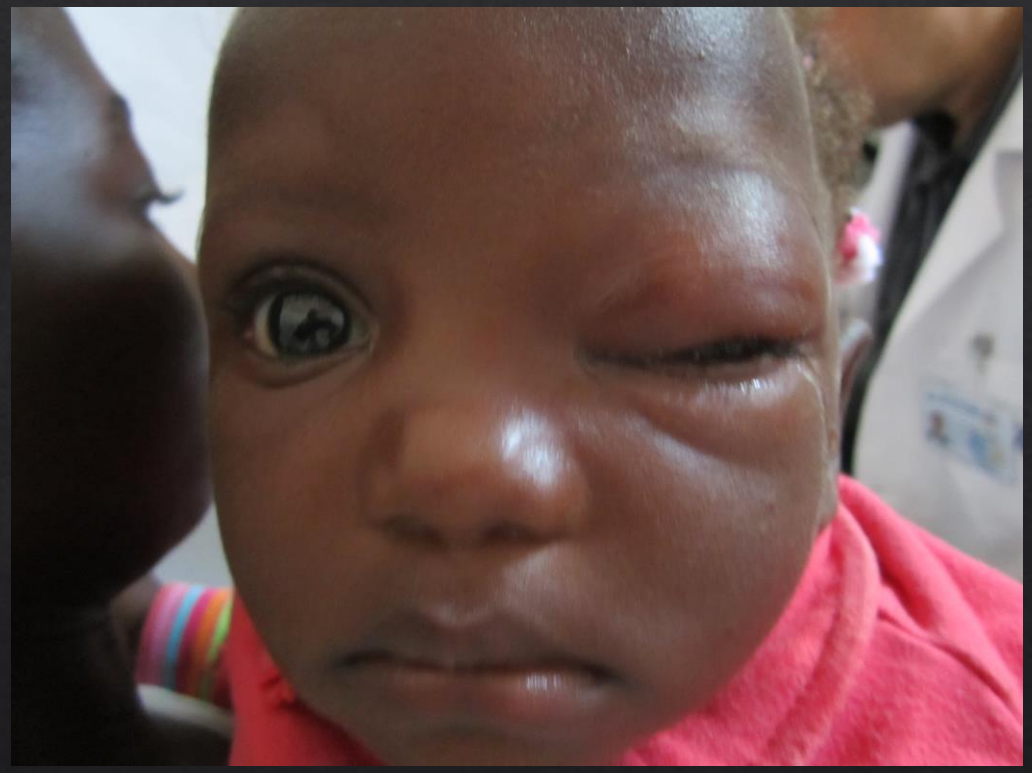
- OUTWARD drooping of lid/eye not fully closing? Secondary dryness, conjunctivitis



***both treated with topical ointments, artificial tears, and/or surgery

External: Orbital Cellulitis

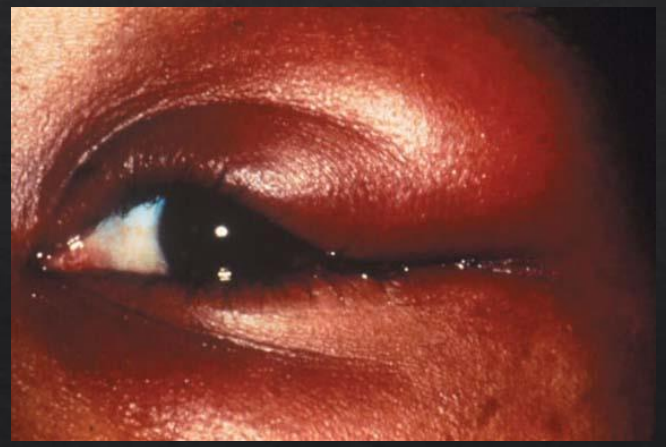
- Soft tissue inflammation extending into peri-orbital and/or orbital structures
  - bacteria (staph, strep) from sinuses
- IN, AROUND, & BEHIND ocular structures!!
- Exam: erythema, swelling, proptosis, "cement globe"



***enhanced facial CT, labs, IV antibiotics, admission: EMERGENT!!

External: Dacryoadenitis & Dacryocystitis

- Inflammation of lacrimal gland with redness and edema
- Viral, bacterial, systemic?



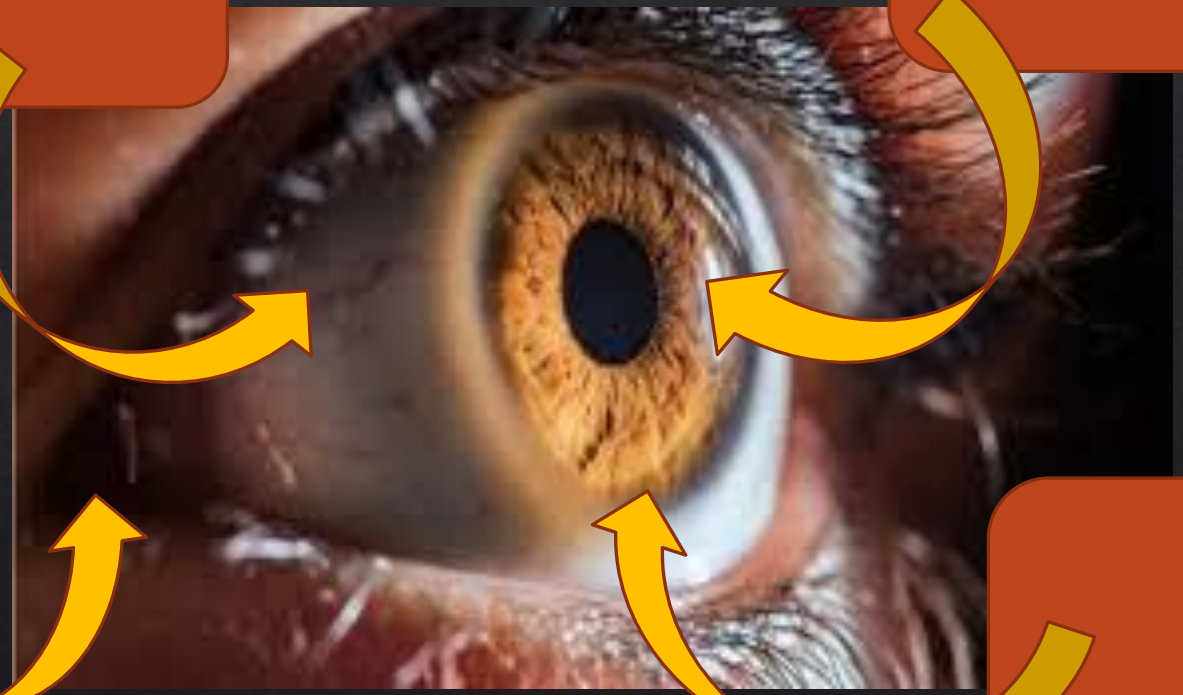
- Inflammation/occlusion of lacrimal duct: redness, edema, ++ “tearing”
- Mechanical, infectious

***compresses, antibiotics: remember MRSA!! (so augmentin vs doxycycline?)

MID-EYE

Bulbar conjunctiva

Corneal dome
Anterior chamber
Lens

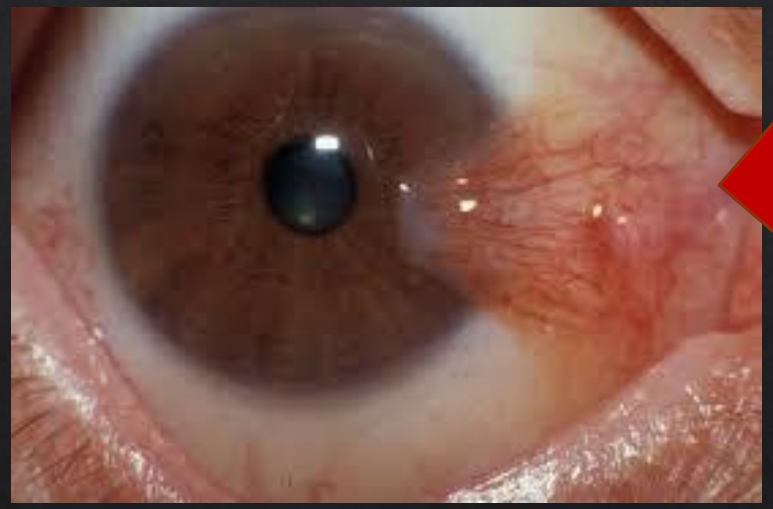


Medial canthus

Iris
Limbus

Mid-eye: Pterygium & Pinguecula

- Triangular growth of conjunctiva, usually medial/nasal surface, can extend to cornea



- Yellowish and slightly raised conjunctival lesions, usually lateral/temporal surface

***treated with artificial tears/drops or surgery

Mid-eye: Conjunctivitis

- 3 major types:
  - Allergic
  - Viral
  - Bacterial

Environmental trigger, associated symptoms
Cobblestone conjunctiva
Antihistamines!

Usually adenovirus/"eye" cold
Diffuse injection
Supportive!

Uncommon (except contacts)
Purulent and limbal sparing
Antibiotics (quinolone if contacts)

Mid-eye: Scleritis

- Inflammation of the avascular sclera, 90% anterior
- Often associated with autoimmune/systemic inflammatory pathology
- Severe, boring pain, worse at night
- Reddened, violaceous sclera, edema and pain

Work-up and treatment to consider host of underlying causes

Scleritis | Johns Hopkins Wilmer Eye Institute (hopkinsmedicine.org)

Mid-eye: Keratitis

- Inflammation of the corneal epithelium
- May be infectious, or insults (ultraviolet exposure)
- Red and painful eye, "foreign body" sensation
- Vision often affected (if central visual axis compromised)

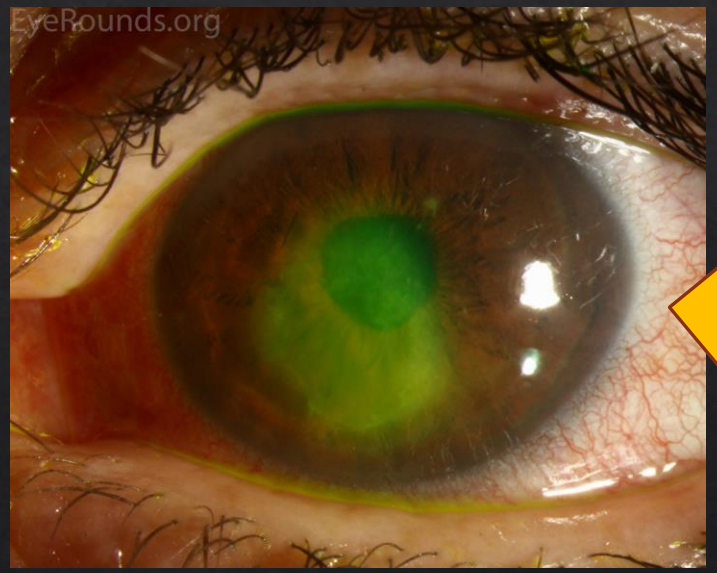
UV keratitis
Diffuse punctate injury
Empiric antibiotic drops

Herpes keratitis
Denditic lesions
Oral/topical antivirals

http://www.artisanoptics.com/Herpes%20Simplex%20Keratitis.jpg

Mid-eye: corneal abrasion & ulceration

- Mechanical scratch of corneal cells
- Stain/woods lamp to visualize



- Infectious erosion of cornea/contact users
- Classic defined opacification

https://www.eyecenters.com/wp-content

**either may affect vision if central visual axis
**antibiotics: any if abrasion, pseudomonal coverage if ulcer
**ophthalmology referral

Mid-eye: Foreign Body

- History very telling: thorough exam very necessary
- Corneal surface or under upper lid/tarsal plate
- Expect/examine for secondary abrasion
- Location determines removal technique
- Tetracaine? Tetanus?

Complications:
retained FB
rust ring
secondary abrasions
infection

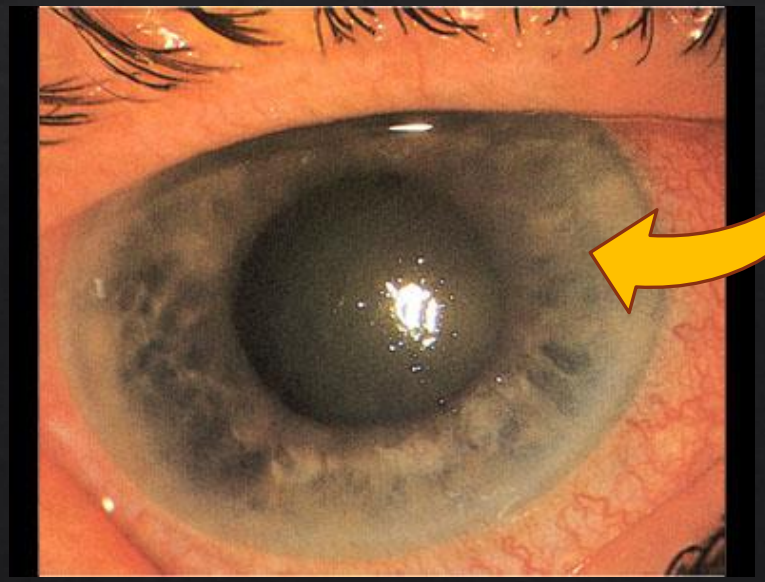
Mid-Eye: Glaucoma

- Increased intraocular pressure (IOP)/build of aqueous humor in anterior chamber with eventual posterior pressure = optic nerve injury!

Chronic?
Common cause of blindness because SLOW & SUBTLE loss of peripheral vision

Acute?
Abrupt occlusion of aqueous outflow = pain, pressure, vision loss within 3 days

- Treat acute by:
  - ↓ aqueous production
  - ↑ aqueous outflow
  - Laser iridectomy



Mid-eye: Hyphema

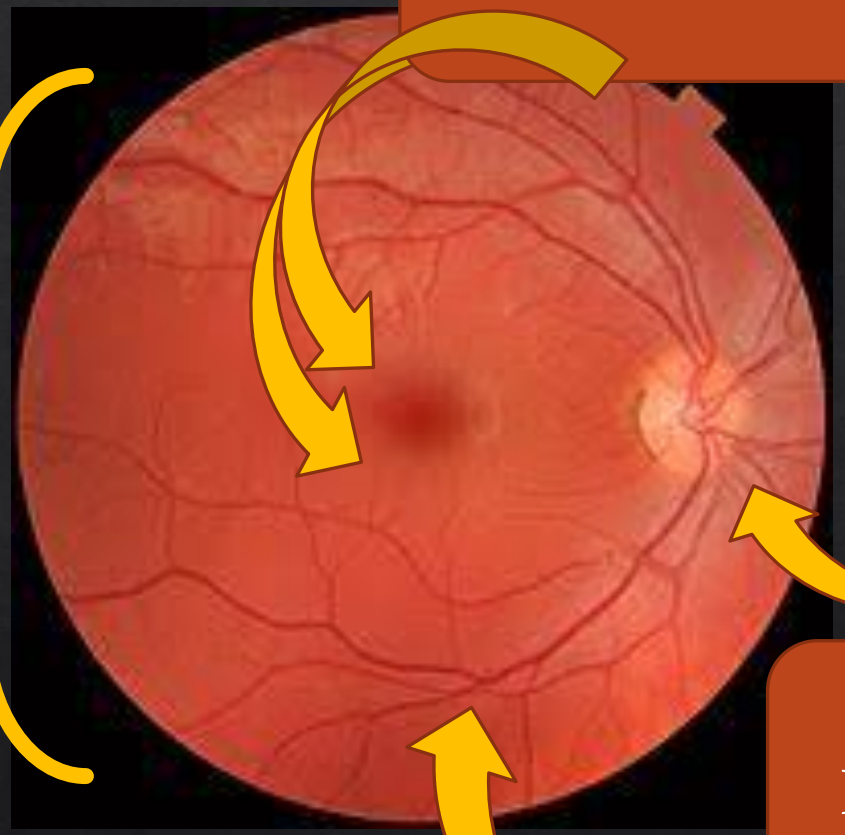
- Accumulation of blood in anterior chamber/almost always traumatic/bleeding ciliary muscles
- “Sunrise/sunset” sign
- Consider IOP, INR?
- Resolves with rest, may rebleed

https://i.pinimg.com/736x/14/42/68/1442683a7e6b2266a309c9cf8f473c6b--red-blood-cells-med-school.jpg

Mid-eye: Cataracts

- Opacification of actual lens
- Causes distorted/blurred vision, “halos” with light at night
- Causes: congenital, systemic disease, age related!!
- Treat with corrective lenses to lens replacement

POSTERIOR EYE



Fovea
Macula

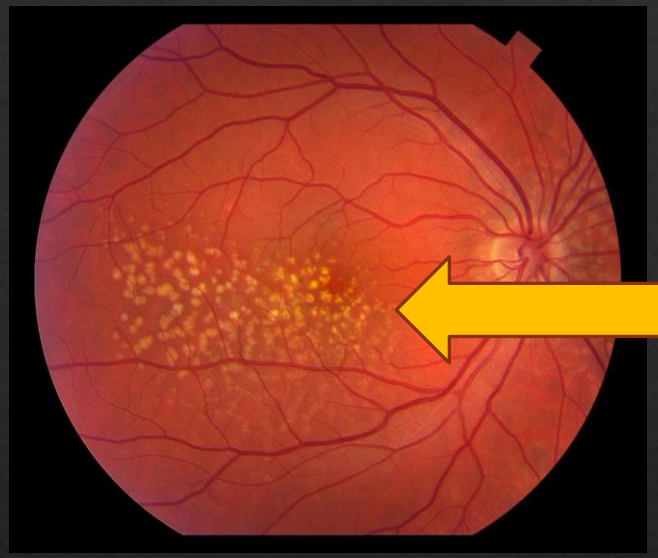
Retina

Optic disc
(entry optic nerve)

Retinal vessels

Posterior eye: Macular Degeneration

- "AMD" (age-related macular degeneration) is most common cause of central visual loss



"Dry" atrophic changes and fat deposits (drusen), hence slow progression

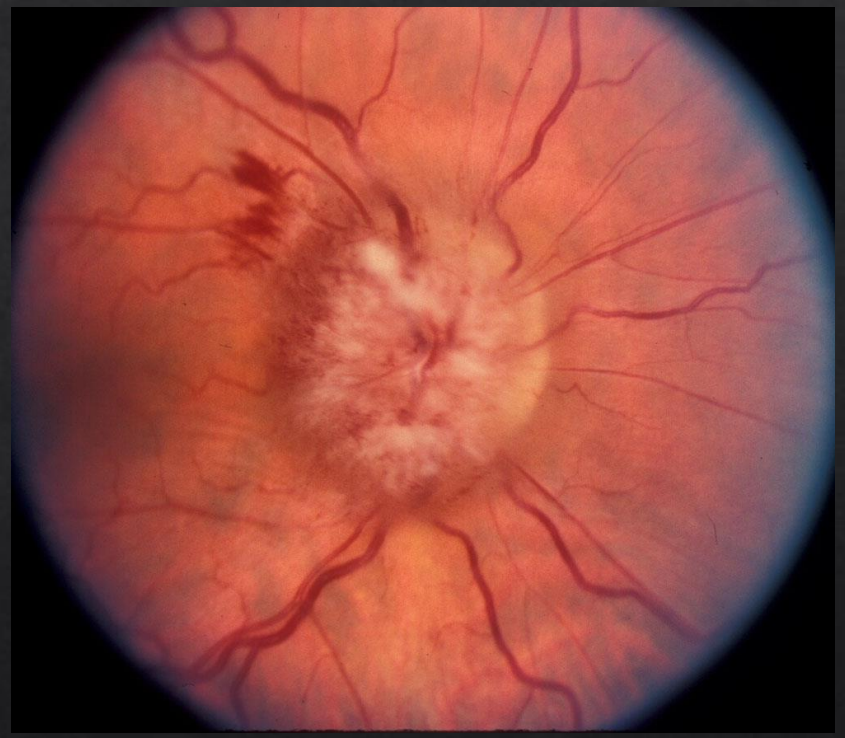
- Diagnosed with fundoscopy, treatment varies with severity

"Wet" leaky subretinal vessels grow

www.everydayhealth.com/macular-degeneration/wet-macular-degeneration/

Posterior eye: Papilledema

- Optic disc swelling secondary to raised intracranial pressure
- Concerning etiologies: masses, cerebral edema, hydrocephalus, pseudotumor
- **usually identified when patient assessed for other complaints of intracranial pressure (ie cephalgia)
- Typically bilateral



**Emergent consideration of underlying pathology!!

Posterior eye: Optic neuritis

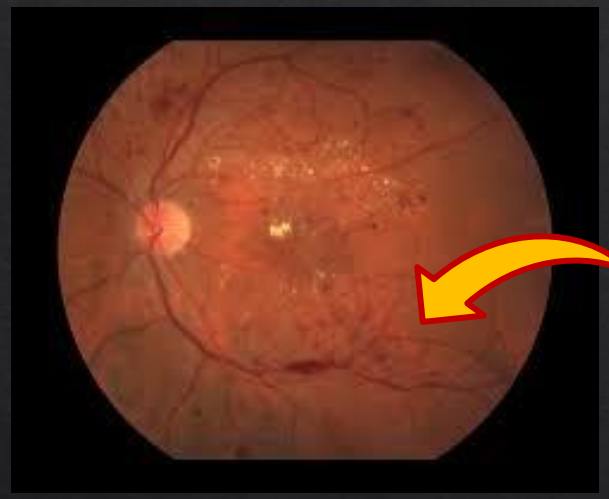
- Acute monocular vision loss, commonly associated eye pain
- Inflammation/demyelination of optic nerve, most associated with Multiple Sclerosis
- Women>>men, 20-40 yo
- Dx with contrast MRI

Vision typically starts to improve within weeks

Treatment acutely to involve high-dose steroid, but long term focus on MS management

Posterior eye: Retinopathy

- Visual change/loss secondary to macular edema, retinal thickening, vascular hemorrhage neovascularization



Cotton wool spots, microaneurysms

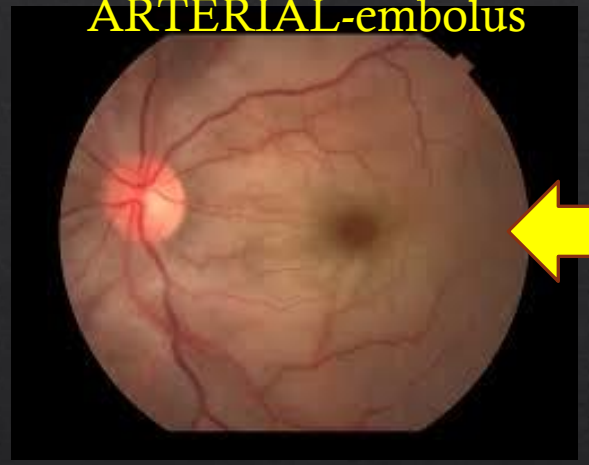
- Diabetic and Hypertensive: progressive eye injury with duration of disease, or lack of glucose/BP control

Flame hemorrhages, soft exudate

Posterior eye: Retinal vascular occlusion

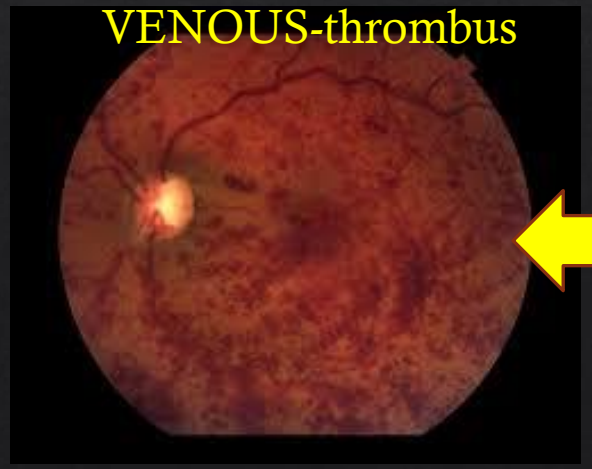
- Blockage of retinal vessel, arterial or venous, causing monocular vision loss
- Consider risk factors: CAD, DM, atrial fibrillation, endocarditis
- Blindness if not prompt/timely treatment

ARTERIAL-embolus



*pale fundus
*decrease IOP with meds or massage
**permanent blindness within 90 minutes!!!

VENOUS-thrombus



*retinal hemorrhages, engorged vessels, macular edema
*slower visual loss
*edema and panretinal laser treatment

Posterior eye: Retinal detachment

- Lifting/dissecting of retina from posterior eye wall
- Associated trauma, also spontaneous
- Preceding floaters of vitreous or light flashes
- "curtain/vein" dropping over vision
- Dx confirmed with fundoscopy and/or ultrasound

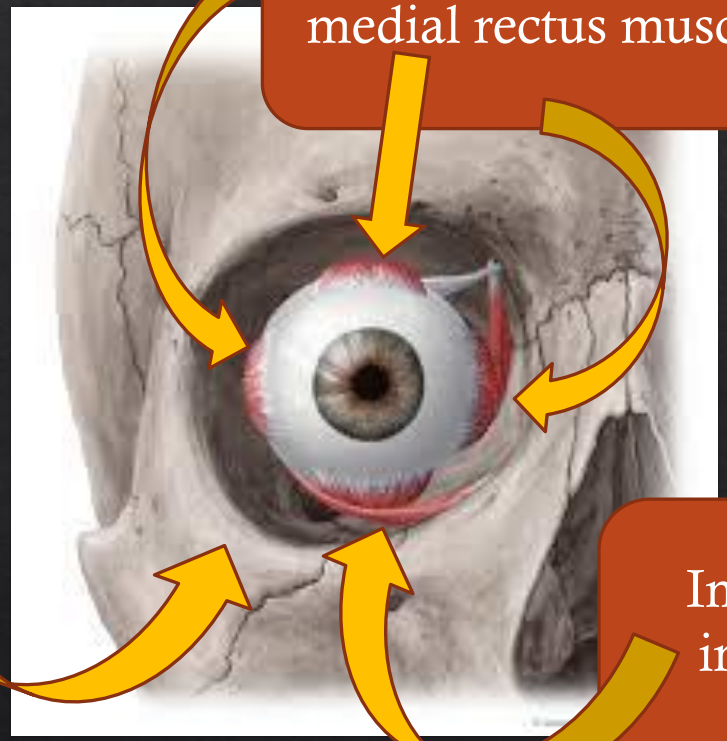
http://iahealth.net/wp-content

**treatment with vitrectomy, gas-fluid exchange or endolaser therapy

Posterior eye: Amaurosis fugax

- A history of transient visual loss that has resolved by time of patient presentation
- Exam is NORMAL
- Goal of workup to determine etiology/prevent recurrence or worse!

Mechanics!



Lateral, superior & medial rectus muscles

Infraorbital floor

Inferior rectus & inferior oblique muscles

Mechanics: Nystagmus

- Regular rhythmic oscillation of the eyes
- May be “jerk” or “pendular,” continuous or paroxysmal
- Horizontal, vertical, rotary
- Complaints of vertigo, blurred vision, oscillopsia
- Causes: congenital, asymmetry of vestibular inputs (acquired)

Treatment:
Medications
Botox injections
Prism lenses
Surgical

Mechanics: Strabismus

- Misalignment of eyes
- "Eso-" inward/nasal deviation relative to fixed eye
- "Exo-" outward/temporal deviation
- Family hx, neuromuscular conditions
- Evaluation with corneal light reflex, EOMs, cover/uncover test

Treatment with corrective lenses and/or surgical

https://allaboutvision.com%2Fconditions%2Fstrabismus

Mechanics: Amblyopia

- Functional reduction of visual acuity
  - Strabismic (abnormal alignment)
  - Refractive (unequal focus of eyes)
  - Deprivational (vision deprived, bad stuff)
- Determined by apparent malalignment, poor acuity, abnormal red reflex

"Lazy eye"

Treat with corrective lenses

Mechanics: Blowout fracture

- Facial trauma causing fracture to orbital floor
- Potential entrapment of inferior rectus muscle
- Gross swelling, ecchymosis, impaired EOM/limited superior motion?
- CT imaging of facial bones!!
- Surgical repair

What Is an Orbital Fracture? - American Academy of Ophthalmology (aao.org)

Mechanics: Globe rupture

- Blunt or penetrating trauma of eye
- Irregular pupil, “teardrop” points in the direction of injury
- Visual impairment!!
- Considered retained foreign body in globe
- CT imaging for evaluation

Whew!!

- Wasn't that fun?!
- Systematic keeps it simple!
- For your boards….and your patients… and the pride of the profession,

BLINK!

WE'VE GOT THIS!!!

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References

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