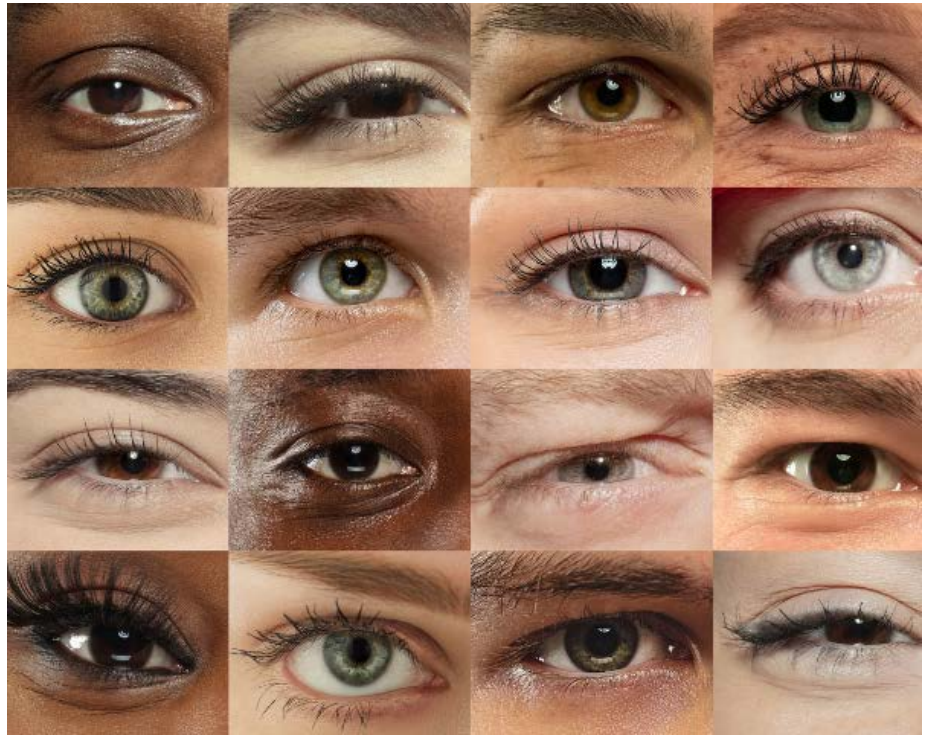


SOUTHWEST IDAHO AHEC
Students, Professionals, Community

Eyeballs for the PCP

PRESENTED BY: AMELIA SCHURKE, MD, THIRD YEAR FAMILY MEDICINE RESIDENT - FULL CIRCLE BOISE PROGRAM

DATE: 12/11/24

Accreditation & Disclosures

Accreditation Statement

In support of improving patient care, this activity has been planned and implemented by Southwest Idaho Area Health Education Cetner and the University of Idaho, WWAMI Medical Education Program. The University of Idaho, WWAMI Medical Education Program is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team.

Financial Relationship Disclosure to Learners

No one involved in planning or presenting this activity has any relevant financial relationships to disclose.

Objectives

- Review common eye diseases primary care providers encounter among their patient panel
- Review the evidence for standard ophthalmologic practices across the lifetime from newborn to geriatric patients
- Review associations between chronic diseases and specific ophthalmologic disease

Why this topic is important

- PCPs will frequently be the first touchpoint for eye concerns
- Comprehensive knowledge of the pathophysiology of ophthalmologic disease is important for proper counseling and anticipatory guidance of patients with chronic diseases that put them at higher risk for contracting ophthalmologic disease in the future
- We get very sparse training in ophthalmology but care for patients who have many chronic diseases that put them at risk for various eye diseases
- PCPs will be asked to refill eye-related medications, important to know what they are for and how to use them

- How does this impact AHEC's core topic?
  - Practice Transformation

Newborn-Pediatric

- Erythromycin ointment
- Dacryostenosis
- Conjunctivitis
- Amblyopia

Evidence for erythromycin

- Erythromycin ointment is applied to newborn eyes at birth for the prevention of ophthalmia neonatorum caused by gonorrhea or chlamydia, thereby reducing the risk of blindness from the infection
- Some evidence suggests that erythromycin reduces overall bacteria in the eye and may help to prevent ON from non-sexually transmitted bacteria like staph
- Erythromycin prophylaxis may be helpful if the mother and her partner(s) did not receive adequate screening and treatment for gonorrhea during the pregnancy and it's not possible to test the mother at the time of birth and treat the infant as needed
- Erythromycin prophylaxis may help to protect a newborn from gonorrheal ON if the mother was infected after a negative screening result earlier in the pregnancy (for example, due to a partner's infidelity)
- Adverse effects of the ointment can include chemical irritation or blurry vision
- Erythromycin is not 100% effective at preventing gonorrheal ON – it had a 20% failure rate in the past and might be less effective now due to growing resistance
- Alternative options:
  - Povidine-Iodine
  - Watch & wait
  - Colostrum

EVIDENCE BASED Birth®

Evidence that Empowers!

Evidence on: Eye Ointment for Newborns

By Rebecca Dekker, PhD, RN of EvidenceBasedBirth.com

Question: Why do newborns sometimes receive eye ointment immediately after birth?

Answer: Eye ointment is given to newborns to prevent pink eye in the first month of life, called *ophthalmia neonatorum* (ON). The ointment is meant to kill bacteria in the eye—mainly gonorrhea, a sexually transmitted infection. If left untreated, pink eye from gonorrhea can cause serious eye damage and blindness in as little as 24 hours.

Question: What causes newborn pink eye?

Answer: Pink eye can be caused by viruses, bacteria, chemicals, and blocked tear ducts. The most common cause of newborn pink eye is chlamydia, a sexually transmitted infection. The most serious type of newborn pink eye is from gonorrhea, which now causes less than 1% of cases. Pseudomonas bacteria can also cause severe eye infections, mostly occurring in intensive care units. Other bacteria (like staph and strep) from the mother, hospital, or home environment cause 30%-50% of cases—these cases are easily treated and not serious.

Question: Is erythromycin eye ointment effective at preventing newborn pink eye?

Answer: Researchers have found that erythromycin is about 80% effective at preventing pink eye from gonorrhea and might also offer some protection against pink eye from chlamydia. Evidence suggests that erythromycin might be effective at reducing overall bacteria in the eye and protect against pink eye from staph bacteria. However, the growing problem of antibiotic resistance (with gonorrhea, staph, and strep) means that erythromycin is probably less effective at preventing newborn pink eye today.

Question: Are there any other options?

Answer: There are other ways to prevent newborn pink eye.

- The pregnant person can be screened for chlamydia and gonorrhea and treated for a positive test result with antibiotics, along with the sexual partner(s)
- Eye drops of the mother's first milk have been shown to reduce newborn pink eye from staph bacteria.
- The mother could follow a wait-and-see approach, in which antibiotics are used only when necessary to treat an infection. Parents who decline eye ointment should seek immediate treatment for pus-producing pink eye.

Benefits of Erythromycin Eye Ointment:

- Has been shown to help protect against newborn pink eye from gonorrhea
- May offer some protection against less serious types of newborn pink eye from chlamydia and other bacteria picked up in the hospital and home environment, like staph
- Helps protect the baby if the mother had a negative screening test, but then got a sexually transmitted infection (such as due to a partner's infidelity)

Risks of Erythromycin Eye Ointment:

- Eye irritation, called chemical pink eye, can occur
- Blurred vision could interfere with bonding by disrupting early eye gazing between the baby and parents
- Erythromycin is only 80% effective at preventing newborn pink eye from gonorrhea and is probably less effective now due to growing bacterial resistance
- Group B Strep bacteria are becoming resistant to erythromycin, and there are also signs of resistance among staph bacteria

"Given the fact that other options can be used to safely prevent and treat newborn pink eye, parents should have the right to accept or decline routine eye ointment."

1. American Academy of Pediatrics (2018). In: Kimberlin, D. W., Brady, M. T., Jackson, M. A., eds. Red Book: 2018 Report of the Committee on Infectious Diseases.
2. Darling, E. K. and H. McDonald (2010). "A meta-analysis of the efficacy of ocular prophylactic agents used for the prevention of gonococcal and chlamydial ophthalmia neonatorum." J Midwifery Womens Health 55(4): 319-327.
3. Kapoor VS, Whyte R, Vedula SS. Protocol: Interventions for preventing ophthalmia neonatorum. Cochrane Database of Systematic Reviews 2016, Issue 9. Art. No.: CD001862.

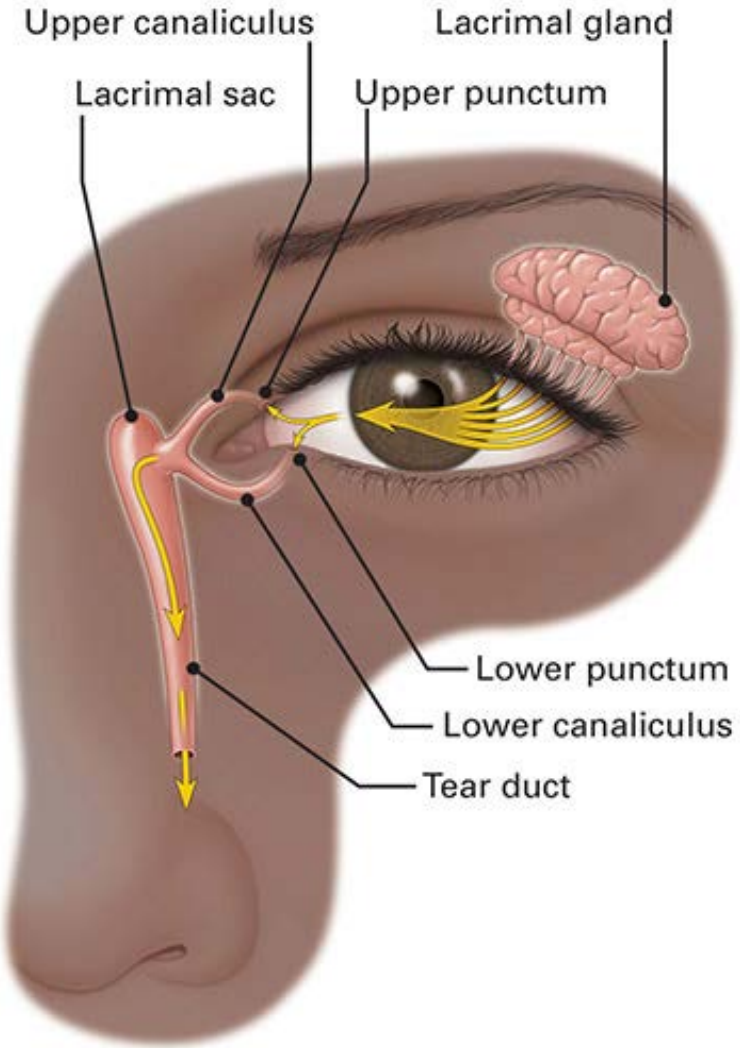
For more information visit **EvidenceBasedBirth.com/EyeOintment** /evidencebasedbirth @ebbirth

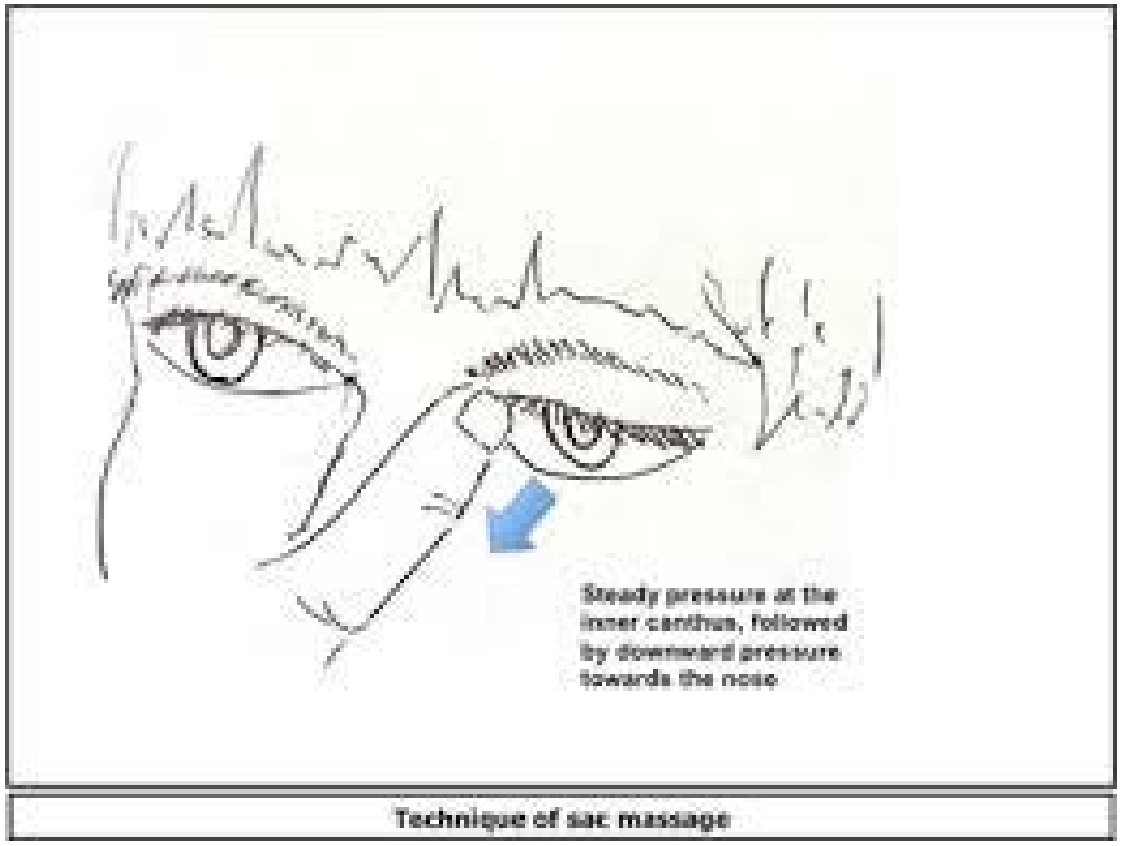
Erythromycin: PCP takeaway

- Evidenced Based Birth has an amazing free handout about newborn eye ointment!
  - https://evidencebasedbirth.com/wp-content/uploads/2019/11/Eye-Ointment-Handout-_v2019-draft01.pdf
- May offer some protection against less serious types of newborn pink eye from chlamydia and other bacteria picked up in the hospital and home environment, like staph
- Helps protect the baby if the mother had a negative screening test, but then got a sexually transmitted infection (such as due to a partner's infidelity)

Dacryostenosis

- Blocked tear duct, can be congenital or acquired. Lacrimal gland produces tears but the nasolacrimal duct is not patent leading to persistent tearing and ocular discharge
- Yellow sticky substance in corner of eye while the rest of the eye appears normal, can be confused with conjunctivitis (primarily concerned with ON < 1 month of life)
- Doesn’t manifest until about a few weeks old (lacrimal gland makes tears starting at 2 weeks old and then tear production gradually increases through 1-3 months of life)
- Common treatment is warm washcloths and massage to milk open the tear duct very rarely does the child require a surgery to probe the duct open
- Unilateral or bilateral, recurrent or intermittent





Technique of sac massage

Conjunctivitis

- We all know that majority of cases of conjunctivitis are caused by viral etiologies rather than bacterial
- We are trained to be very cautious about antibiotic prescription for conjunctivitis because most of the time it is unnecessary and doesn't shorten illness course or reduce symptomatology
- Age matters, <1 month concern for perinatally transmitted etiologies of conjunctivitis (chlamydia, gonorrhea) vs > 1 month (dacryostenosis, bacterial, viral)
- Viral conjunctivitis is more common in adults and is often preceded by URI symptoms
- Viral = watery, red eye, sequential infected eyes, prodromal URI sxs, serous discharge
- Bacterial = mucopurulent discharge, not always other URI symptoms, common to have concurrent AOM (look in their ears), eyes stuck shut
- Allergic = watery eyes, itchy
- Red flags (urgent ophthal referral): painful eyes, photophobia, persistent vision changes, anisocoria, corneal abnormality

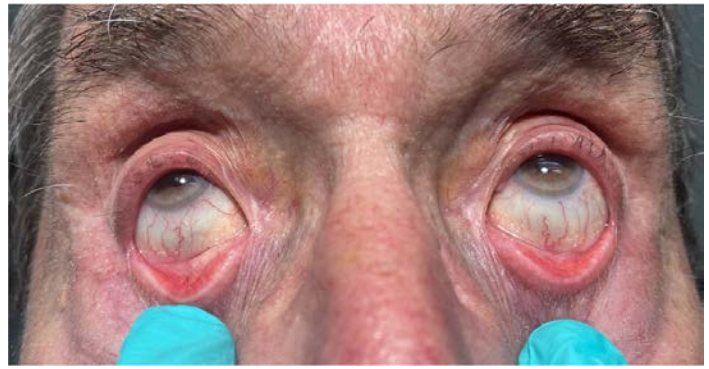
Evidence for conjunctivitis

- Cochrane Review (most recently updated in 2022)
  - Using antibiotics was associated with a modestly improved chance of resolution of sxs in comparison with placebo
  - Abx likely increase clinical cure and microbiological cure after a course of treatment in comparison with placebo
  - Also recommended considering more research into antiseptic treatments given growing abx resistance.
  - Placebo vs abx group – spontaneous resolution at day 4-9 in placebo occurred at a higher rate in placebo group vs antibiotic group (55 vs 68%)
- Reality = most kids need a prescription to be able to return to school
- Most common bacteria that causes bacterial conjunctivitis in pediatric pts > 1 month old is Hemophilus influenza, for adults it is staph aureus


A


B


C



Conjunctivitis: PCP takeaway

1. "Age is an important diagnostic clue, given that 71% of conjunctivitis cases in children are bacterial, and 78% of cases in adults are viral." - AAFP Article 2024
2. Contact lens wearers should always be treated with antibiotics, encouraged to discard of their contacts and not wear contacts until treatment is completed.
3. Know your red flags and when to immediately refer to ophthalmology: pain, photophobia, persistent vision changes, anisocoria, corneal abnormality
4. Counsel on reducing transmission with vigorous hand hygiene!

Amblyopia

- Amblyopia ("lazy eye") is a neurodevelopmental disorder that arises from abnormal processing of visual images that leads to a function reduction of visual acuity
- Leading cause of childhood monocular vision loss, responsible for permanent vision loss in 2.9% of adults
- Usually unilateral, can be bilateral

Evidence for amblyopia

- Treatment includes either patching the stronger eye or using atropine drops to blur vision in the stronger eye
  - Atropine 1% ophthalmic drops block parasympathetic innervation to the ciliary muscle and pupil, causing temporary paralysis of accommodation (cycloplegia) and dilation of the pupil. This results in blurring in the nonamblyopic eye and inability to focus at near distance, thus stimulating the preferential near fixation of the amblyopic eye and subsequent visual improvement.
- Cochrane review (2019) found no difference in improving visual acuity in short term and in the long term between the two treatment options
- AAFP article reported patching for 1-2 hours a day led to similar results as patching for 6 hours a day
- The younger the condition is detected the more beneficial the results, < 7 years old is ideal

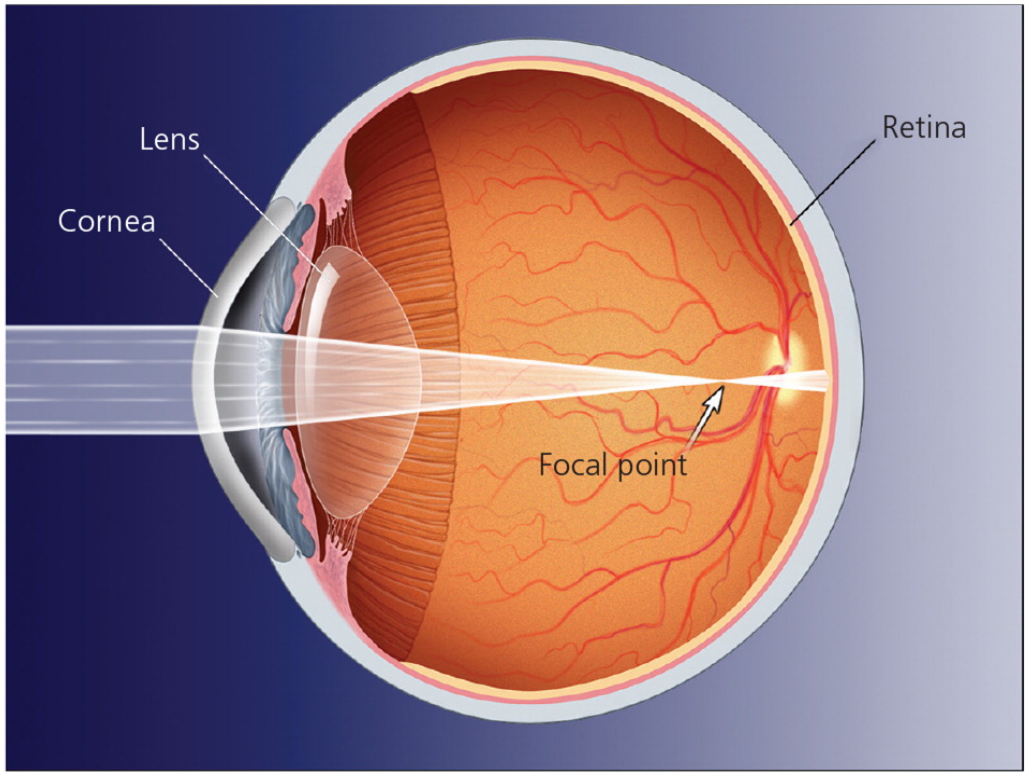
Amblyopia: PCP takeaway

- Thorough history taking and exam
- Pearls from history: wandering eye, head tilting, nystagmus, strabismus, eye tracking?
- Exam: RRR, EOMI when able to
- Vision screening: vision testing should be performed in children ages 3 and older, Go Check Kids (mobile app that evaluates presence of refractive amblyopia)
- Treatment options: atropine drops, patching, occlusion foil/patch/Bangerten filter

The Adult

- Myopia
- Ptyergium
- Diabetic retinopathy

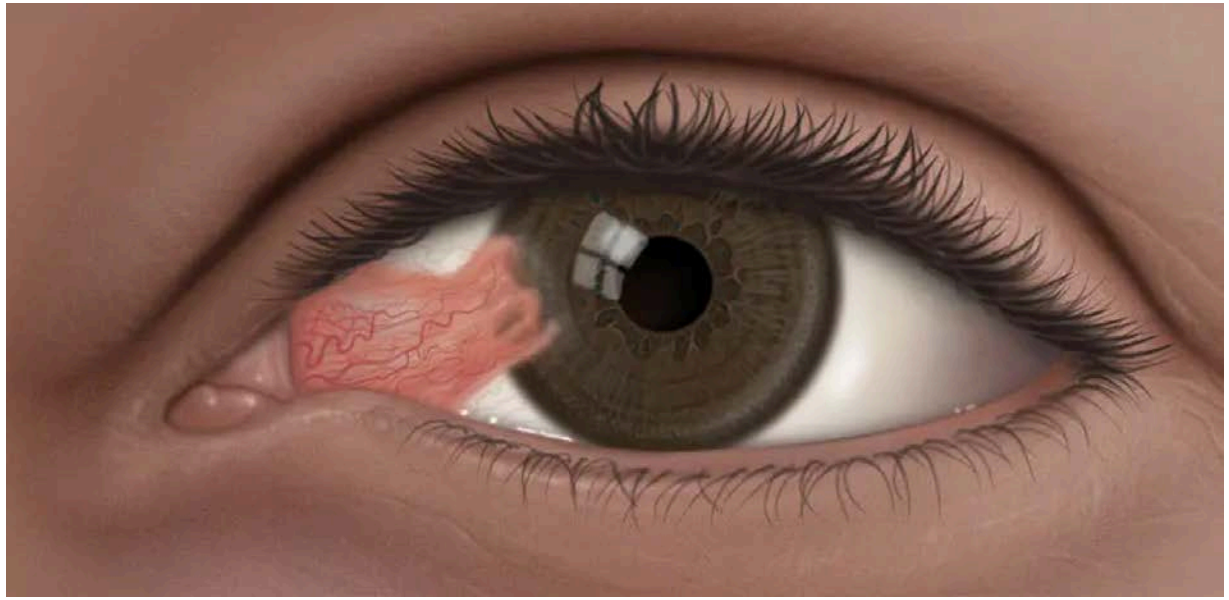
Myopia



- Myopia (nearsightedness), the eye is too long and images are focused at a point in front of the retina.
- Caused by numerous environmental and genetic factors leading to progressive axial elongation
  - One of the biggest risk factors for juvenille onset myopia is more time spent doing "near work" like reading
- Corrective contact lenses, corrective lenses, surgery
- LASIK surgery decreases the curvature of the cornea by removing tissue from the center which corrects for myopia by moving the focal point back to the exact center of the retina resulting in 20/20 vision or "emmetropia"

Ptyergium

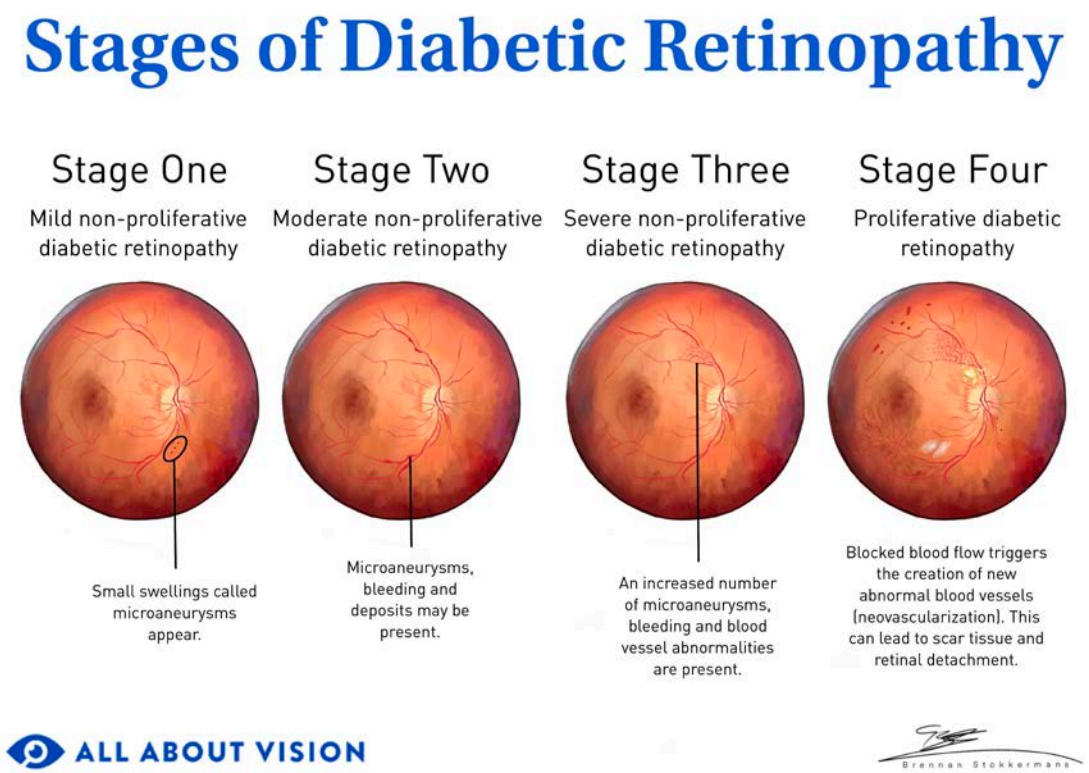
- Fibrovascular degenerations of the conjunctiva that advance across the cornea over time
- Risk factors for ptyergium: male sex, UV light exposure, increasing age
- No treatment until visual acuity is impacted by ptyergium growing into cornea
- Surgery is usually the intervention, excision with conjunctival auto-graft

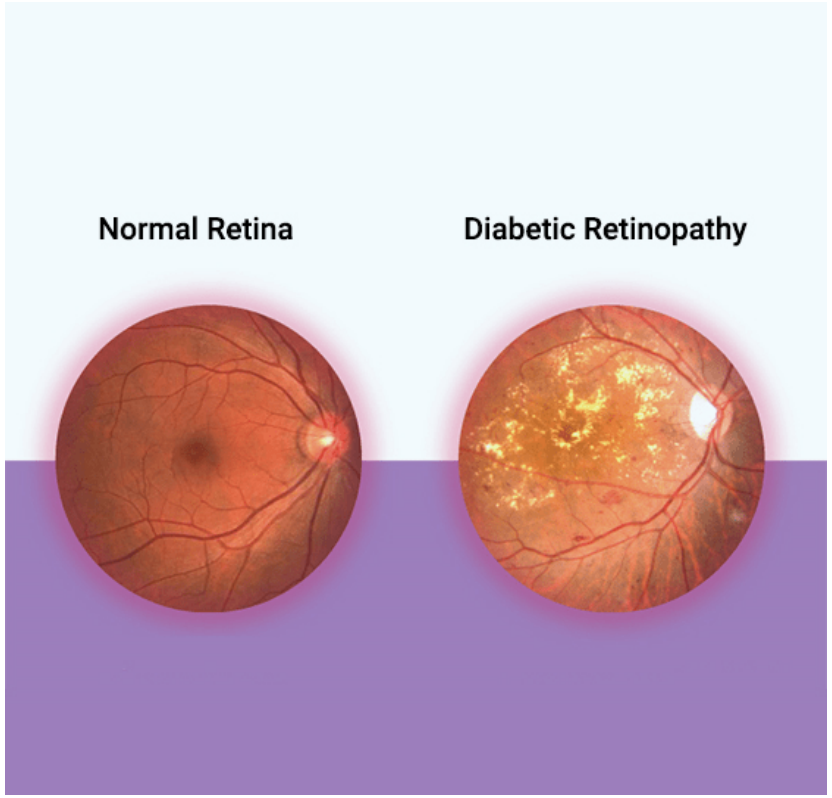


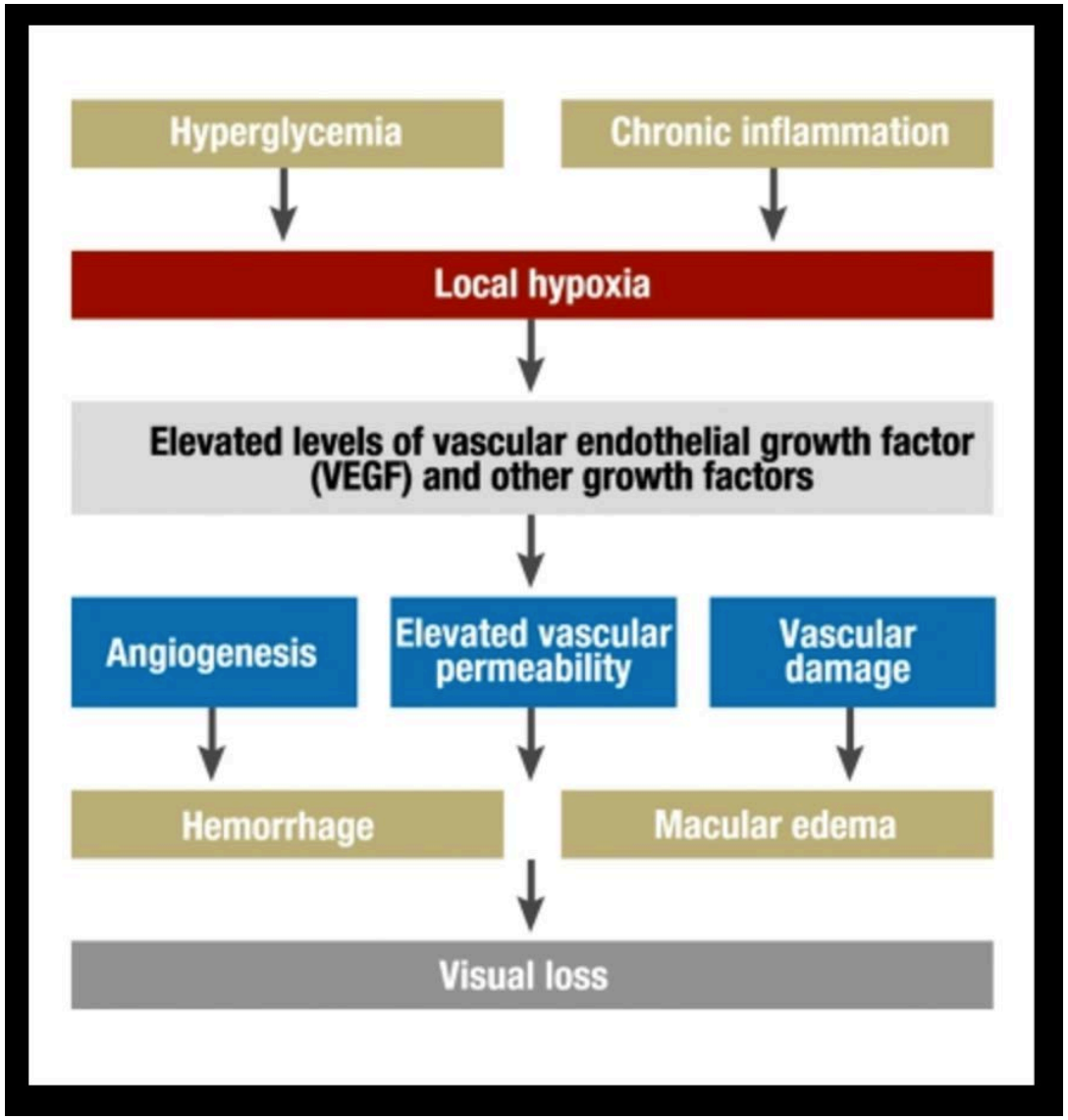
Ptyergium: PCP takeaway

- Primary prevention (UV blocking sunglasses) important for prevention of ptyergium in the first place
- Recognition of what ptyergium look like and when they become a problem and need referral to ophthalmology

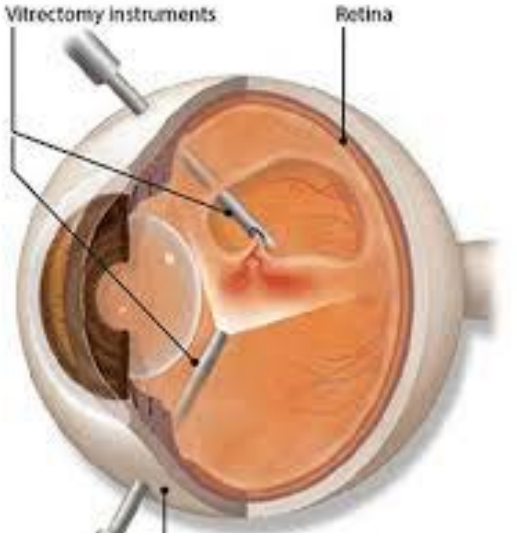
Diabetic retinopathy







- Non-proliferative vs proliferative types of retinopathy
- Non-proliferative can transform into proliferative
- Anti-VEGF agents can be used to stabilize disease and allow time to perform panretinal photocoagulation
- Anti-VEGF agents are monthly intravitreal injections (eyeball shots)
- Vitrectomy



Evidence for diabetic retinopathy

- Cochrane review (2023) found that risk factors for developing proliferative diabetic retinopathy include:
  - Age of diagnosis (younger = more at risk)
  - Higher triglyceride level
  - Higher Hgb A1C
  - Renal impairment

Diabetic retinopathy: PCP takeaway

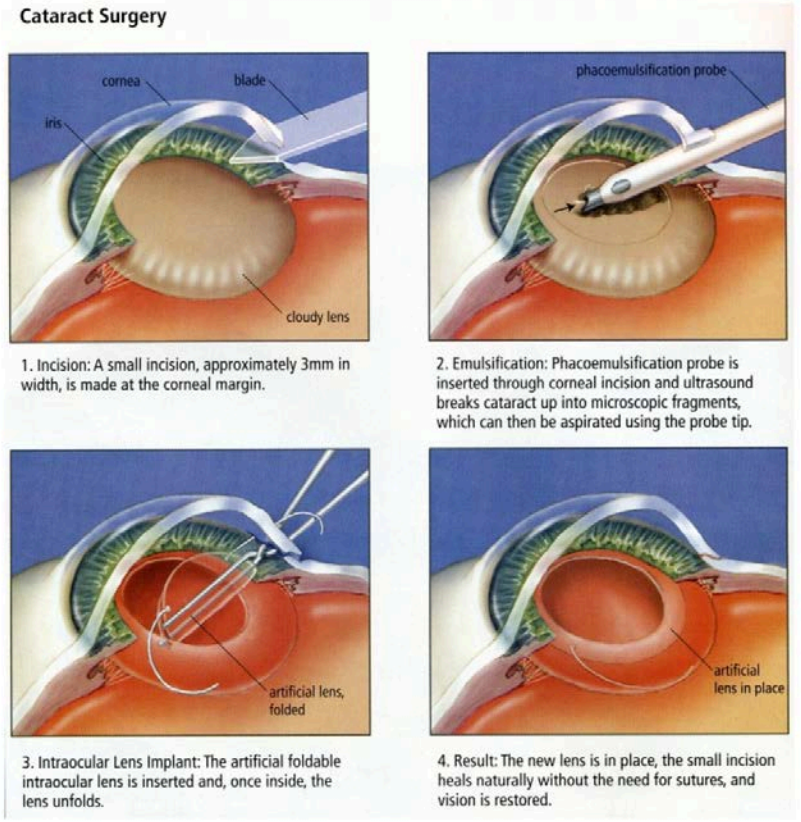
- Education, teach-back!
  - Consider creating a short video or a pamphlet that you give to each patient who you are seeing for a diabetes visit. Ask them to watch or read the pamphlet before you see them for that visit. Discuss diabetes' impact on all of the body systems including the eyes.
  - Refer to diabetes educator or establish one in your own clinic (delegate this education to another person on your care team – CMA or RN/LPN!)
- Annual eye exams
- Reiterate diabetes impact on all of the organ systems at every visit

The Older Adult

- Cataracts
- Glaucoma
- Dry eyes

Cataracts

- Opacification of the lens
- Risk factors: diabetes, genetics, UV light exposure
- Congenital cataracts (Rubella, CMV, varicella, herpes simplex, alcohol, CHARGE syndrome, T13/18/21)
  - In pediatric cases surgery has to happen within 6-10 weeks after birth before final vision is affected
  - SUPER important to assess red light reflex in newborns, make sure it is in a darkened room or bring babe from horizontal to vertical position

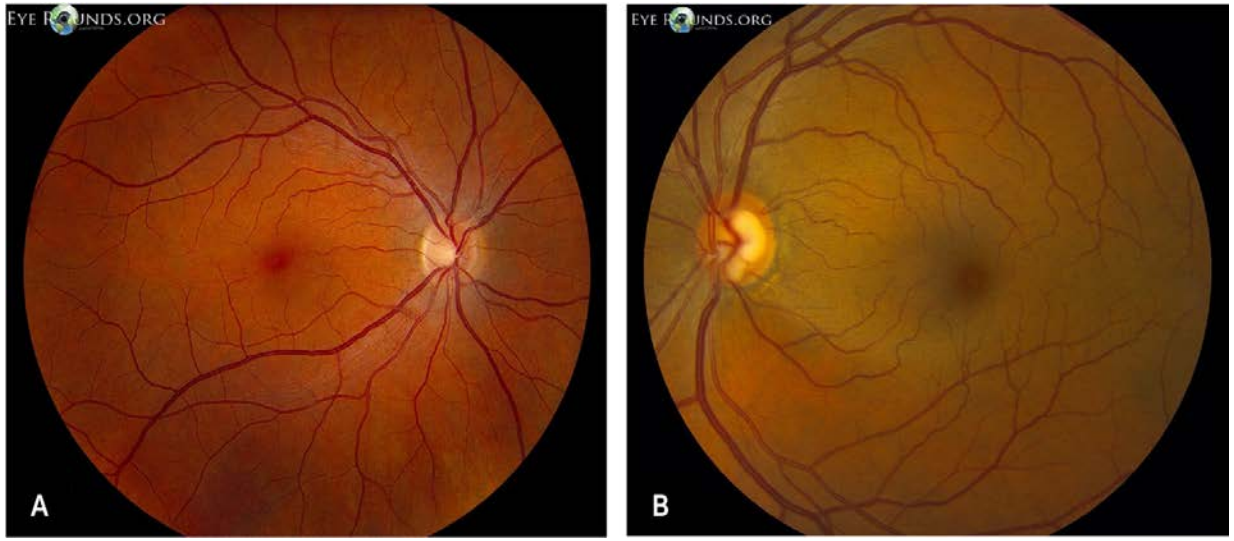


Glaucoma

- Glaucoma is progressive deterioration of the optic nerve resulting in vision loss
- Elevated IOP and an elevated cup:disc ratio increases suspicion for glaucoma. Reducing ocular pressure is the only proven treatment to stop or slow the progressive vision loss
- The balance between the rate of aqueous humor production and the rate of outflow determines intraocular pressure (IOP). Normal IOP varies with blood pressure, respiration, and time of day (lower in the evening)
- Visual field testing is not a sensitive indicator of early glaucoma because visual field defects typically do not occur until up to 50% of the retinal ganglion cells are lost. Visual field defects usually start peripherally and then migrate centrally.
- Pathogenesis is only partially understood because there are a portion of patients with elevated intraocular pressure (main risk factor for progressive open angle glaucoma) that never develop POAG
- People of African and Hispanic descent in the United States is at least threefold higher than in non-Latino White people (unclear etiology but likely multifactorial 2/2 systemic racism)
- Glaucoma is second only to cataracts as the top cause of blindness worldwide and is the leading cause of blindness among people of African descent in the United States

Risk Factors Associated w/ Glaucoma

- T2DM, SLE, RA, migraine, OSA, sickle cell disease
- Important to make sure these patients have regular eye exams and are plugged into care



Evidence for glaucoma treatment

- Topical eye drops that reduce IOP (prostaglandin analogues "-prosts", BB "- olols", carbonic anhydrase inhibitors, parasympathomimetic agents "pilocarpine")
- LIGHT trial (Selective Laser Trabeculoplasty Versus Eye Drops for First-Line Treatment of Ocular Hypertension and Glaucoma) found that 75% of patients who undergo selective laser trabeculoplasty require no additional treatment over three years
  - Laser applied to trabecular meshwork reduces resistance to aqueous flow
- Studies show that adherence to glaucoma medications is generally poor; at best, 50% of patients use topical medications consistently over four years.
- USPSTF recommendation: insufficient evidence to screen the general population for glaucoma because there are no demonstrated benefits of screening on vision-related quality of life or function

Acute Closure Glaucoma

- Clinically: acute onset blurred vision, headache, nausea, unilateral eye pain
- Aqueous outflow becomes acutely blocked by the iris leading to acute increased ocular pressure
- Optical emergency
- Acute vs chronic causes: acute onset medication-induced iris dilation or chronic presentation due to deposition of infiltrates or neovascularization of the anterior chamber
- Typically in chronic cases pts are asymptomatic or have transient symptoms that self-resolve, 30% of this population will experience an episode of acute closure glaucoma in their lives
- Meds for acute closure glaucoma for pts without access to immediate ophthalmology: IV acetazolamide, topical timolol (both block production of aqueous humor)

PRECIPITATING MEDICATIONS

- Oxybutynin
- Scopolamine
- Bupropion
- Escitalopram
- Fluoxetine
- Venlafaxine
- Diphenhydramine
- Olanzapine
- TM/SX
- Diphenhydramine
- Benztropimne

Questions for the group

- What are common eye concerns you see in your clinic?
- What resources do you have or not have in your community to care for eye-related complaints?
- What eye-related disease do you feel least equipped to counsel patients about?

Sources

1. AAFP Article on conjunctivitis: https://www.aafp.org/pubs/afp/issues/2024/0800/conjunctivitis.html

2. EBB (PhD/RN produced website) article on erythromycin ointment: https://evidencebasedbirthacademy.com/pdf-library/

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Thank You