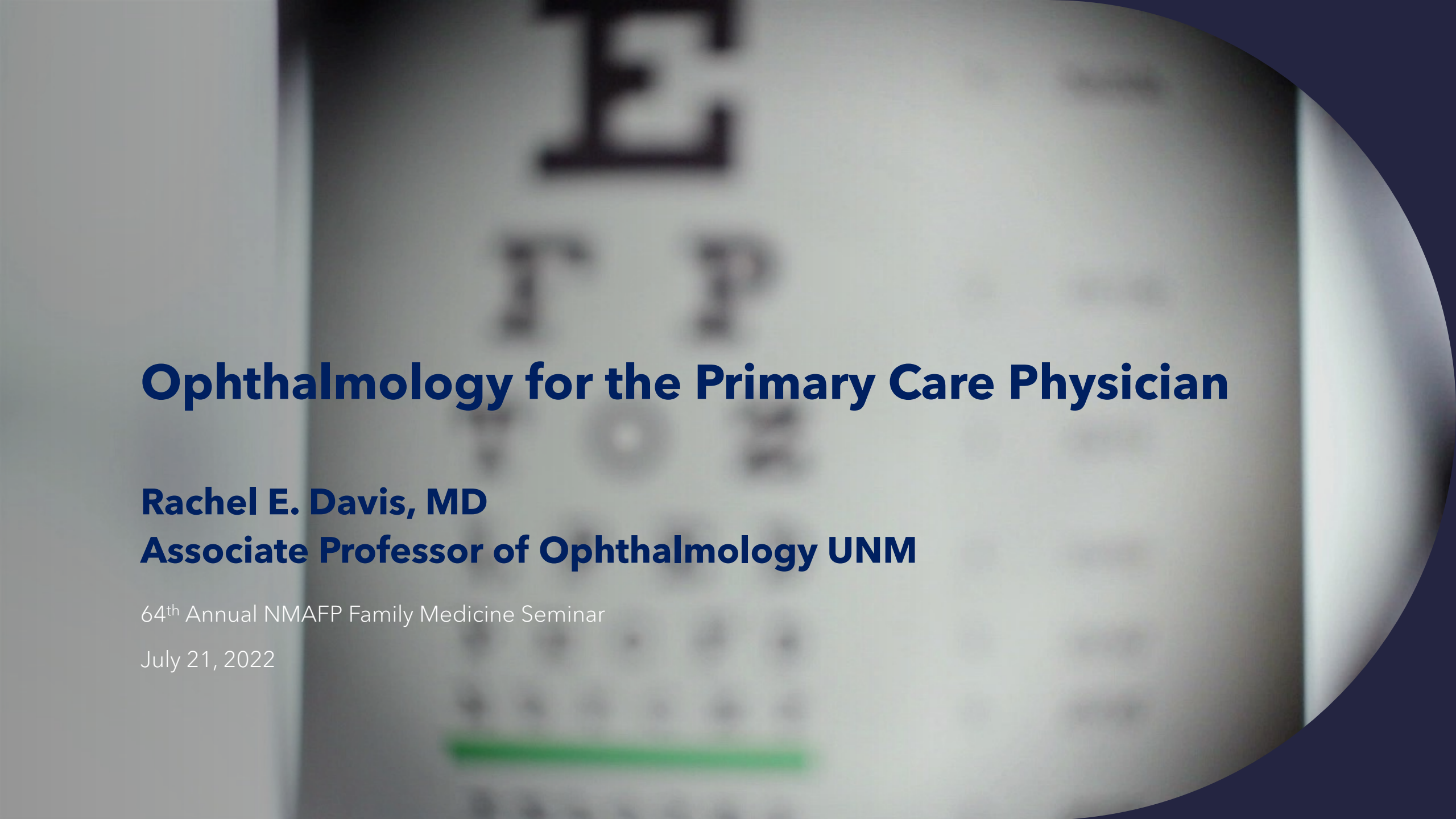




Ophthalmology for the Primary Care Physician

Rachel E. Davis, MD

Associate Professor of Ophthalmology UNM

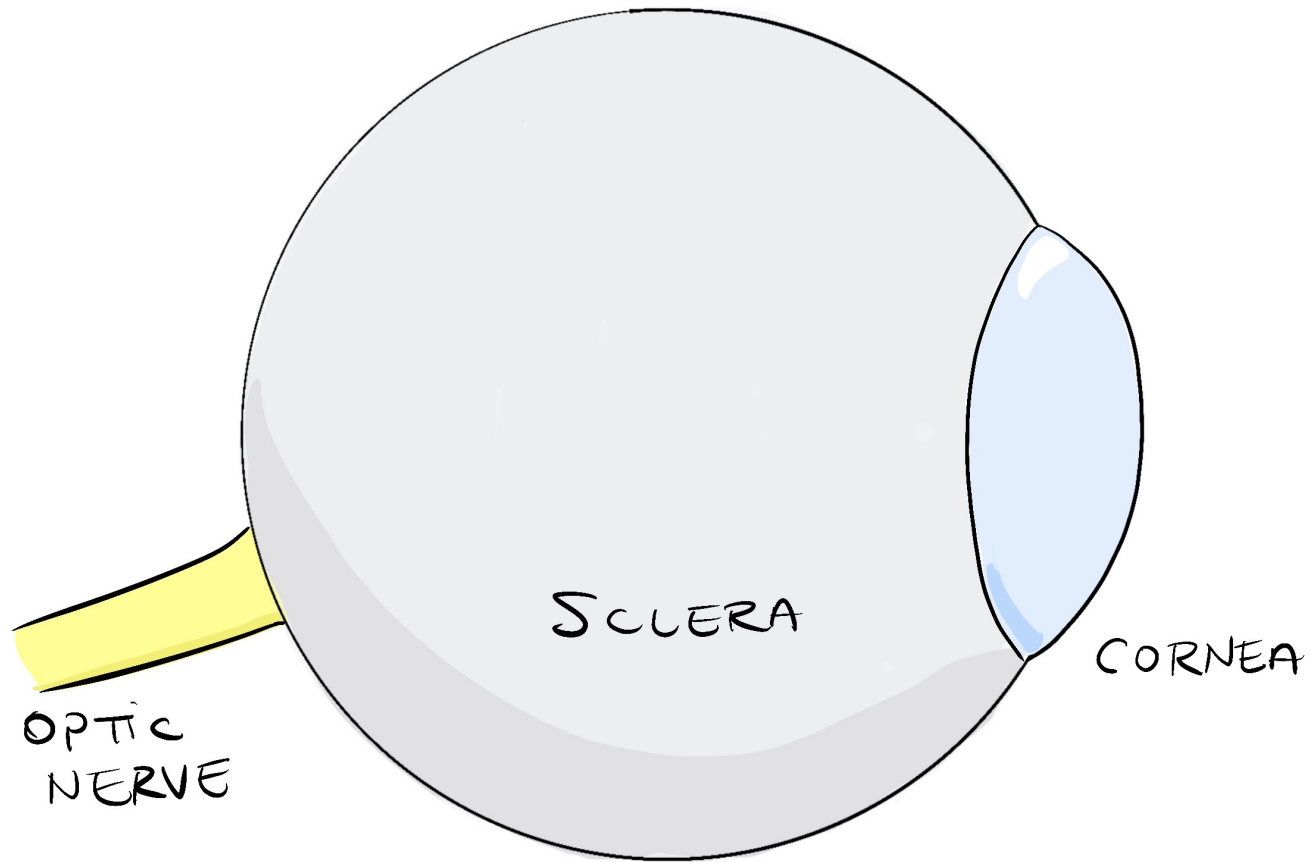
64th Annual NMAFP Family Medicine Seminar

July 21, 2022

Agenda:

- Basic eye anatomy
- Vital signs of the eye
- Common presentations:
 - ✓ Red eyes
 - ✓ Eyes with pain
 - ✓ Eyes with changes in vision (chronic and acute)
- Uncommon but sight or life-threatening diagnoses that you don't want to miss
- Fun treatment updates to know about.

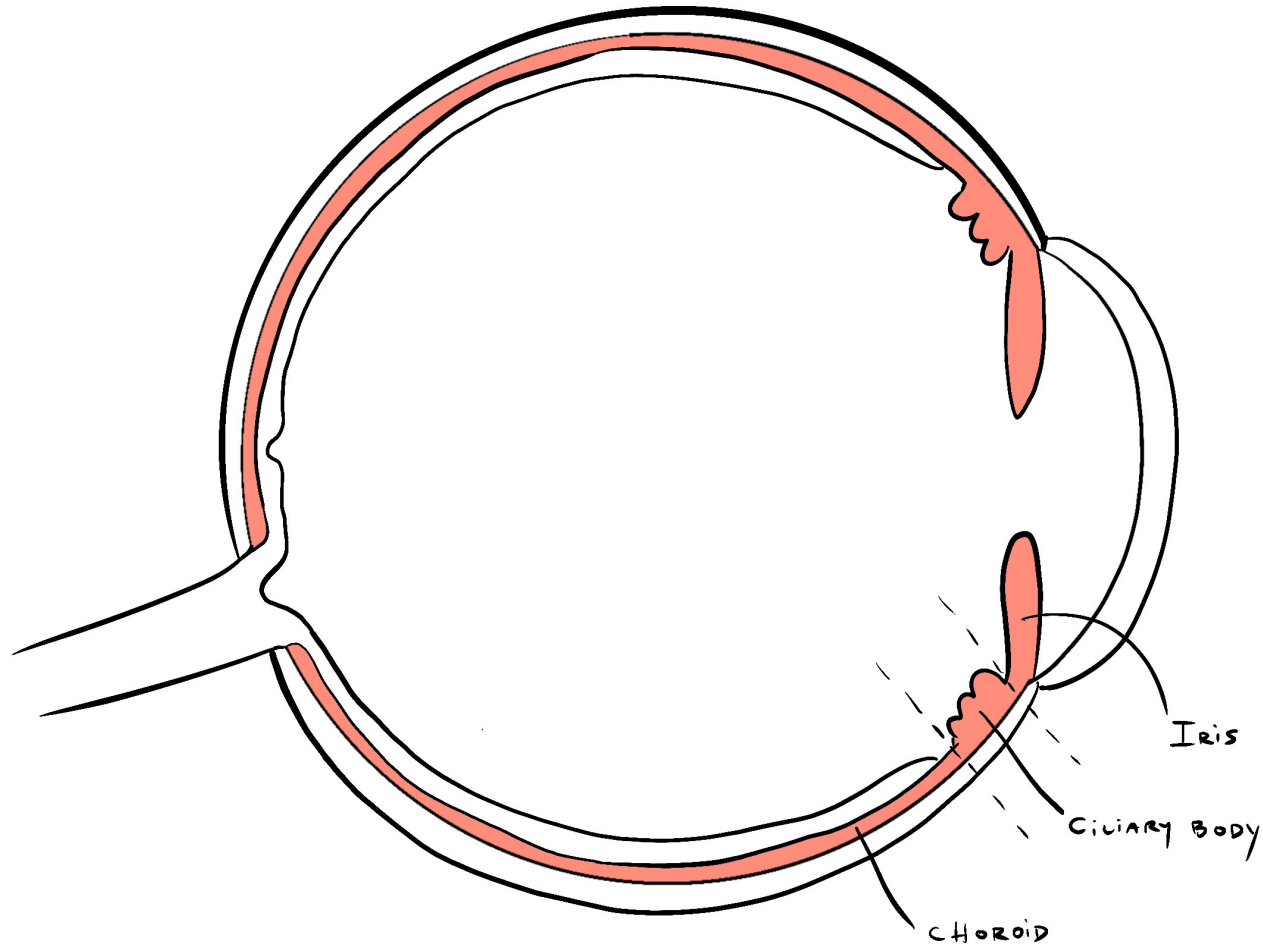
If you thought what we did was micro before, well wait until you see what we have now!



The cornea and sclera

*The Outermost Structure of
the Eye, aka the TOUGH stuff*

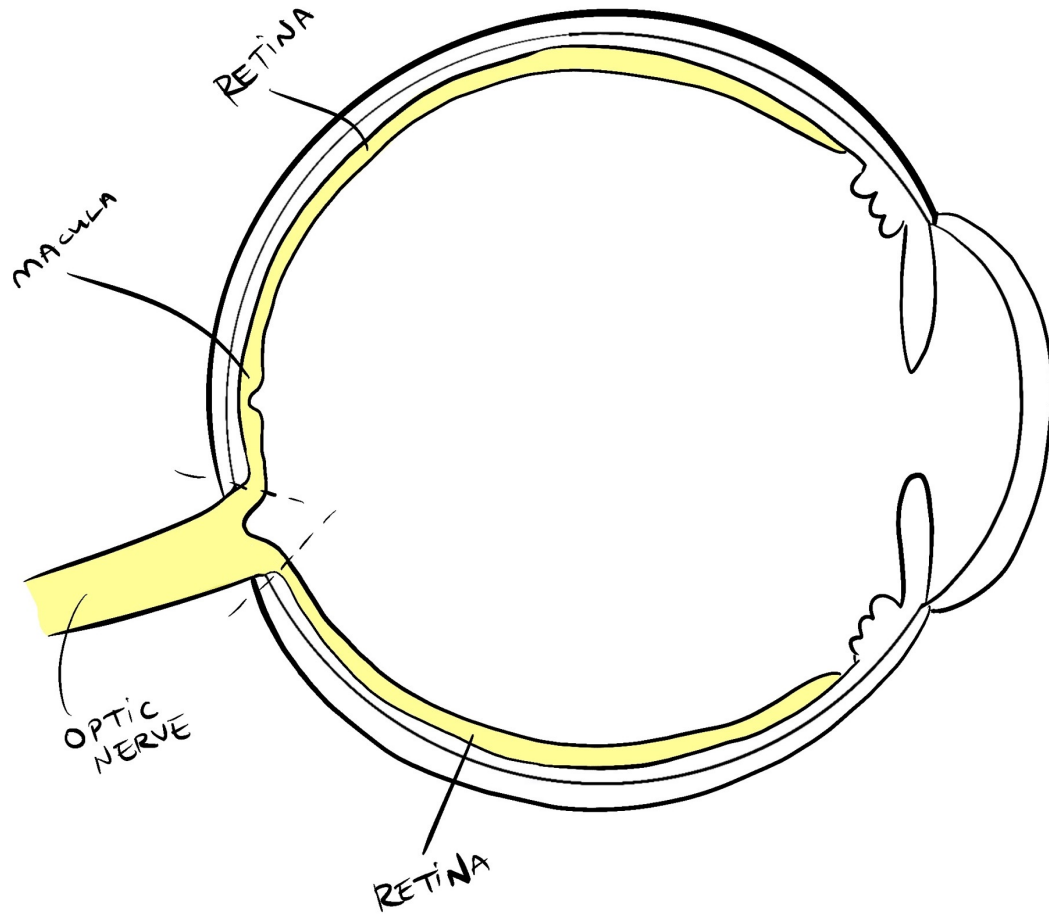
UVEAL TRACT



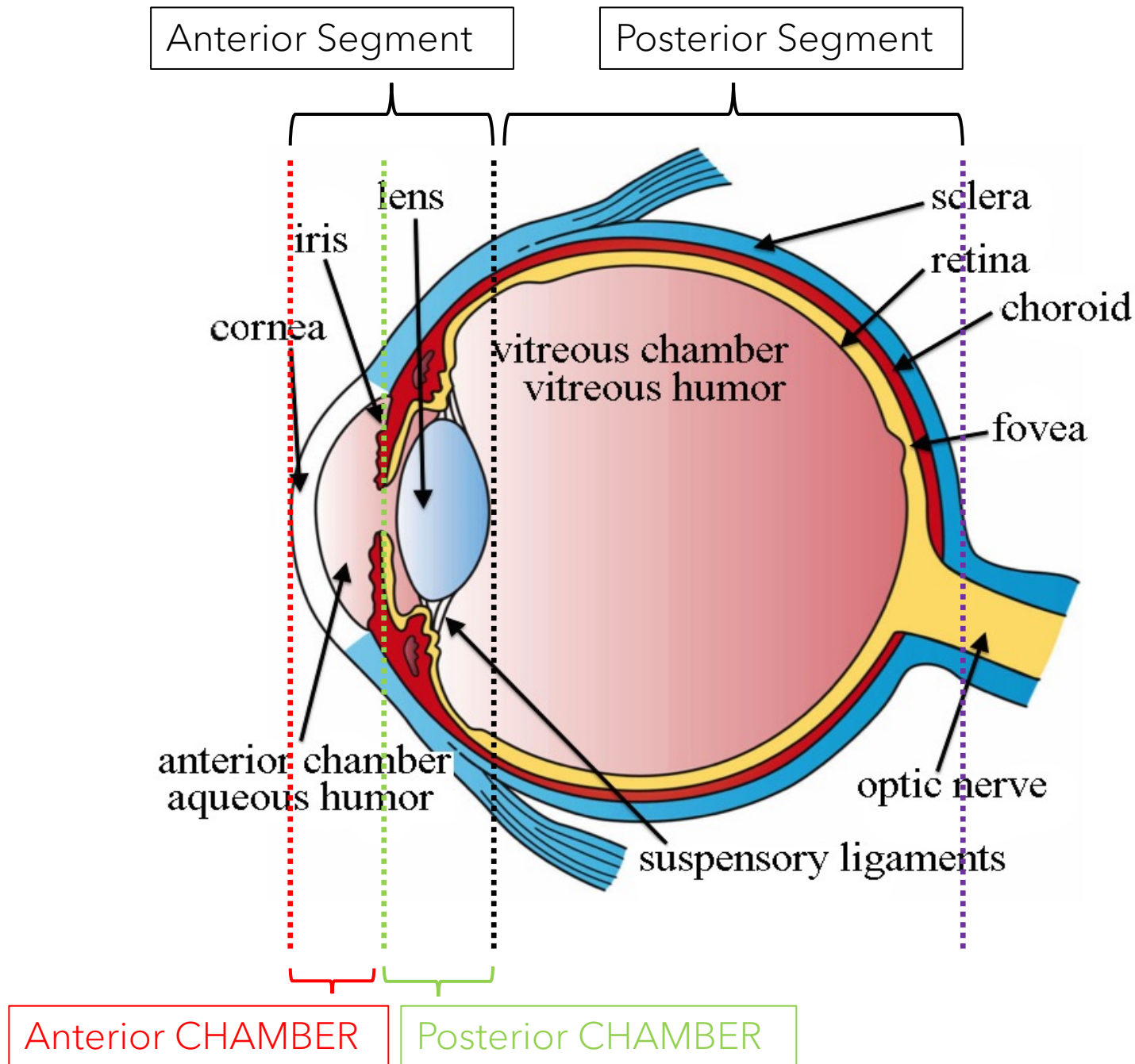
The uvea tract

*The Middle layer that
supplies the blood!*

retina (and optic nerve)



How we see!



The Chambers:

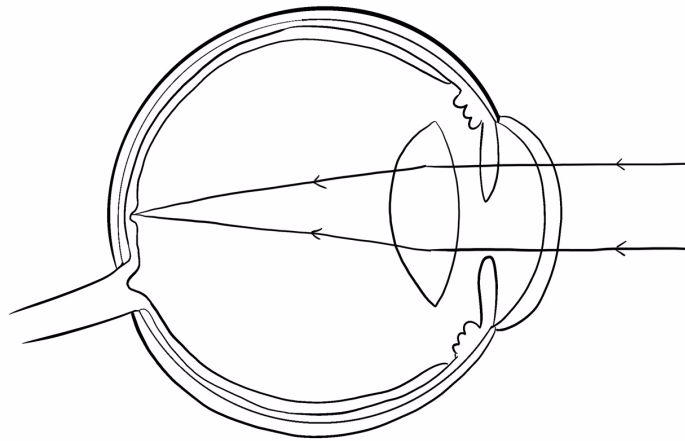
Front and Back of the anterior SEGMENT

- Anterior chamber is anterior to the iris (posterior to cornea)
- Posterior chamber is posterior to the iris (anterior to lens and zonules)

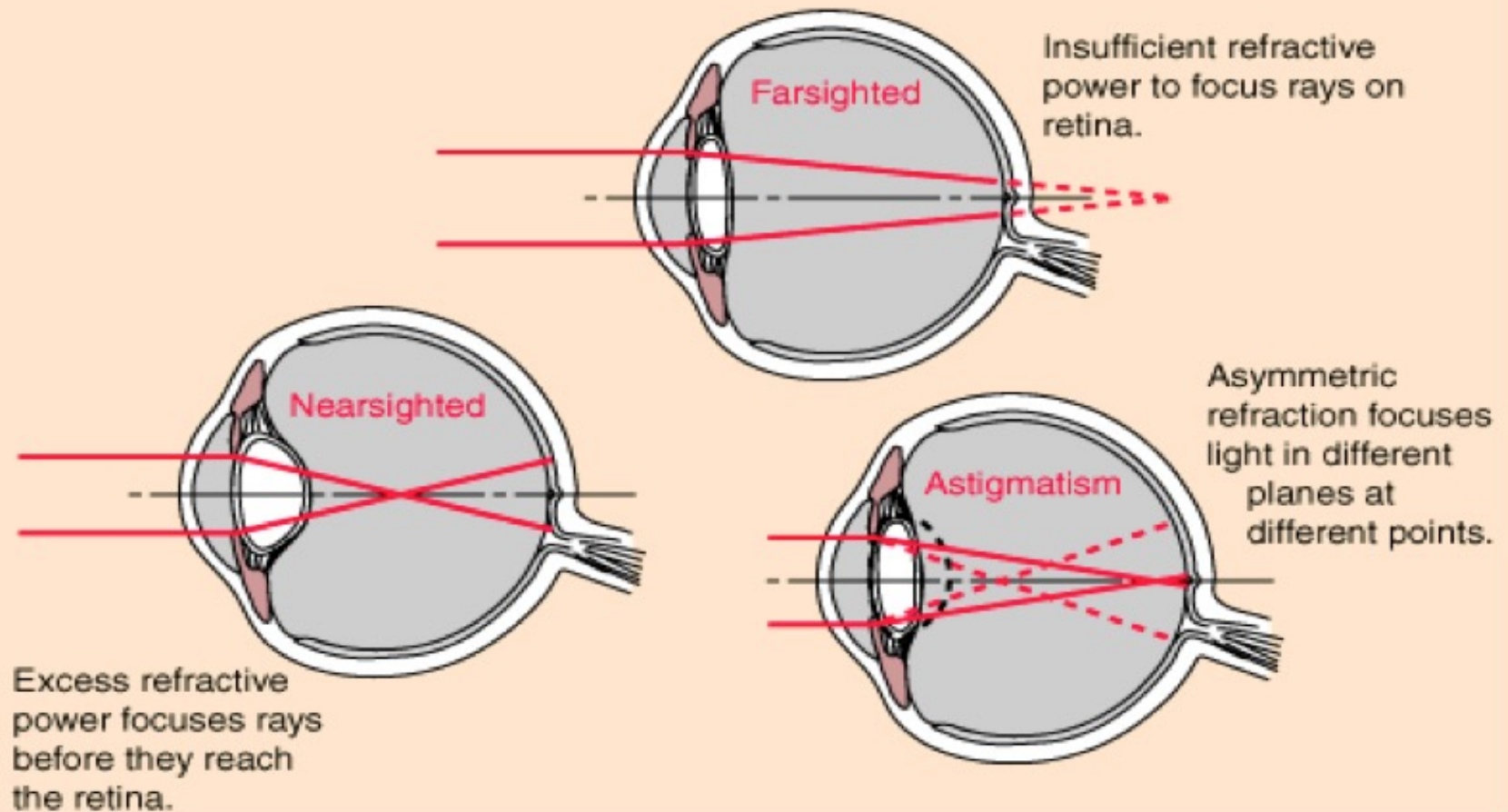
The Segments:

Divide the eye into front and back (both surgically and compartmentally)

- **Anterior segment** is from the cornea to the lens-zonules (anterior to vitreous)
- **Posterior segment** is from the back of the lens/zonules to the posterior sclera



Common Vision Defects



Measure & Record Visual Acuity

- 18 yo healthy man
- C/C: failed eye test at DMV
- Near card "20/20"
- DMV test 20/50

E G N U

14 inches

E G N U

20 feet

Measure & Record Visual Acuity

- 20/50 means that the eye can read at 20 ft what a normal eye can read at 50 ft



Measure & Record Visual Acuity

- 20/50 means that the eye can read at 20 ft what a normal eye can read at 50 ft
- 20/50 means that the eye can read the 20/50 line on the eye chart 20 ft away

The Vital Signs of the Eye

Vision, Pressure, Pupils

- Visual acuity (best corrected) of each eye
- Intraocular pressure (IOP)
- Pupils – are they reactive, are they equal, is there an afferent pupillary defect?

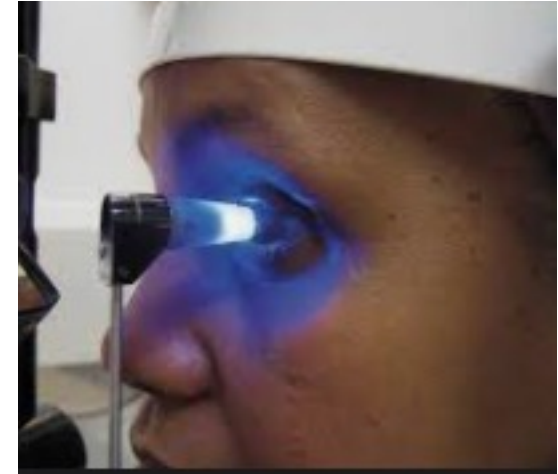
Also helpful and important: Eye movement and Confrontation visual fields

Why is this important ?

Because the red flags for many serious eye problems are severe pain, elevated IOP, big decrease in acuity and anisocoria

How to determine intraocular pressure or IOP

Recall that normal IOP is 6-21mmHg

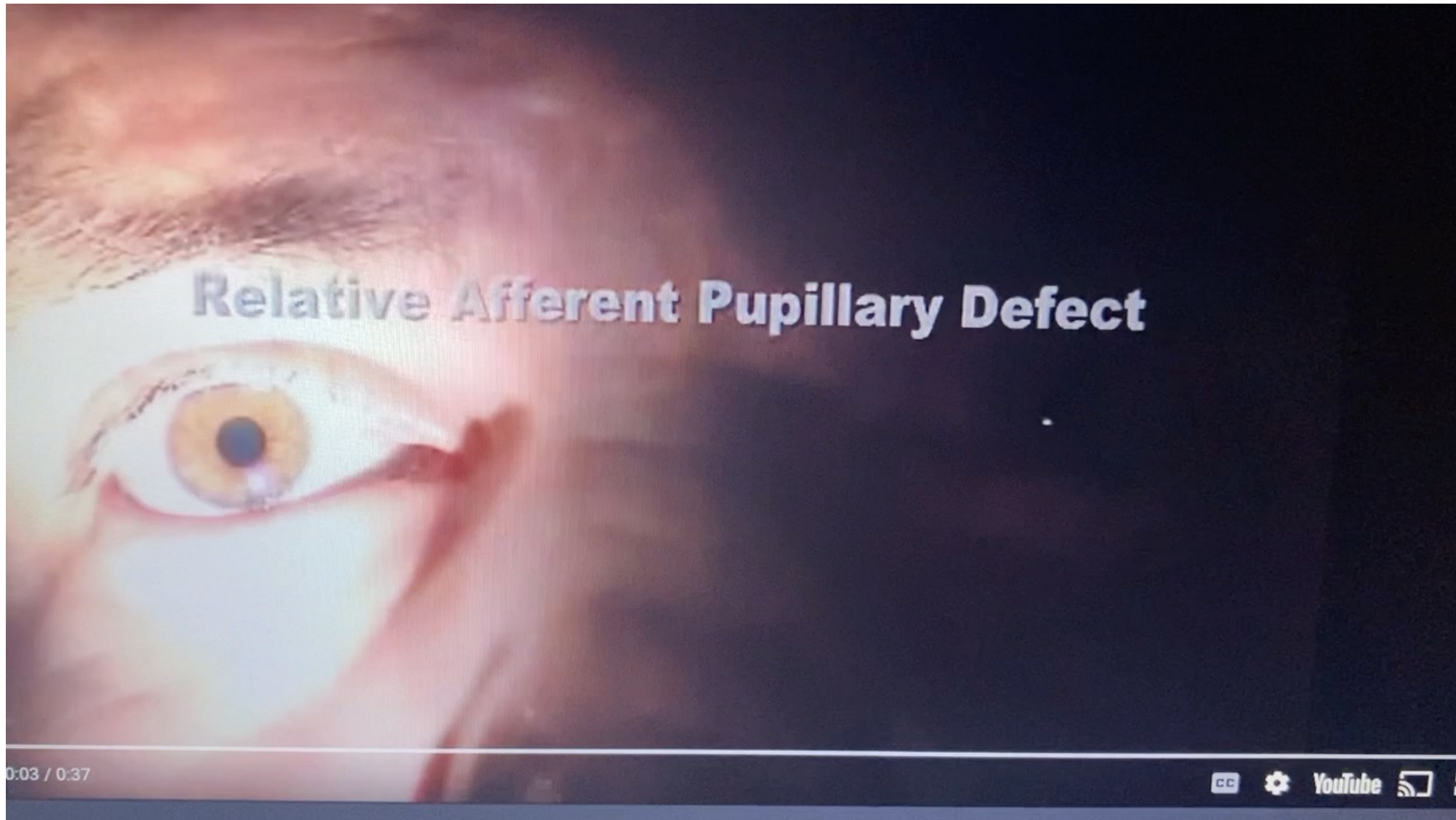


Check Pupils

- Is each one reactive? Does it move?
- What is the size? Are they about the same or different?
- Is there an Afferent pupillary defect?

An APD or RAPD indicates damage to the optic nerve or severe retinal ischemia. APDs are seen in Optic neuropathies, Central Retinal Vein Occlusions and Central Retinal Artery Occlusions and in severe asymmetric glaucoma.

Afferent Pupillary Defect – Video credit U.Michigan Kellogg Eye Center



Important Pupil concepts:

- Efferent pupillary defects cause anisocoria or unequal pupil sizes. There will be no constriction of the pupil either directly or consensually if there is an efferent problem.

Causes of Efferent pupil defects:

Pharmacologic: Scopolamine or other dilating agents, Sympathomimetics

Trauma: direct damage to the sphincter muscle

3rd Nerve palsy: damage to CN3

Adie's tonic pupil (look at old pictures to determine if this is old)

Acute pupillary block

- Afferent pupillary defects will **not** cause anisocoria. The pupils will be equal in size. You will only see the APD when you perform the swinging flashlight test because it is relative to the other eye.

Eye exam pearls

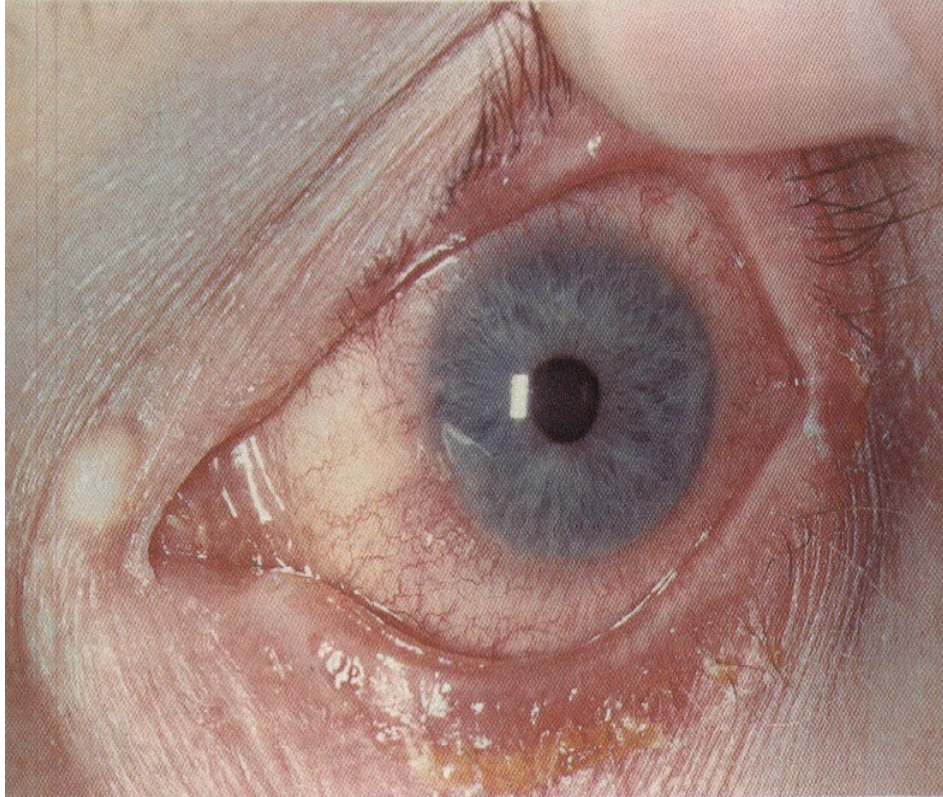
- Check visual acuity one eye at a time with best correction (try near vision and distance)
- An Afferent Pupillary Defect (APD) suggests Optic Nerve dysfunction
- Know how to check pressure
- Use as little fluorescein as possible
- Use anesthetic (tetracaine or proparacaine) to exam painful eyes

Evaluate a red eye

- 28 yo man
- Both eyes red for 3 days
- Eyes itch
- PMH: hayfever
- Va: 20/25 OU



Evaluate a red eye



- 32 yo woman
- Both eyes red x 3 days
- Started in left eye 5 days ago
- Eyes feel gritty, sandy
- Vision unchanged
- 5 yo son has same

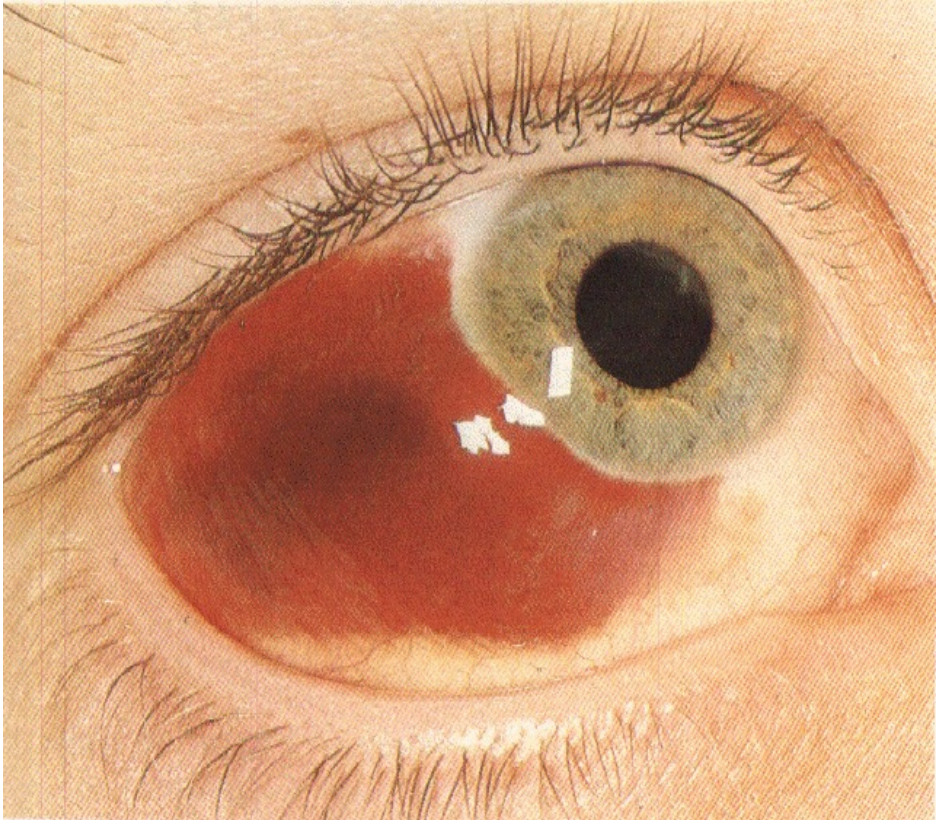
Bacterial Conjunctivitis

(rare but one not to miss Chlamydial Gonococcal)



- Tender enlarged lymph preauricular nodes and purulent discharge
- 18-25 age range
- STD history

Evaluate a red eye



- 60 yo man
- Left eye bright red since this morning
- No pain
- No change in vision

Treatment: reassurance that this is benign and will go away in 2-3 wk.

Also a subconjunctival hemorrhage



SCH in a 75 year old man on coumadin reporting no trauma and sudden onset redness after a cough.

Treatment with lubricating ointment and artificial tears

OR

Could also be ruptured globe in a 20 year old struck with a fly ball direct hit to the eye.

Needs urgent referral to ED for orbital CT and ophthalmology consult

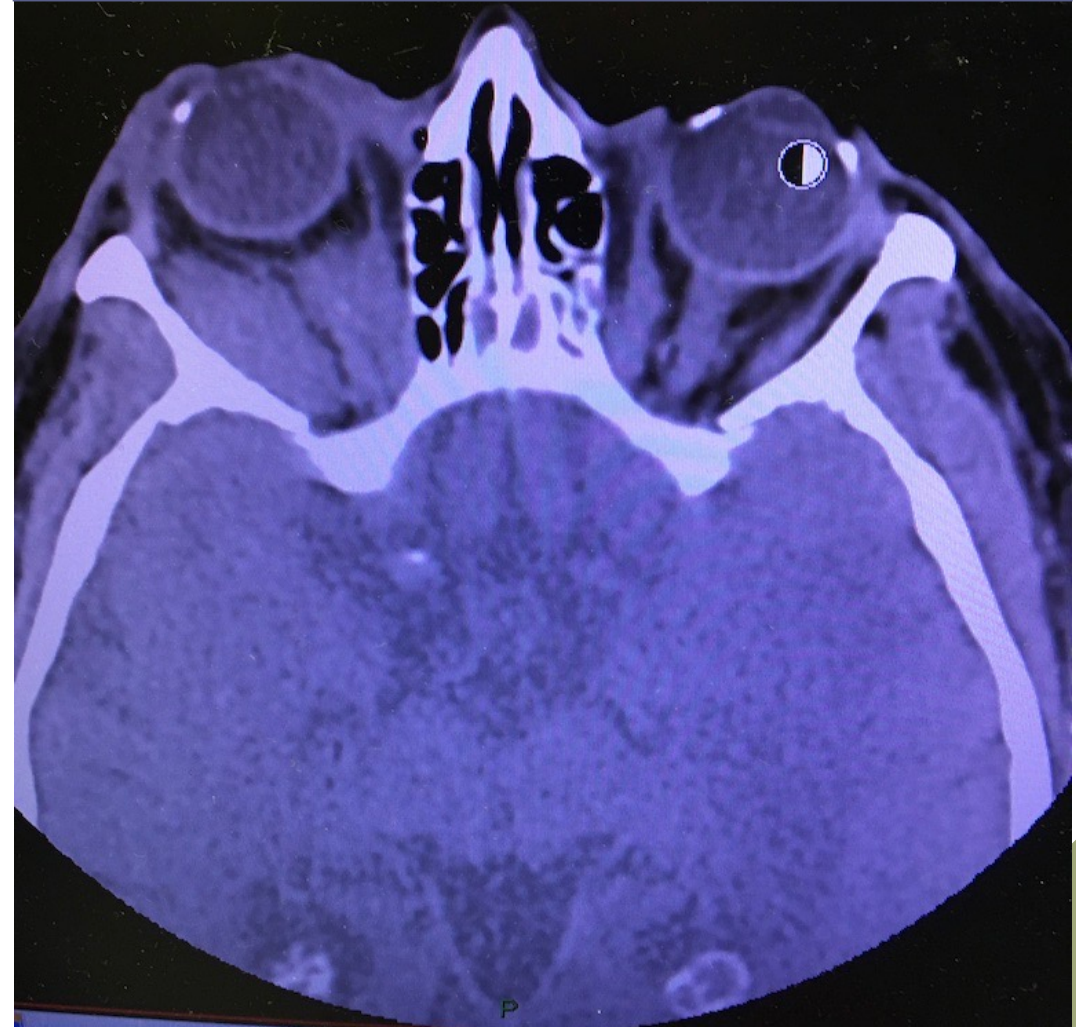
Also a subconjunctival hemorrhage (more sinister)

85 year old woman sent from a nursing facility for a chronic red eye for several weeks. The patient has dementia and has been acting normal as per care givers.

On exam the patient cannot cooperate in a vision test but you notice the **eye feels firm**, not soft and she **is unable to move it** up and down or side to side (the left moves normal). There is notable **proptosis** to the right eye. There is an **APD** on the right.



Ocular Lymphoma



Don't forget to ask about eye drop use!

- 65 year old man presents in December with increasing irritation to both eyes, redness in the eyes and around the skin and itching.
- No history of seasonal allergies or new medication use.
- Has glaucoma and has used Lumigan and brimonidine eye drops for the past 10 years.

Brimonidine allergy occurs in 30% of patients that use it. It can happen immediately or after years of use.

Other names for brimonidine are Alphagan, Combigan, and Simbrinza.

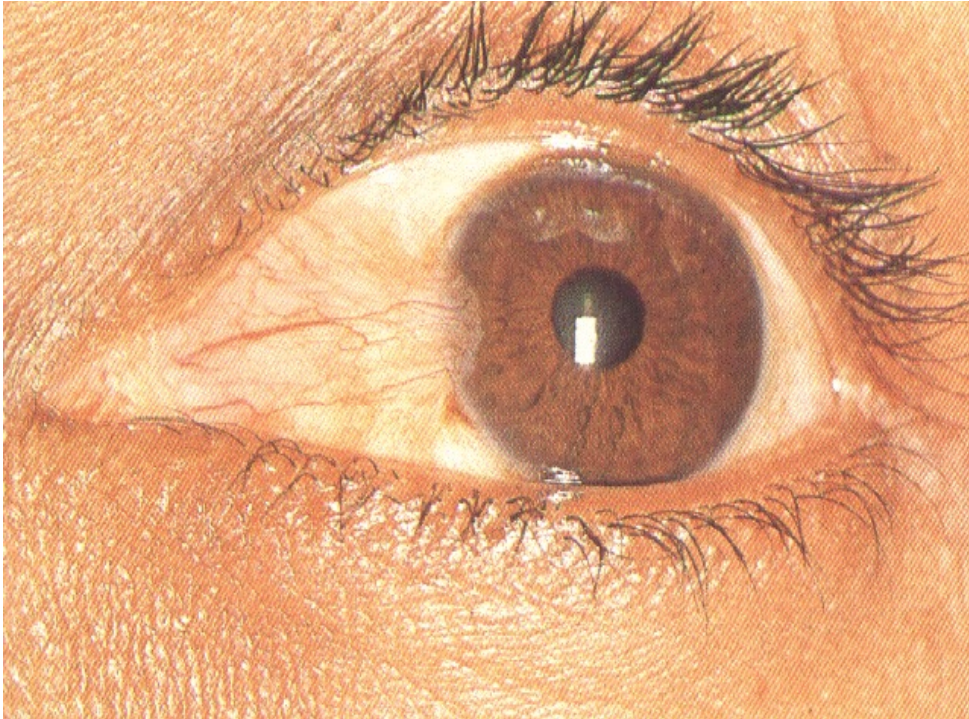


Stye/Chalazion

- Inflammation of lash follicle or oil gland
- Painful bump on eyelid
- Treatment
 - Warm compresses x 6 weeks
 - May need excision/drainage



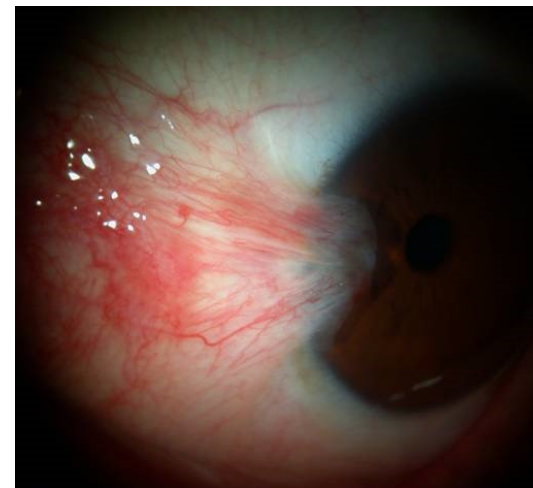
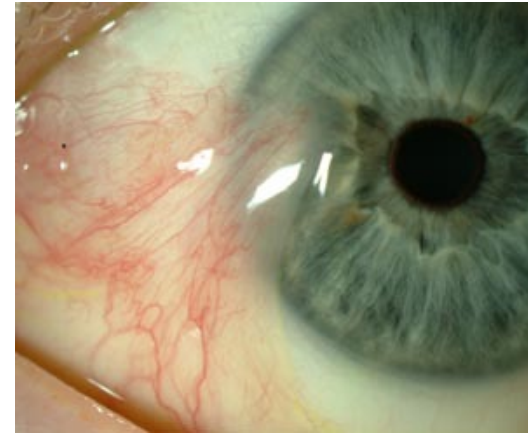
Evaluate a red eye



- 36 yo woman
- Sandy/gritty feeling both eyes for months
- Red thing in eye
- Vision normal

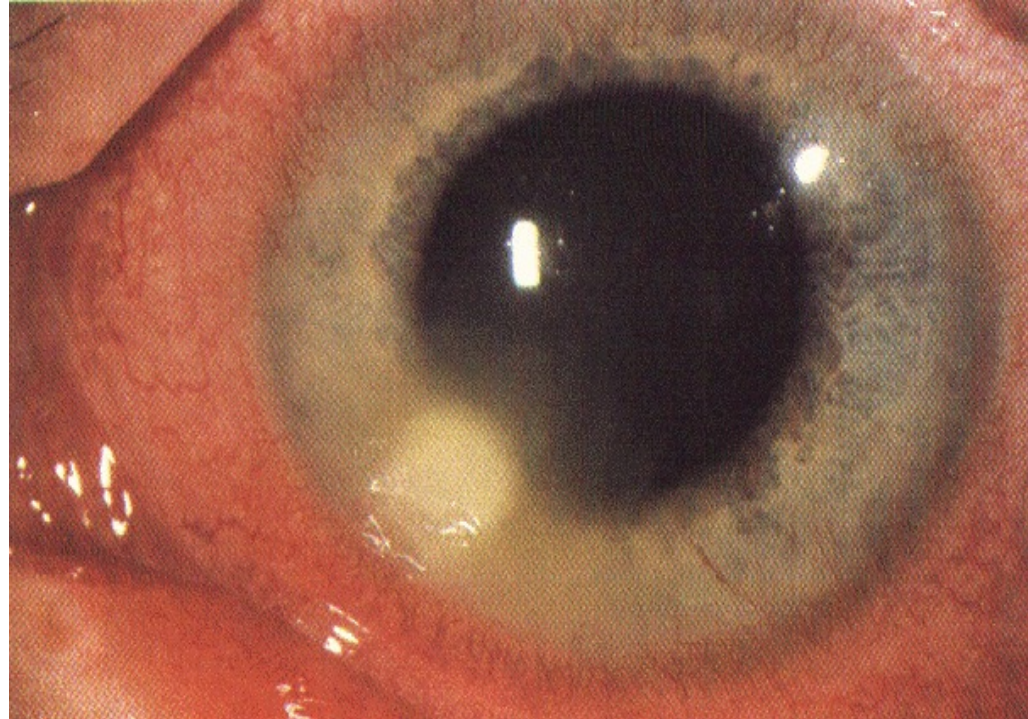
Pterygium

- Fibrovascular proliferation of palpebral conjunctiva
Usually nasal
Slow-growing
- Extends onto cornea
- Vascularity creates chronic redness
- Treatment – usually none
- Only cure is surgical excision

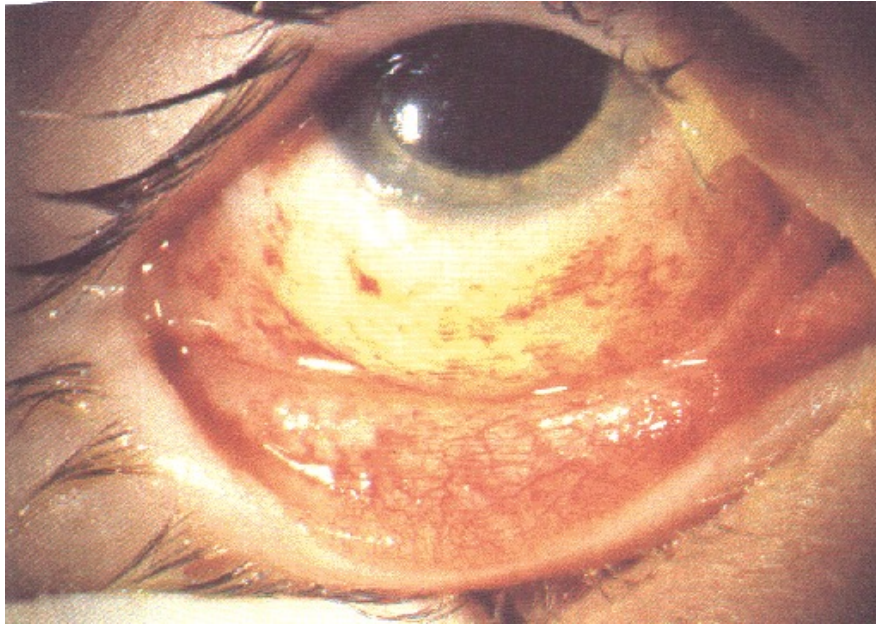


Evaluate a red eye

- 25 yo resident
- Right eye red, painful/stinging since woke up post call
- Extended wear contact user, fell asleep with lenses in
- Vision a little blurry



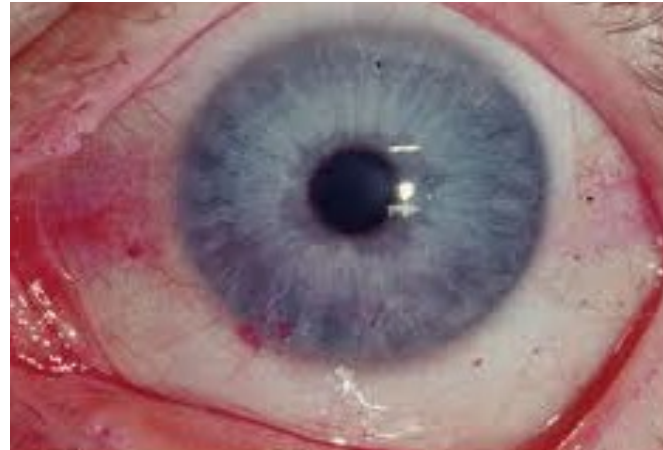
Evaluate a red eye



- 55 yo custodian
- Eyes red, burning since splashed with cleaning solution
- Vision decreased

Dry Eye Syndrome

- Symptoms
 - Wind, smoke, staring at screen exacerbates
 - Waxing/waning vision
 - Blinking or resting eyes helps
 - Tearing
- Etiology
 - Inadequate tear production
 - Sjogren's Syndrome
 - Tear film instability
 - Eyelid disorders
- Treatment
 - Lubricant eye drops (artificial tears)
 - Warm compresses
 - Flaxseed or fish oil

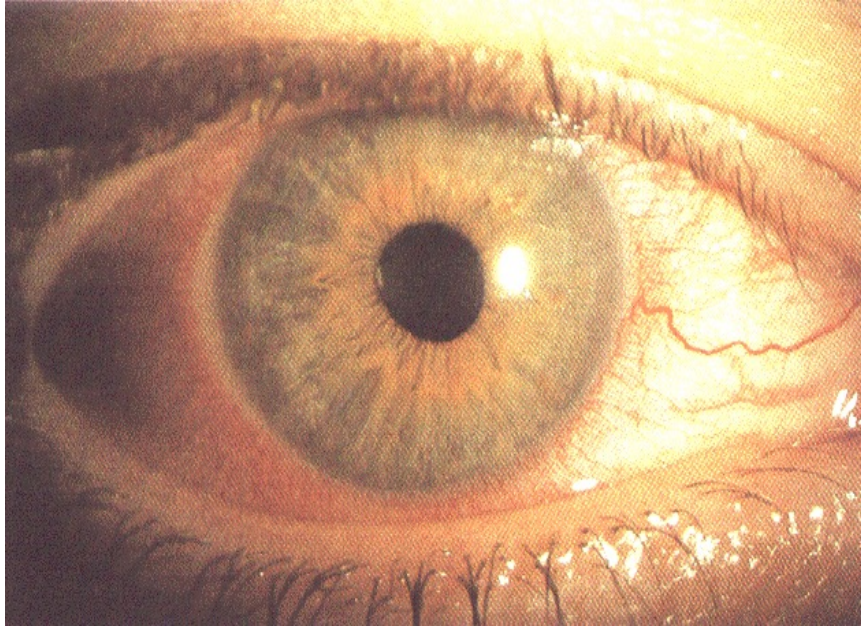


Evaluate a red eye



- 65 yo man
- Red right eye, facial swelling worsening over past few days
- h/o shingles

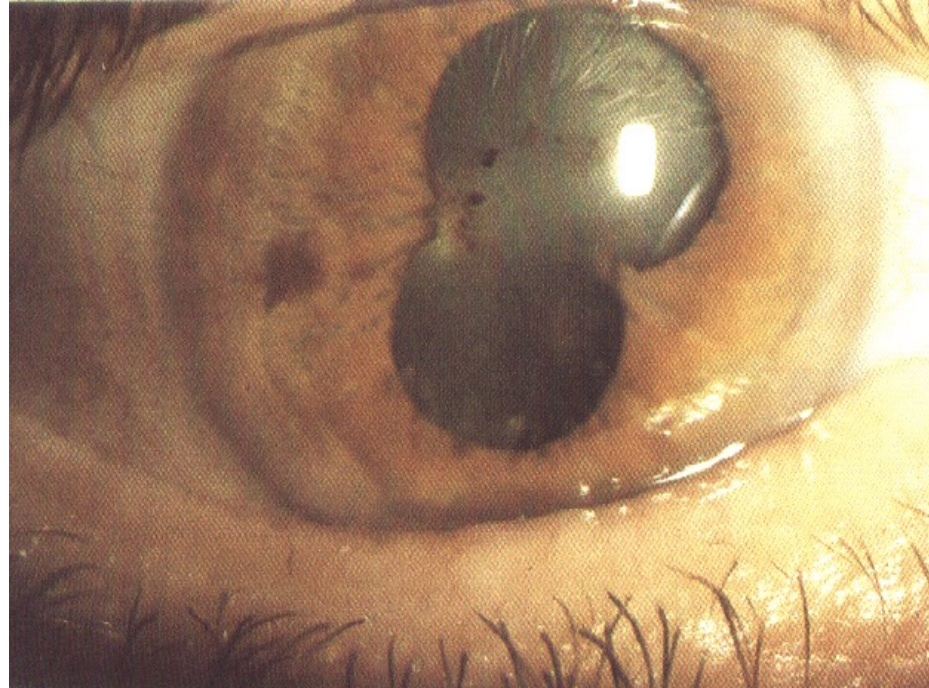
Evaluate a red eye



- 28 yo man
- Left eye red, light sensitive x 2 days
- Vision normal
- h/o back trouble

Evaluate a red eye

- 45 yo AA woman
- Both eyes red, light sensitive for past week
- Vision decreased
- Internist working up her SOB



Endophthalmitis

- Infection inside eyeball
- Red, painful eye
- Hypopyon
- Sources
 - Surgery
 - Trauma
 - Endogenous



Severe Eye Infections Increasing as Opioid Crisis Continues

Leer en Español: [Las infecciones oculares graves aumentan a medida que continúa la crisis de opioides](#)



By [Reena Mukamal](#)

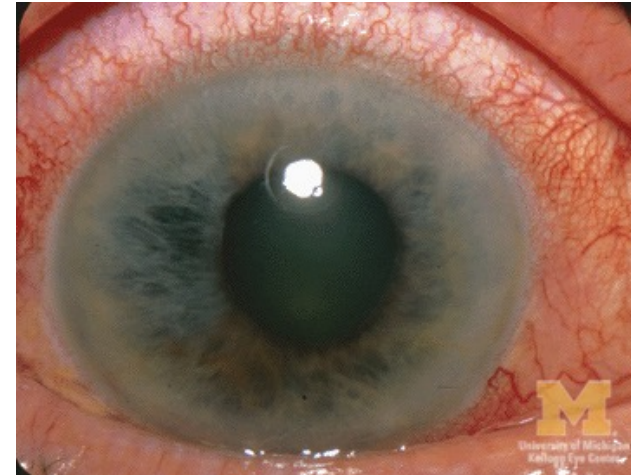
Reviewed By [Natasha L Herz MD](#)

Feb. 04, 2021



Acute glaucoma

- Sudden increase in intraocular pressure (IOP)
- Red, pain, blurred vision, mid-dilated pupil fixed (efferent defect and afferent defect)
- Nausea
- Emergency – hours count
- This is why you need to know how to check IOP
- Immediate treatment and referral



Trauma

- Corneal abrasions and ruptured globes



Toy Guns, Crossbows and Nerf Darts Can Shoot Your Eyes Out

Leer en Español: [Es un hecho, las pistolas de juguete son peligrosas para los ojos](#)



By [Dan T. Gudgel](#)

Nov. 12, 2020

Red Eye Recap

With relatively normal vision

- Conjunctivitis (allergic, viral, rare bacterial)
- Subconjunctival hemorrhage
- Drug reaction
- Pterygium
- Iritis or scleritis
- Dry eye
- Chalazion

With more profound vision change

- Angle Closure Glaucoma
- Neovascular Glaucoma
- Corneal ulcer
- Severe chemical injury
- Severe iritis or endophthalmitis
- Orbital tumors
- Orbital cellulitis
- Trauma: corneal abrasion, chemical injury, foreign body, ruptured globe, retrobulbar hematoma

Chronic visual loss without pain or redness

- Cataract - opacification of the natural lens
- Diabetes in the eye is a retinal vascular disease
Non-proliferative and proliferative stages
- Macular Degeneration affects the central retina
Dry and wet stages - we treat wet macular degeneration with intraocular injections of Anti-VEGF drugs
- Glaucoma is damage to the Optic Nerve
Progressive, Painless, Permanent, Preventable and painful acute angle closure forms are rare

Bell's Palsy and facial strokes

- Important to note if the patient can close their eyes
- Observe them – if while they are talking, they are not closing, they have lagophthalmos and need heavy lubrication : ointments. Otherwise could just use artificial tears
- Have them follow up for eye visit in a few weeks

Flashes and floaters

- Ocular migraines
- Posterior vitreous detachment
- Retinal detachment
- Vitreous hemorrhage – seen in diabetics with the most severe form of retinopathy

Viagra

- Works by turning off the enzyme phosphodiesterase 5 but at high doses also meddles with a related retinal enzyme which can lead to an ischemic optic neuropathy.
- Side effects often emerge in men with underlying health conditions: HTN and heart disease or in men with an abnormal optic nerve or inherited retinal dystrophy.

Advice for Men: "More is Not Better"

Flomax (tamsulosin) α 1-adrenergic receptor antagonist

- Chang DF, Campbell JR. Intraoperative floppy iris syndrome associated with tamsulosin. J Cataract Refract Surg. 2005 Apr;31(4):664-73.

Characterized by these three features which we call IFIS:

- A flaccid iris stroma that flutters and billows in response to physiologic intraocular fluid currents
 - A tendency for the iris stroma to prolapse toward the phaco and side-port incisions despite proper wound construction, and
 - Progressive pupil constriction despite standard preoperative pharmacologic measures to prevent this.
-
- Can still have impacts, even after stopping the drug, so it does not help to stop. It only helps to not start it in the first place.

“Blame It on the Flomax” by residents at the U. of Iowa



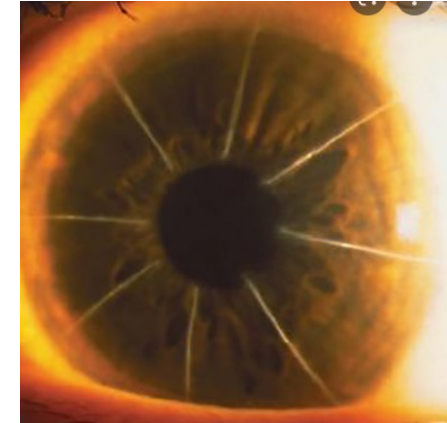
Remember the causes of sudden loss of vision or sudden double vision (Things that are rare but we don't want to miss)

- Stroke CVA
- ION (high association with OSA) or CRVO/CRAO = sudden loss of vision and presence of APD
- Third nerve palsy
- GCA
- Angle closure glaucoma
- Retinoblastoma or leukocoria in a child
- Congenital glaucoma
- Recall medicines that can cause vision loss: Viagra, hydroxychloroquine,

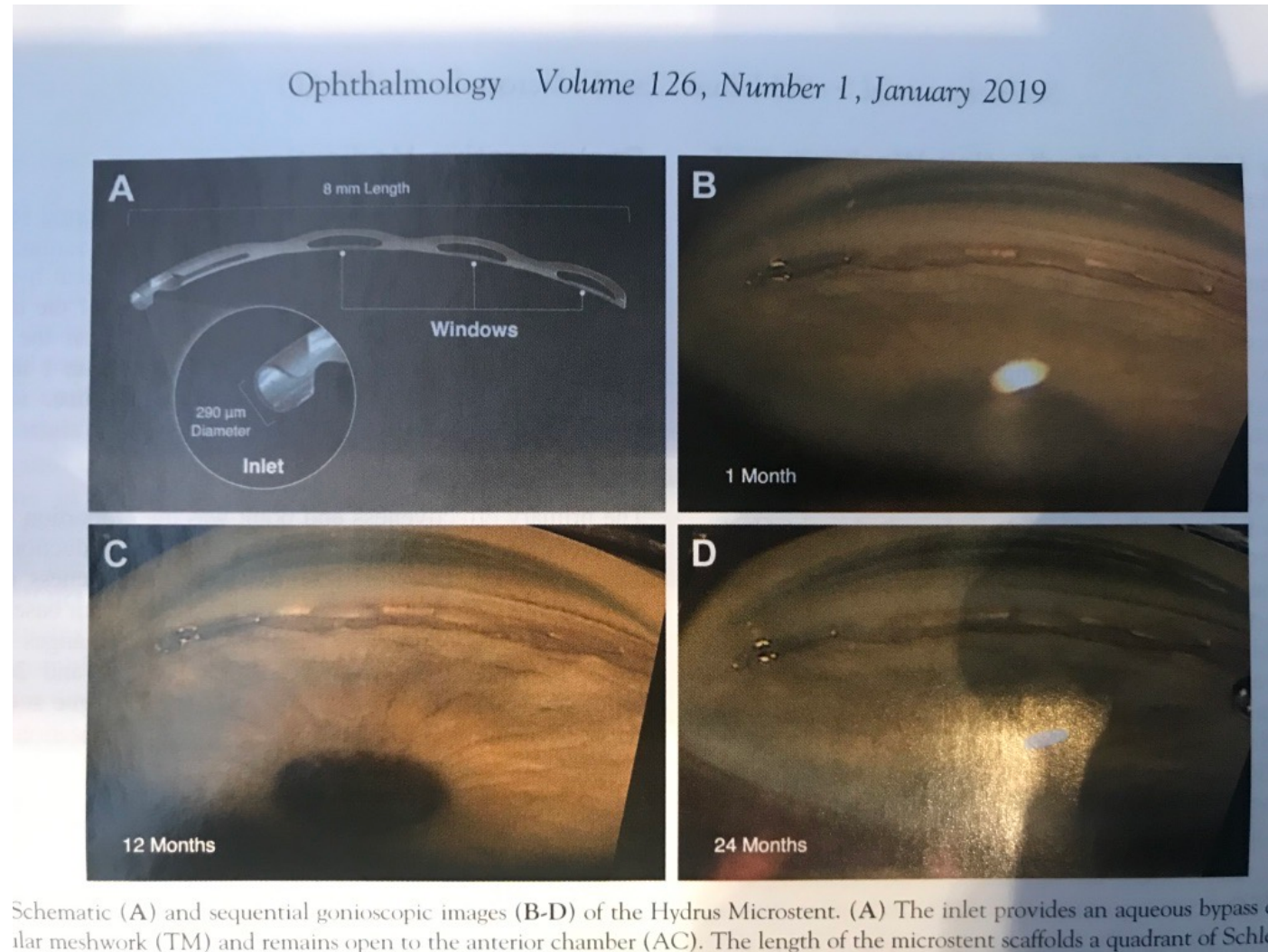
What's new in ophthalmology?

- LASIK revamping - the SMILE technique
- MIGS (Minimally Invasive Glaucoma Surgery)
- Cornea transplant of 1 layer of the cornea DMEK
- Gene therapy for inherited retinal dystrophy
- Pilocarpine eye drops for adults to treat presbyopia
- Atropine eye drops to slow the progression of Myopia in children
- Thyroid eye disease treatment without surgery
- Premium lens cataract surgery and laser assisted cataract surgery

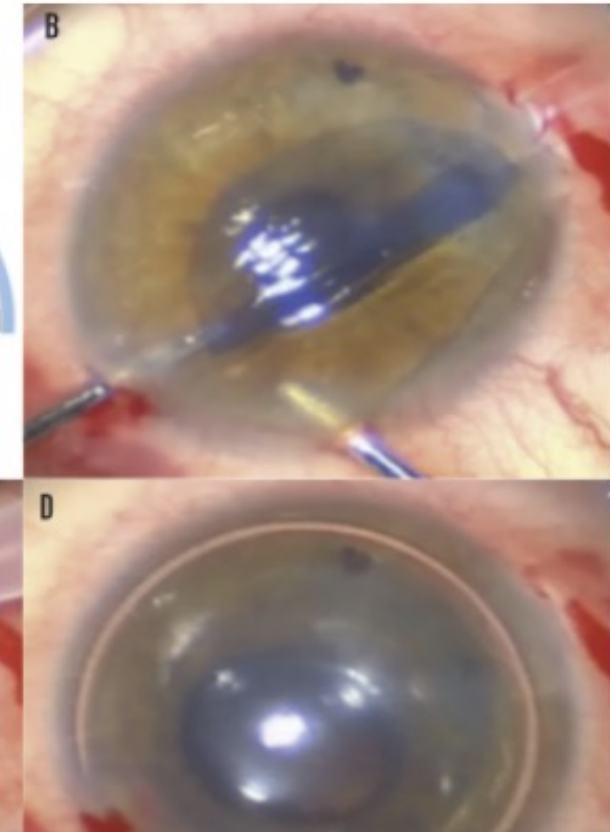
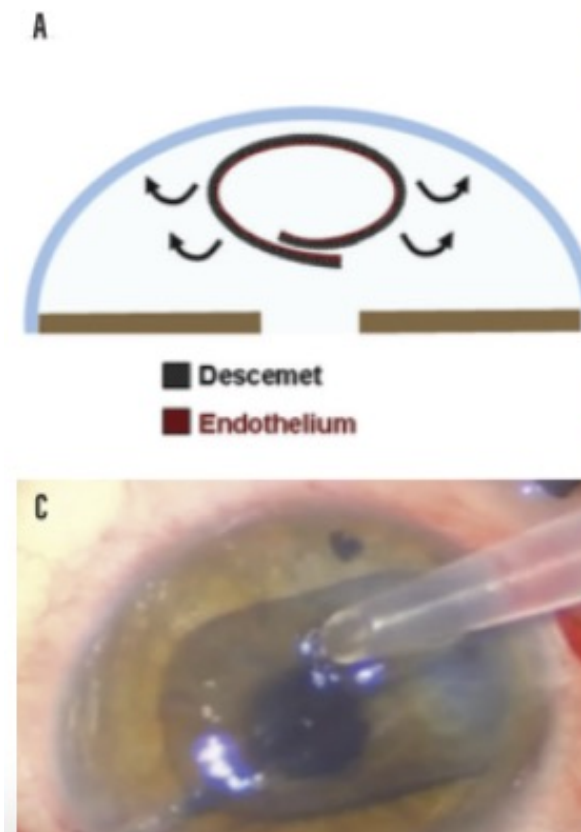
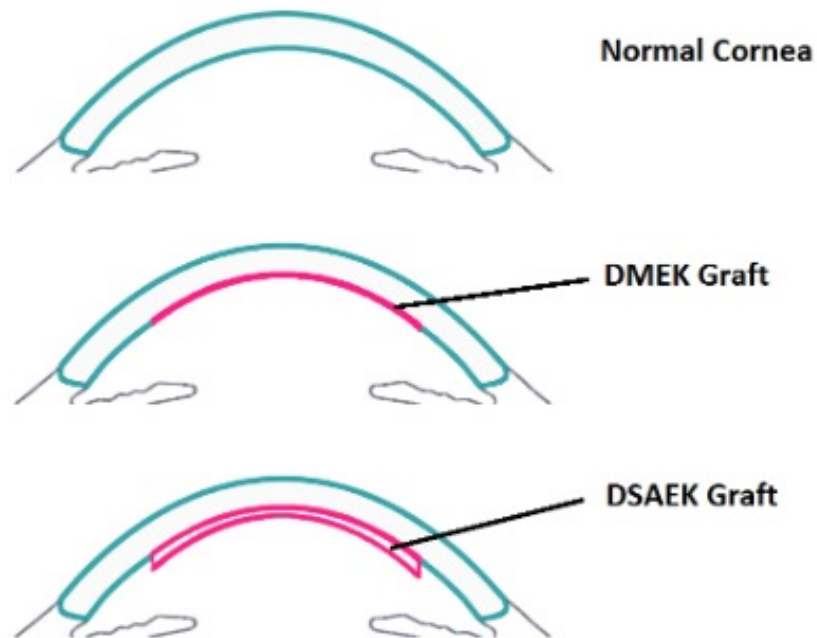
Small incision lenticule extraction or SMILE



Micro Invasive Glaucoma Surgery (MIGS)



Descemet Membrane Endothelial Keratoplasty DMEK



What's new in ophthalmology?

- LASIK revamping - the SMILE technique
- MIGS (Minimally Invasive Glaucoma Surgery)
- Cornea transplant of 1 layer of the cornea DMEK
- **Gene therapy for some inherited retinal dystrophy**
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Pilocarpine for early presbyopia in adults

Vuity is pilocarpine 1.25% daily use

Cholinergic muscarinic agonist

Constricts the iris sphincter and

Contracts the ciliary muscle

Side effects:

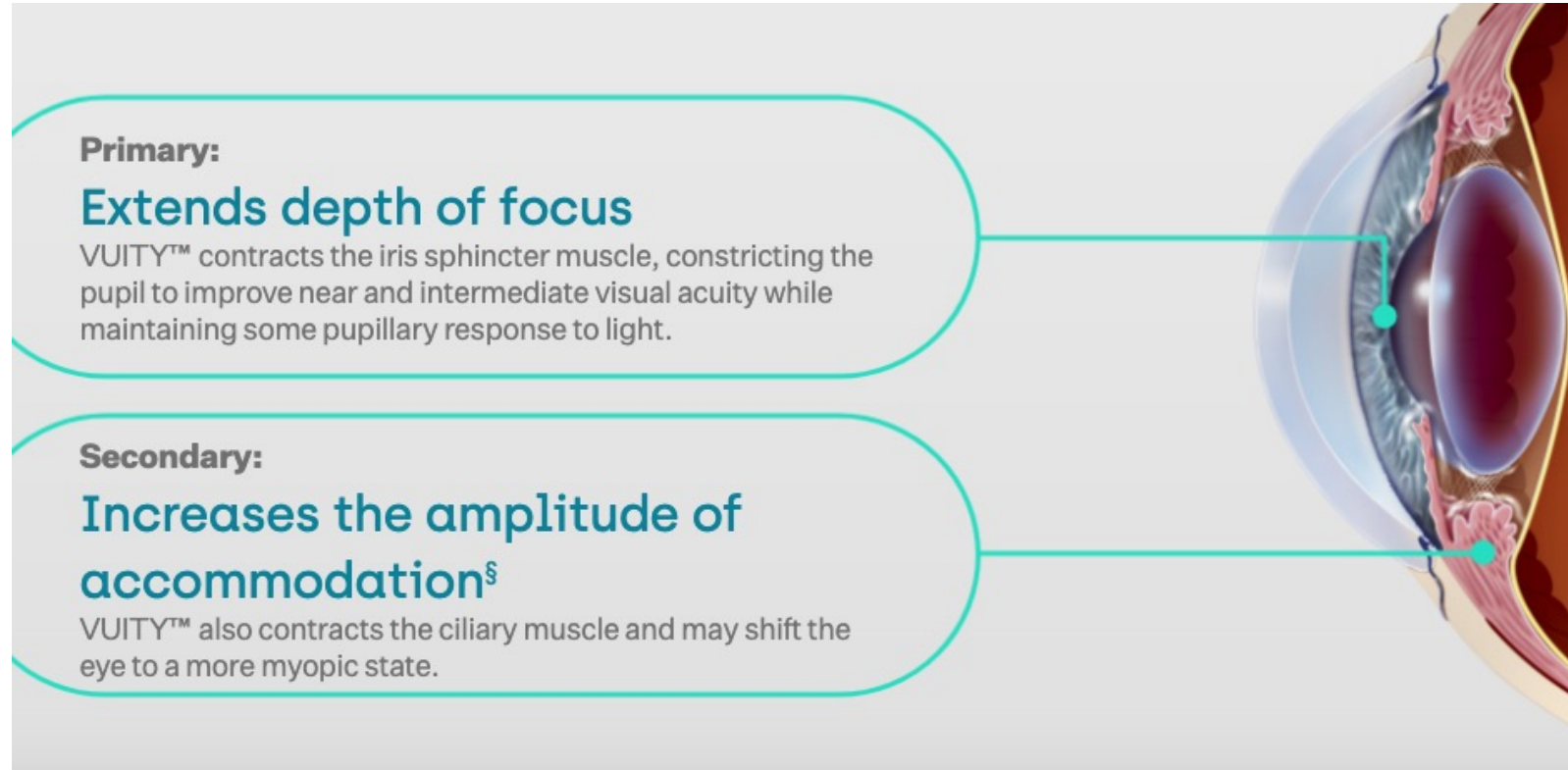
brow ache

accommodative spasm

decreased night vision

risk of retinal detachment in at risk patients

Contraindicated with iritis



Low dose atropine to slow myopia progression in children (atropine 0.01%, 0.025%, 0.05%)

- Myopia is on the rise with now 35% of the US population affected
- Off label use and purchased through compounding pharmacies
- Dose is 1 drop both eyes once a day
- Side effects are minimal: enlarged pupil , allergic conjunctivitis or dermatitis

Other options: Orthokeratology with soft contact lenses to cause peripheral defocus

Tepezza for Thyroid Eye Disease



New Drug Treats Thyroid Eye Disease Without Surgery

Leer en Español: [Un nuevo medicamento trata la enfermedad tiroidea del ojo sin cirugía](#)

By [Reena Mukamal](#)

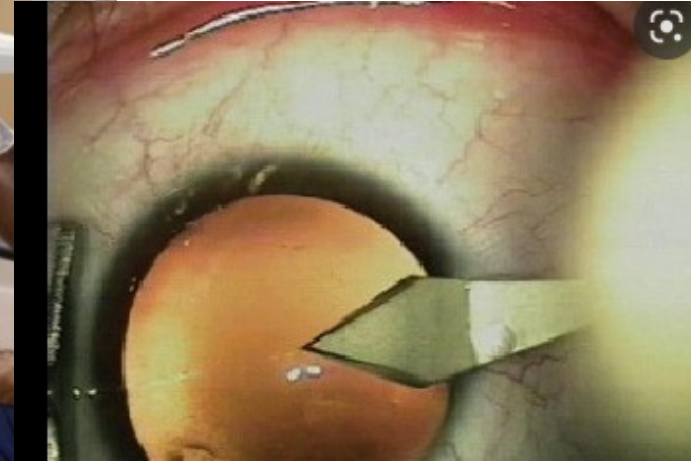
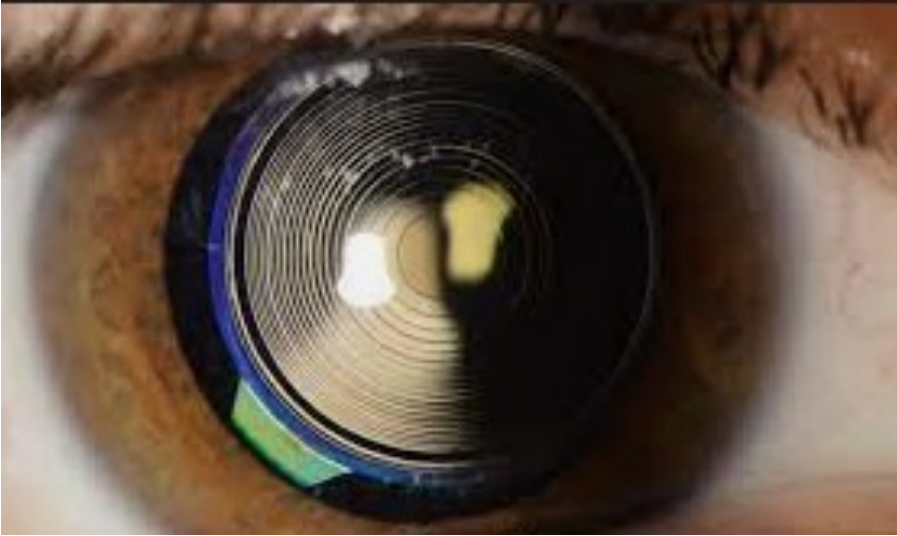
Reviewed By [Christopher E Starr MD](#)

Feb. 05, 2020

[Tepezza](#) was approved in January 2020 as the [first nonsurgical treatment](#) for thyroid eye disease (TED), a condition that causes [eye bulging and vision problems](#). The new drug is delivered through an IV and accomplishes what surgery often cannot, experts say.

"This is an exciting milestone for the treatment of this debilitating disease," said Christopher Starr, MD, an associate professor of ophthalmology at Weill Cornell Medical Center. "Many people on Tepezza had complete resolution of eye protrusion, pain and vision loss."

Premium intraocular lenses and laser assisted surgery



Systemic diseases we can detect with an eye exam

- Aneurysm
- Brain tumors
- Blood and skin cancers
- Diabetes
- Giant Cell arteritis
- Heart Disease
- High blood pressure
- High cholesterol
- Lyme disease
- Medication toxicities
- Myasthenia Gravis
- Auto-immune diseases
- Sarcoidosis
- STDs
- Sickle cell
- Stroke
- Thyroid disease
- Vascular Disease
- Vitamin A deficiency

Thank you!

