

## Grand Rounds Improving Eye Care and Outcomes for Patients

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Mackinac Island Optometric Education Consultants Sunday, August 28, 2022



#### Disclosures- Greg Caldwell, OD, FAAO

All relevant relationships have been mitigated

- •• The content of this activity was prepared independently by me Dr. Caldwell
- •• Lectured for: Alcon, Allergan, Aerie, BioTissue, Kala, Maculogix, Optovue, RVL, Heru
  - Disclosure: Receive speaker honorariums
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- •• I have no direct financial or proprietary interest in any companies, products or services mentioned in this presentation
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- •• Envolve: PA Medical Director, Credential Committee
- Healthcare Registries Chairman of Advisory Council for Diabetes
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# Optometric Public Service Announcement Pay Very Close Attention

#### 65-year-old man

- Reports a sudden loss of vision OD
- € Vision is count fingers at 2 feet OD and 20/25 OS
- APD OD grade 4
- Fundus photos OU







Anterior cham

GSTAT blood wor

- \*2-10% of all CRAO Arteritis (GCA)
- **★** Sed-rate
- **★**C-reactive protein
  - Qualitative or quar
- **★**CBC with diff

*⇔* Monitor for n

racentesis (le 24 hours)

.nbosis from Giant Cell

SOS

ularization, e

6 weeks

#### CRAO, BRAO, TIA (amaurosis fugax)

#### Acute Stroke Ready Hospital

- \* Certification recognizes hospitals that meet standards to support better outcomes for stroke care as part of a stroke system of care
- **★** Developed in collaboration with the Joint Commission (TJC), eligibility standards include:
- **★** Dedicated stroke-focused program
- \* Staffing by qualified medical professionals trained in stroke care
- \* Relationship with local emergency management systems (EMS) that encourages training in field assessment tools and communication with the hospital prior to bringing a patient with a stroke to the emergency department
- \* Access to stroke expertise 24 hours a day, 7 days a week (in person or via telemedicine) and transfer agreements with facilities that provide primary or comprehensive stroke services.
- \* 24/7 ability to perform rapid diagnostic imaging and laboratory testing to facilitate the administration for IV thrombolytics in eligible patients
- \* Streamlined flow of patient information while protecting patient rights, security and privacy
- **★** Use of data to assess and continually improve quality of care for stroke patients

#### Warn hospital if suspicion for GCA

- € 20% of stroke or heart attack within 3 years
- A However of those who experienced CVA or MI
  - **★** 80% were within 24-48 hours; those remaining
  - **★** 50% occurred in 2 weeks
  - \* Majority within the next 90 days
- ANOT PCP, not retinologist, just the Acute Stroke Ready Hospital!

#### Acute Stroke Ready Hospital

As the basic level stroke hospital, better than not certified

**★**This was created in 2015

Alf you have access to a: (Even Better)

- **★ Primary Stroke Center**
- **★**Thrombectomy-Capable Stroke Center
- **★** Comprehensive Stroke Center even better

The Joint Commission and the American Heart Association/American Stroke Association launch new stroke certification program

(OAKBROOK TERRACE, Illinois; DALLAS, Texas - July 16, 2015) The Joint Commission and the American Heart Association/American Stroke Association announce the launch of a new Disease-Specific Care Advanced Certification Program for Acute Stroke Ready Hospitals. This certification was derived from the Brain Attack Coalition's recommendations in 2013 (see "Formation and Function of Acute Stroke Ready Hospitals Within a Stroke System of Care" in the November 12, 2013 Stroke Journal)

@TJCommission and @American\_Heart have joined forces on a new Acute #Stroke Ready Hospitals Certification.



The Joint Commission began accepting applications July 1 for the new Acute Stroke Ready Hospital certification program. The certification is geared toward accredited hospitals that would not otherwise be candidates for Primary Stroke Center or Comprehensive Stroke Center certification. The goal of the

new Acute Stroke Ready Hospital certification is to recognize those hospitals equipped to treat stroke patients with timely, evidence-based care prior to transferring them to a Primary or Comprehensive Stroke Center. Facilities that earn the Acute Stroke Ready Hospital distinction will be able to display The Joint Commission's Gold Seal of Approval® and the American Heart Association/American Stroke Association's Heart-Check





#### FOR IMMEDIATE RELEASE

ADDITIONAL RESOURCES

About the Acute Stroke Ready Hospitals Certification

About Brain Attack Coalition study

About The Joint Commission

About American Heart Association/American Stroke Association

Print-friendly news release PDF

#### CONTACTS

Email

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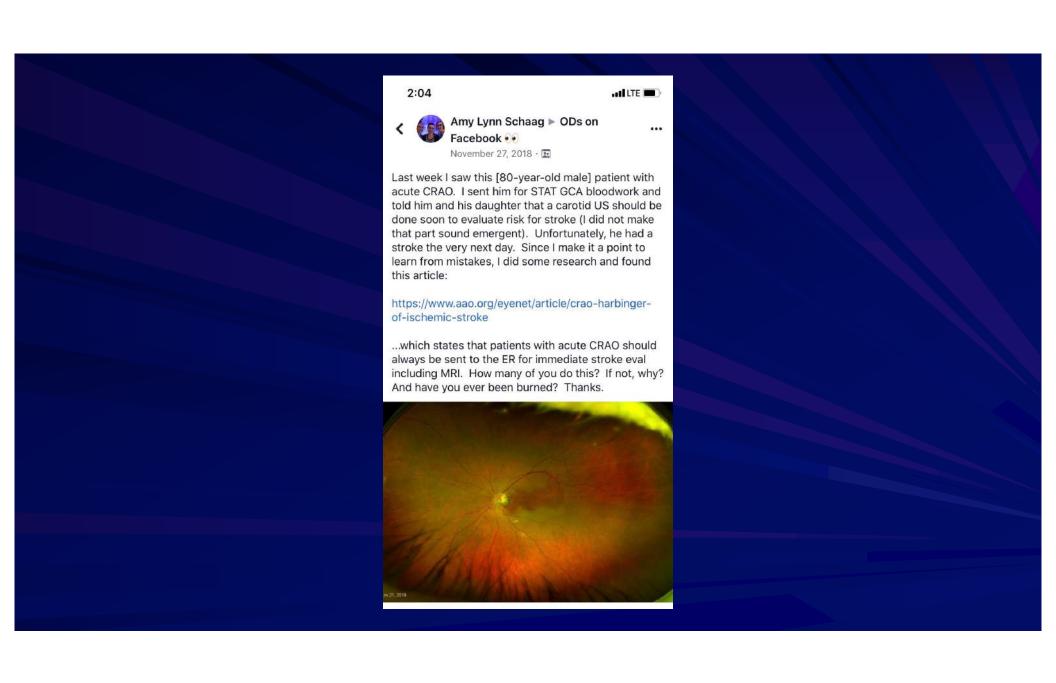




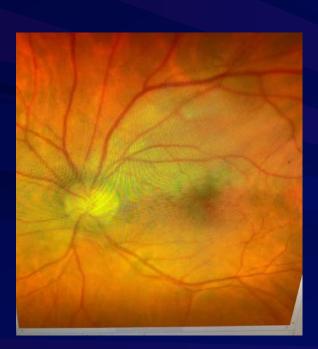


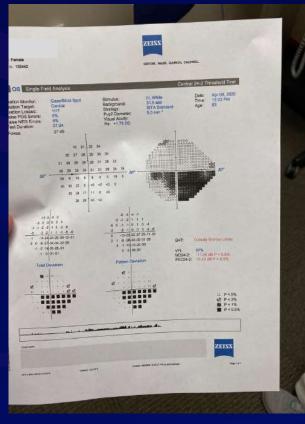


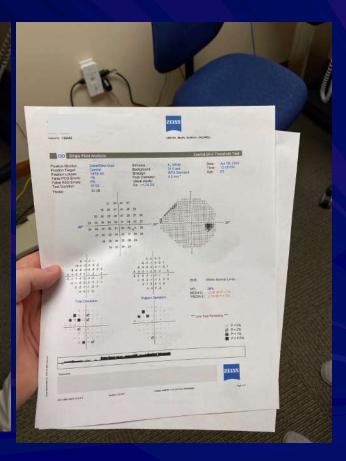
	COUNTY			Acute Stroke -ready; Comprehensive stroke Center; or Primary Stroke		CITY		ZIP	EXPIRES	
CHESTER	Phoenixville Hospital		Primary Stroke Center		Phoenixville		19460		9/24/2021	
CHESTER	Paoli Hospital		Primary	Stroke Center	Paol		19301	7/12	7/12/2021	
CLEARFIELD	Penn Highlands Healthcare - DuBois		Primary Stroke Center		DuBois		15801	7/14	7/14/2020	
CLINTON	Lock Haven Hospital		Acute Stroke - Ready		Lock Haven		17745	10/13	10/13/2020	
COLUMBIA	Berwick Hospital		Acute Stroke - Ready		Berwick		18603		7/9/2021	
CRAWFORD	Meadville Medical Center		Primary Stroke Center		Meadville		16335	3/29	3/29/2022	
CUMBERLAND	UPMC - Pinnacle Hospitals - West Shore Campus		Primary Stroke Center		Mechanisburg		17050	11/8/2021		14/2020 20/2020 25/2020
CUMBERLAND	UPMC Pinnacle Carlisle		Primary Stroke Center		Carlisle		17015	7/28/2020		/1/2020
CUMBERLAND	Geisinger Holy Spirit Hospital		Primary Stroke Center		Camp Hill		17011	8/18	/2020	19/2020
DAUPHIN	UPMC - Pinnacle Hospitals - Community Osteopathic		Primary Stroke Center		Harrisburg		17109			17/2021
DAUPHIN	UPMC - Pinnacle Hospitals - Harrisburg Campus		Primary Stroke Center		Harrisburg		17105		/2021	/8/2022 /4/2021
DELAWARE	Main Line Hospital - Riddle Memorial Hospital		Primary Stroke Center		Media		19063	8/4	/2020	25/2021 /9/2021
DELAWARE	Taylor Hospital		Primary Stroke Center		Ridley Park		19078			/9/2021
DELAWARE	Crozer Chester Medical Center		Primary Stroke Center		Upland		19013	11/6	/2021	17/2020
DELAWARE	Delaware County Memorial Hospital		Primary Stroke Center		Drexel Hill		19026	7/4	/2020	/5/2021
ERIE	Millcreek Community Hospital		Primary Stroke Center		Erie		16509	1/8	/2021	25/2020
ERIE	UPMC Hamot		Comprehensive Stroke Center		Erie		16550	7/11	/2021	26/2020
FRANKLIN	Wellspan Waynesboro Hospital		Primary Stroke Center		Waynesboro		17268	9/17	/2021	19/2021
FRANKLIN	Wellspan Chambersburg Hospital		Primary Stroke Center		Chambersburg		17201	40/40	12024	1/3/2020
INDIANA	Indiana Regional Medical Center		Primary Stroke Center		Indiana		15701	7/7	/2020	25/2021
LACKAWANNA	Regional Hospital of Scranton		Primary Stroke Center		Scranton		18510	5/7	/2021	21/2020 15/2021
LACKAWANNA	Geisinger Community Medical Center		Primary Stroke Center		Scranton		18510	5/18	/2021	12/2020
LACKAWANNA	Moses Taylor Hospital		Primary Stroke Center		Scranton		18510	11/8		/8/2020
LANCASTER	Lancaster General Hospital		Primary Stroke Center		Lancaster		17604	3/16	/2021	15/2020
LANCASTER	WellSpan - Ephrata Community		Primary	Stroke Center	Ephra	ata	17522	10	/2021	
LANCASTER	UPMC Litiz		Primary Stroke Center		Litiz		17543		/2020	
LEBANON	Good Samaritan	Good Samaritan Hospital, The		Primary Stroke Center		ion	17042		/2020	
LEHIGH		tal – Bethlehem	The state of the s	sive Stroke Center	Bethlel		18015		/2020	

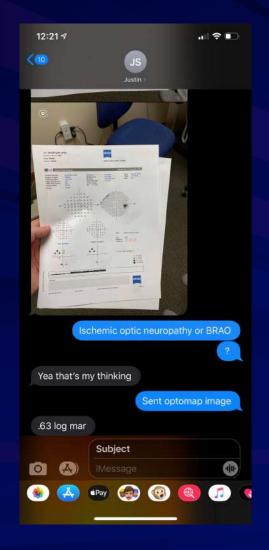


#### April 8, 2020 - COVID 19



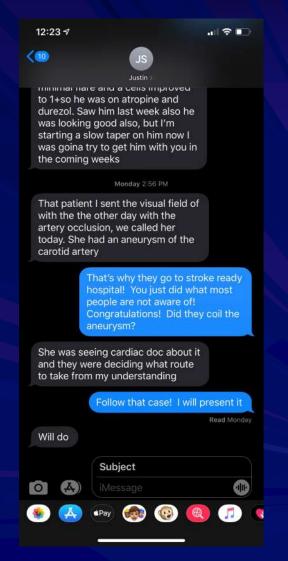




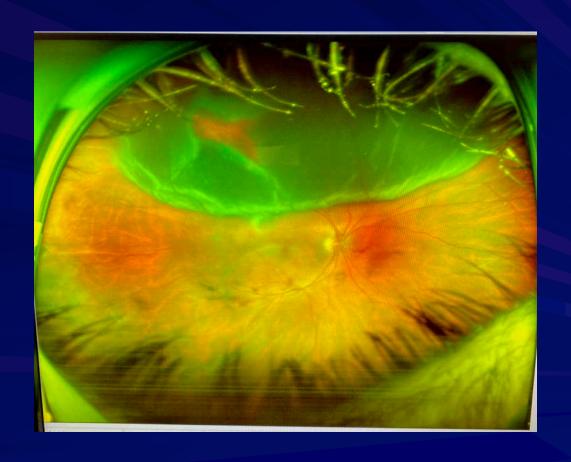


#### April 8, 2020 - COVID 19





#### April 5, 2020 – COVID 19 Times



#### Patient reports vision loss 14 days ago



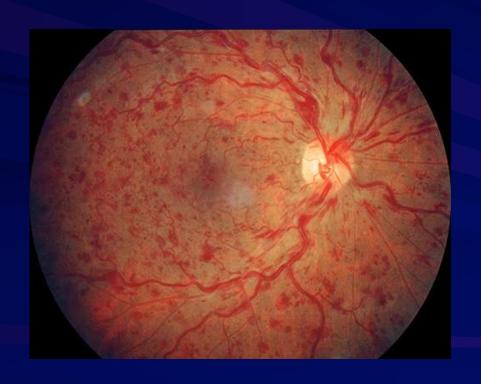




#### BRAO



#### Does this apply to retinal vein occlusions?





# Case 2

#### 25-year-old man

- Patient has been to 3 ophthalmologists and 1 optometrist in the past year
- Patient complains of a "ghost image" OS
- A Has had 4 dilated exams in past year, and no diagnosis yet
- He is very passionate that his vision is clear OD and "ghosty" OS
  - **★** He wants to know why

#### "Ghost Image" OS

Va 20 20 cc 20

Current Correction R -2.50-1.00 x 180 L -3.25-1.00 x 180

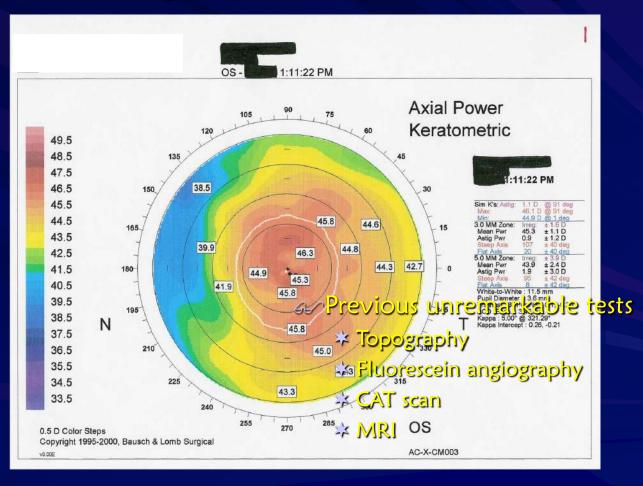
EOMS: full, unrestricted CT: ortho D/N

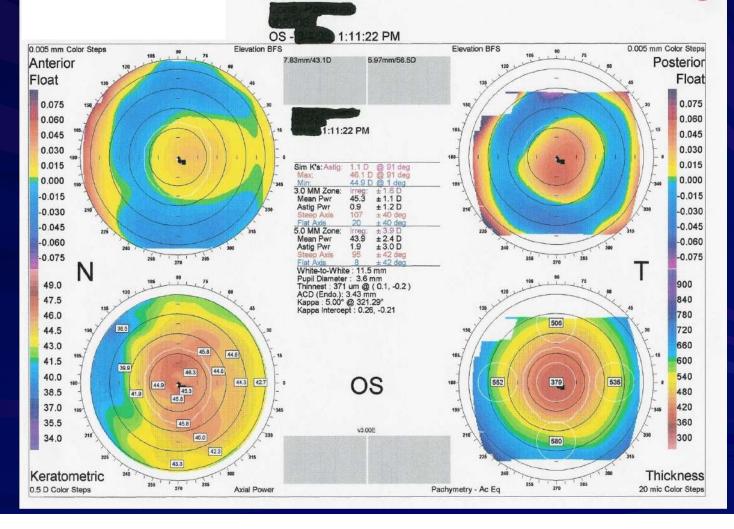
PERRL (-)APD CF: full by FC OU

 Previous unremarkable tests

- **★** Topography
- **★** Fluorescein angiography
- \* CAT scan
- \* MRI

#### Any Thoughts About "Ghost Images"?





### How I felt when I finally realized keratoconus starts posteriorly



#### Forme Fruste Keratoconus

- **Treatment**
- RGP lens in office and trial frame over refraction
  - **★**Eliminated "ghost image"
- Patient currently only in spex
  - **★**Not interested in RGP lens
- RTC 1 year, BVA and topographies



#### Advanced Keratoconus

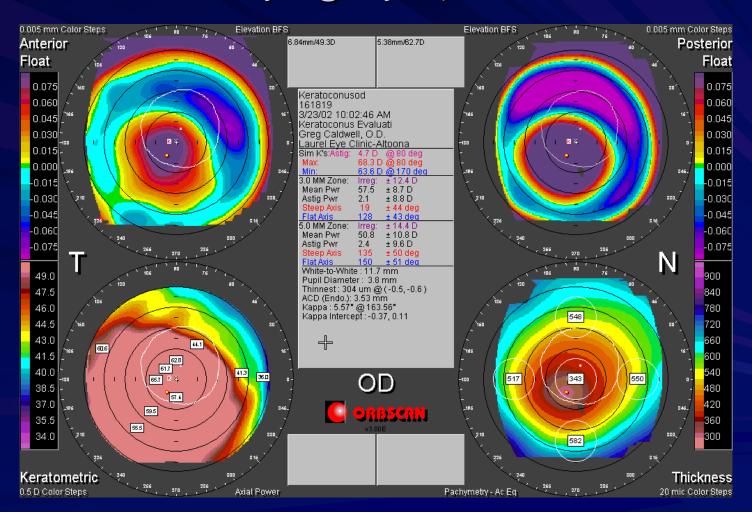




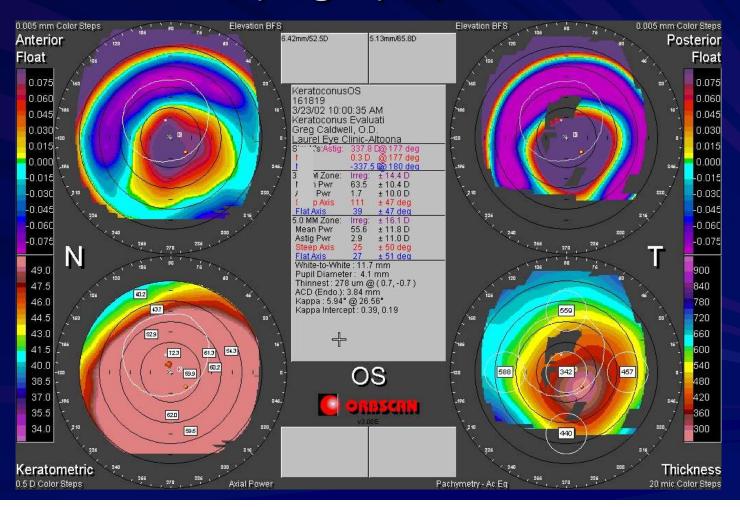




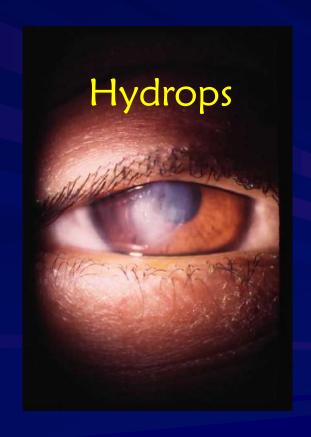
#### Topography OD



#### Topography OS



What happens when the posterior cone gets too steep and Descemet's membrane ruptures?





# The following video is rated "E" for Educational

#### Keratoconus

#### Progressive corneal disease

- \* Focal thinning, steepening, bulging, and irregular shape
- **★** Loss of biomechanical strength
- **★** Bilateral, asymmetric, clinically non-inflammatory
- Caused by a combination of genetic and environmental factors
  - **★** Allergies and eye rubbing

#### 

- \*Typically progressive to 4<sup>th</sup> decade of life
- ★ Previously estimated 1:2000 (1986 US), more recent estimate 1:375 (2017 Netherlands)

Normal





Photos courtesy of Dr. John Gelles, O.D. of CLE

KC





Vision management options do not stop disease progression

#### Importance of Early Diagnosis in Keratoconus

- As keratoconus progresses, it becomes more challenging to manage
- Progressive keratoconus often results in:
  - Loss of visual acuity
  - Decreased tolerance to contact lens wear, caused by the ongoing changes in the cornea
- The earlier progressive keratoconus is diagnosed, the sooner treatment can be provided that may slow the progression of the disease.<sup>1</sup>



- Important to diagnose and educate patients before visual function is lost
- CXL is an early intervention intended to slow or halt the progression of keratoconus

#### Watch Out for Keratoconus!

8 Potential Signs & Symptoms

Typically onset occurs in teenage years or early twenties







Frequent Changes in Refraction or Increasing Cylinder



Family History of Keratoconus



Reduced Best Corrected Visual Acuity



**Excessive Eve** Rubbing



Frequent Headaches



**Difficulty Seeing** at Night



Halos and Ghosting



Increased Light Sensitivity

If you believe a patient may have keratoconus, perform a diagnostic exam or Find An Expert at LivingwithKC.com to refer them for a KC screening.

(844) 528-3376 info@avedro.com www.LivingwithKC.com



#### LOOK OUT FOR KC!

- ▶ Look out for warning signs in medical history
  - History of eye rubbing
  - Family & genetic predispositions
- ▶ Look out for visual complaints
  - Blurred vision
  - Distortion of images
- ▶ Look out for refractive anomalies
  - Distortion of mires on keratometry
  - Error messages on autorefractors
  - Unsatisfactory attempts at vision correction & progressive loss of UCVA & BCVA
  - Increasing astigmatism

#### Cross-linking Procedure Summary



1. Remove epithelium



2. Soak cornea Photrexa® Viscous (riboflavin 5'-phosphate in 20% dextran ophthalmic solution) for 30 minutes



**4.** Once flare is observed, measure corneal thickness

If corneal thickness is less than 400 um, instill 2 drops of Photrexa (riboflavin 5'-phosphate in ophthalmic solution) until the corneal thickness increases to at least 400 µm



3. Check for flare

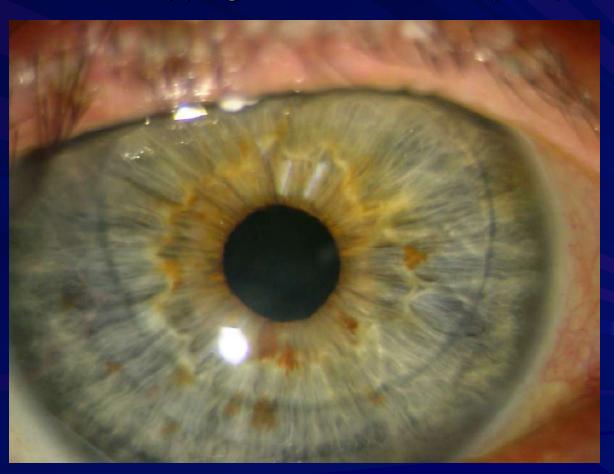


5. Irradiate for 30 minutes

Continue applying Photrexa Viscous (riboflavin 5'-phosphate in 20% dextran ophthalmic solution) during irradiation.

\* Refer to prescribing information for entire FDA-approved procedure

#### Descemet's Stripping Endothelial Keratoplasty DSEK





## 28-year-old man

- & Had LASIK 14 months ago
- AHis right eye is now very blurry
- He tried calling for an appointment the center is now closed

Va 20 / 40

**Current Correction**  $R + 0.50 - 7.00 \times 040$ L-0.25 sphere

EOMS: full, unrestricted PERRL (-)APD

CT: ortho D/N

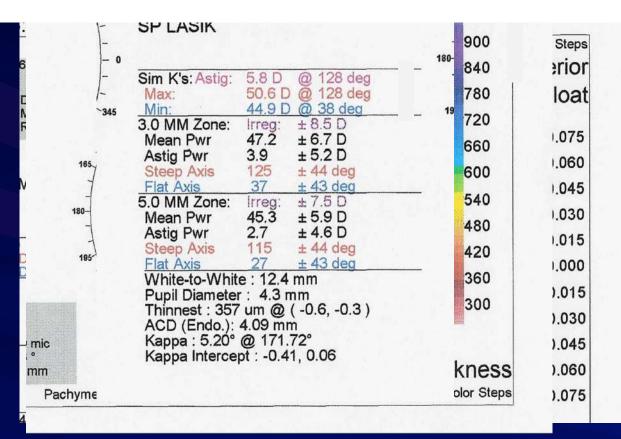
CF: full by FC OU

SLE-trace fibrosis at flap edges, no stain

SLE-few multi-directional striae OD>OS

SLE-clean interface OU

Fundus-unremarkable



graphy DD

& Diagnosis:

**★** Keratectasia 2° LASIK

**GAT RGP OD 20/20-2** 

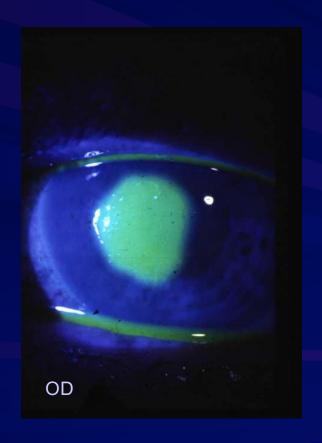
- \* This lasted for about 3 months
- **★** Multiple RGPs later due to progression of astigmatism to 8.5 D (BVA 20/50-2)
- **★** Finally PKP was done Jan 2006

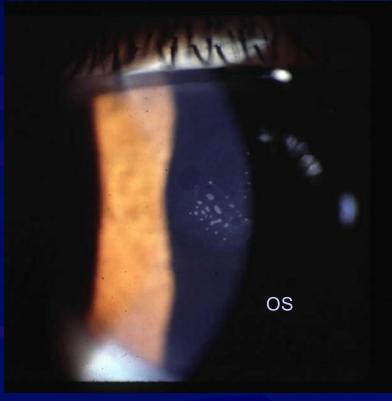


# 43-year-old man

- Called your office today
- Eye pain in the right eye since this morning
- GOD 20/80 OS 20/20
- & Externals: normal
- Review of Systems: unremarkable

# Slit Lamp Evaluation



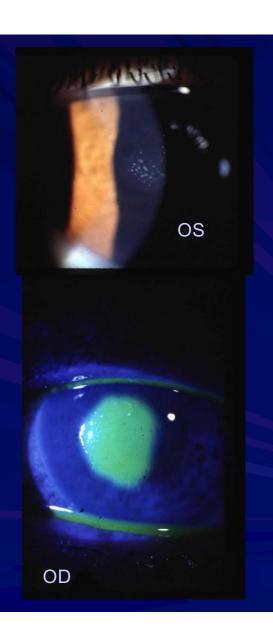


# 43-year-old male further history reveals

- Fourth time in past 24 months
- & Uses Muro 128
  - **★** Gtts qid
  - **★** Ung qHS

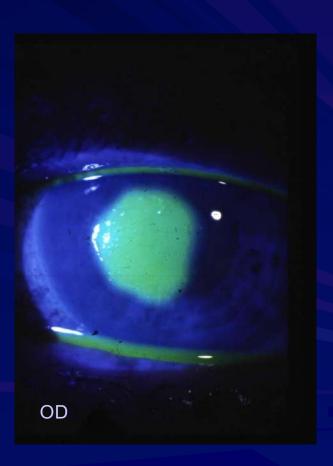
#### 

★ Recurrent Corneal Erosion secondary to Epithelial Basement Membrane Dystrophy (EBMD)



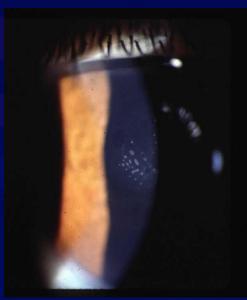
#### Treatment

- Antibiotic, topical
- A Pain management
  - **★** Depending on severity
    - Bandage contact lens
    - 🖺 Oral ibuprofen (200 mg) (16)
      - Maximum 3200 mg daily
    - © Oral acetaminophen (500 mg) (6)
      - Maximum 3000\* mg daily
    - © Oral narcotic (need DEA number)
      - Lortab (500/5)
      - They provide good pain relief
      - A degree of sedation
      - Tend to minimally impact the digestive system and kidneys
      - It's not that they're dramatically more potent than OTC analgesics like aspirin, acetaminophen, ibuprofen or naproxen
    - Topical NSAID



# Review of Map-Dot-Fingerprint







## Treatment Options

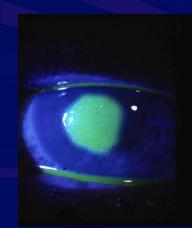
(Once Abrasion Resolved, to Help Prevent Recurrence)

When is it time for surgical procedure?

- & Medically
  - \* Hypertonics
    - ☐ Gtts
    - 🗓 Ung
  - ★ Bandage contact lens
    - Nocturnal
  - **★** Doxycycline/Minocycline
  - **★** Amniotic membrane (PROKERA™)
- - \* Anterior stromal micropuncture
  - \* Debridement
    - **†** Chemically
    - Mechanically
      - Beaver blade/diamond burr
  - **★** Excimer phototherapeutic keratectomy (PTK)



Answer: medical treatment failure



# The Basics of Amniotic Membrane

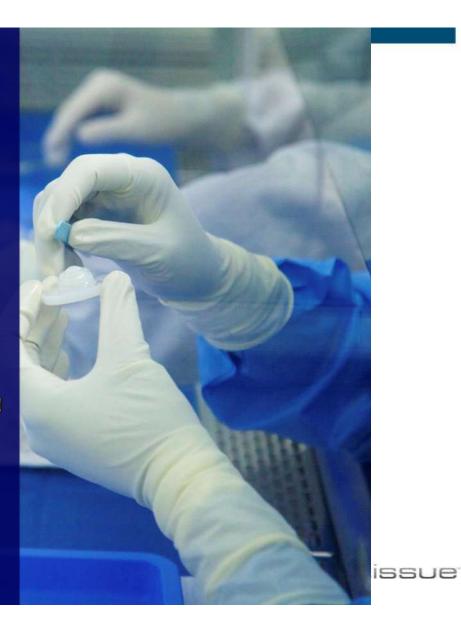
### The Amniotic Membrane

- The amniotic membrane is the innermost lining of the placenta (amnion)
- Amniotic membrane shares the same cell origin as the fetus
  - Stem cell behavior
- Structural similarity to all human tissue



#### The CRYOTEK™ Method

- Patented and proprietary cryopreservation
- Ensures key active components of the <u>Extracellular Matrix</u> (ECM) are retained
- The **only** method that retains both:
  - The integrity of the tissue structure
  - The key active (ECM) components
- Safe and effective
  - Supported by over 300 peer-reviewed articles
  - Over 100,000 implanted
- Bio-Tissue Cryopreserved Amniotic
   Membrane is the ONLY AM granted
   wound healing indication by the FDA.



### Technology Highlights

Impressive regenerative platform that possesses natural growth factors and optimal scaffolding properties within a complex extracellular matrix that are:

- Anti-inflammatory
- Anti-scarring
- Anti-angiogenic

#### Therapeutic actions:

- Promotes Stem Cell Expansion
- Suppresses pain
- Promotes cellular migration
- Expedites recovery



# PROKERA®: BIOLOGIC CORNEAL BANDAGE

- PROKERA® utilizes the proprietary CryoTek™ cryopreservation process that maintains the active extracellular matrix of the amniotic membrane which uniquely allows for regenerative healing.
- PROKERA® is the only FDA-cleared therapeutic device that both reduces inflammation and promotes scar less healing
- PROKERA® can be used for a wide number of ocular surface diseases with severity ranging from mild, moderate, to severe



### PROKERA®: Biologic Corneal Bandage **An Active Amniotic Membrane**

PROKERA Slim

PROKERA PLUS



- (Microbial, HSV)
- **Recurrent Corneal Erosions**
- Corneal Abrasions / Wounds



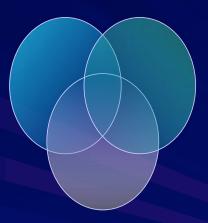
- Neurotrophic PED
- Severe Infectious Keratitis
- Post DSEK for Bullous
- **Corneal Wounds**



- **Chemical Burns**

#### Excimer Phototherapeutic Keratectomy (PTK)

- & Corneal Opacities
  - \* Scarring
  - **★** Granular dystrophy
- Surface Irregularity
  - \*Saltzman nodules
- & Surface Breakdown
  - \* Epithelial basement membrane dystrophy



### PTK Procedure

- Removal of epithelium
- Manual debridement
- & Polish with excimer

# PRK



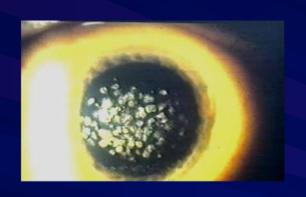
# PTK



## Post op Regimen

- - **★**Until wound is closed
- ⊕ Bandage contact lens (BCL)
- & Vitamin C, 1000 mg/day x 1 month
- ANP-artificial tears
- Sunglasses in any UV

## Before & After











## 84 year old woman

Right eye red and painful

Started about 10 days ago

See photos for discussion

# Diagnosis? Treatment?





## 1 Week Later





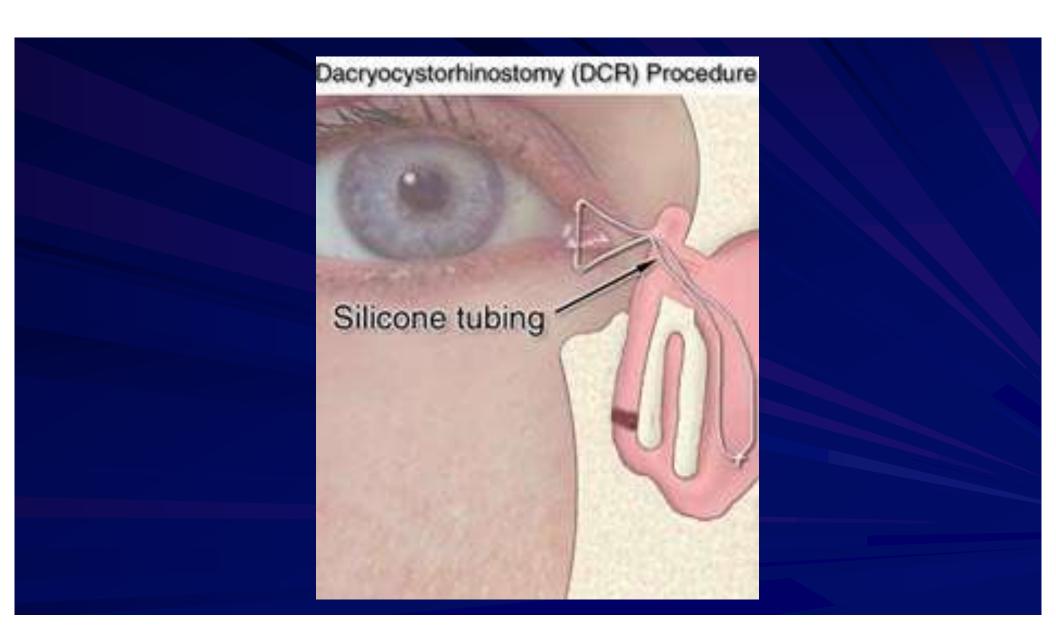




Treatment Plan? Reminder 1 week ago

\*Continue with topical and oral antibiotics

**★** Surgical consult for dacryocystorhinostomy (DCR)



# After Dacryocystorhinostomy (DCR)





# Tube Removal





## 35-year-old man

- Wants another opinion due to "hemorrhage on my right eye"
- A Happened 3 days ago after vomiting
  - \*Claims food poisoning from chicken Caesar salad
  - **★** Still feels a little nauseated
- eye and it should go away in 1-2 weeks

## 35-year-old man

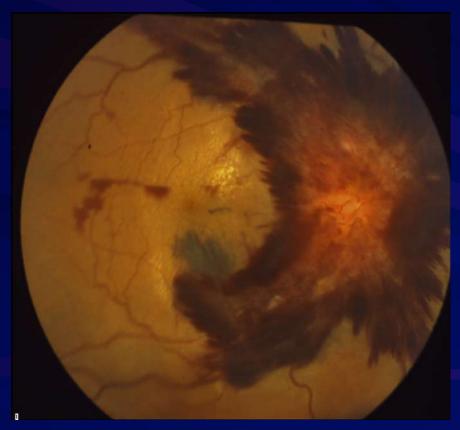
- **GAY BVA 20/100 OD, 20/70 OS** 
  - **★** Hx of amblyopia OD
  - \* Current Rx OD +5.50 OS +4.50
- Any concerns?
- A Patient noticed blurry vision OS
  - \* Started 2 weeks ago
  - \* Did not mention because he is more concerned about the blood on his right eye
- A Headaches for 2 weeks, decrease if patient stands up
- ⇔ ROS: unremarkable
- ← Decide to dilate OU

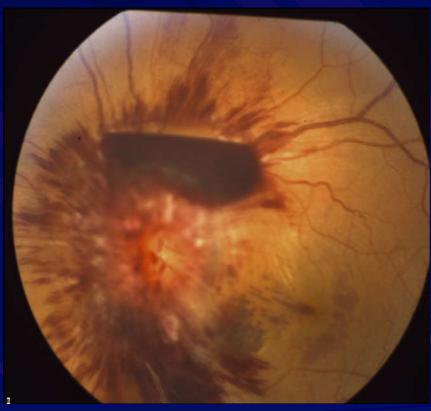






# Retinal Findings





## Differential Diagnosis

- A Hypertensive retinopathy
- & Blood dyscrasia
- Terson's syndrome
- & Valsalva retinopathy
- Purtscher's retinopathy
- Shaken baby syndrome

# Terson's Syndrome

- Terson's syndrome originally was defined by the occurrence of vitreous hemorrhage in association with subarachnoid hemorrhage
- Terson's syndrome now encompasses any intraocular hemorrhage associated with intracranial hemorrhage and elevated intracranial pressures
- Intraocular hemorrhage includes the development of subretinal, retinal, sub-hyaloidal, or vitreal blood
- The classic presentation is in the sub-hyaloidal space

#### Treatment

- Emergency referral to neurologist due to high suspicion of intracranial hemorrhage and elevated intracranial pressure
- Alntracranial hemorrhage confirmed with MRI
- Patient later diagnosed with Hairy Cell Leukemia and cryptococcal meningitis



# 8-year-old girl

- AMOM noticed the left eyelid has become red and has pimples
- Started two days ago
- Slowly getting more pimples on the eyelid
- & Globe not affected

# Slit Lamp Evaluation



#### & Diagnosis

- **★** Herpes simplex blepharitis
- **Treatment** 
  - **★** 400 mg Acyclovir 5x/day
  - **★** Call to pediatrician



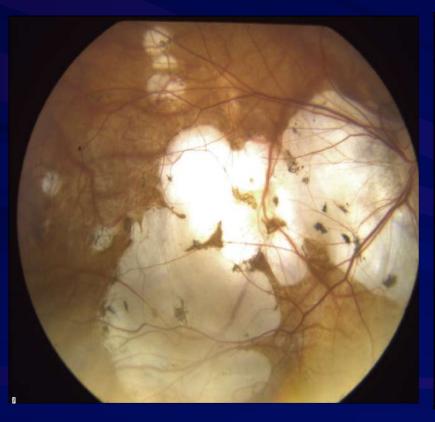




### 58-year-old woman

- «VA OD 20/200 OS 20/400
- & Longstanding history of macular degeneration
- Anything suspicious here?
  - ★?? Longstanding AMD in 58-year-old??
- & History of cataract surgery OU
- Glasses Rx OD -1.00 OS -1.00

# Axial length 29.85 mm





OD -18.00 OS -18.50 prior to cataract surgery

#### Let's chat



At what diopter value is a patient considered a degenerative or pathological myope?

## Degenerative Myopia

- Differs from refractive myopia
  - \*There is an alteration of globe structure that is progressive
  - \*Primary alteration is a posterior elongation of eyeball as a result of progressive thinning of sclera
    - Posterior staphyloma

## Degenerative Myopia

#### **Findings**

- **★** Lacquer cracks
- **★** Posterior staphyloma
- **★** Fuch's spot
- **★ RPE** and choroidal atrophy
- **★** Scleral crescents
- **★** Vessel straightening
- **★** Disc tilting
- **★** Peripheral retinal changes

Can be found in refractive and degenerative myopes

# Conditions Associated With Degenerative Myopia

- & Fetal Alcohol Syndrome
- & Ocular albinism
- & Down's Syndrome
- & Low birth weight
- Alnfantile glaucoma
- Retinopathy of Prematurity
- Marfan's Syndrome

#### Treatment

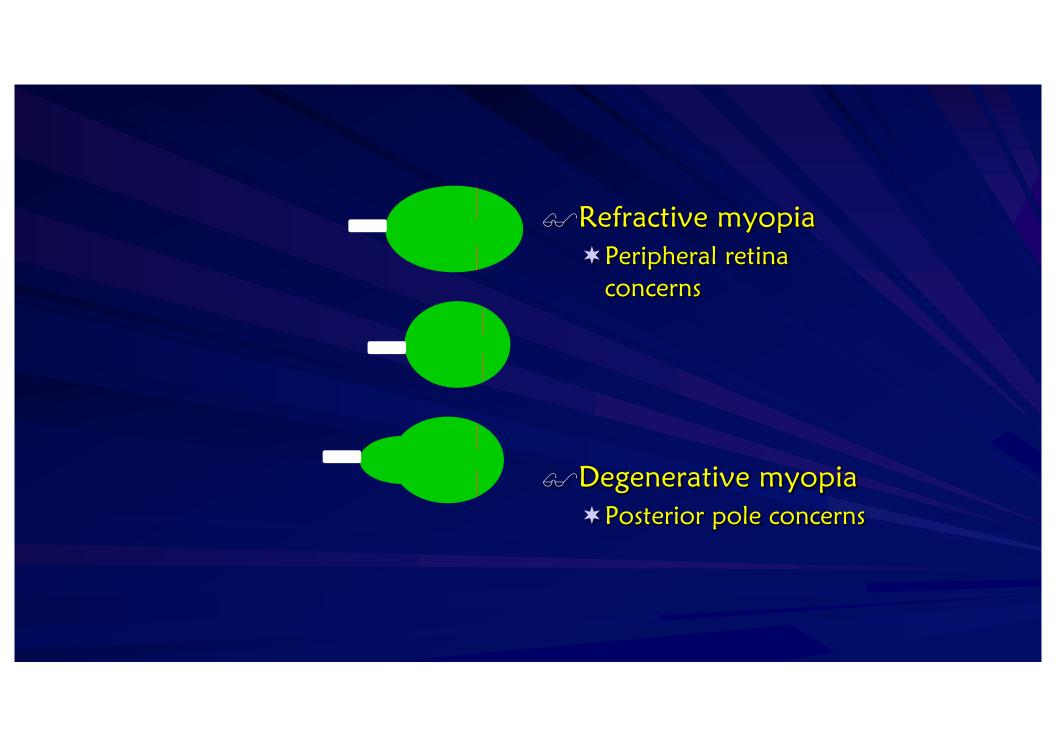
- GABVA with glasses/contact lenses
- Education regarding trauma and possible eye hazards
- Monitor for neovascularization and peripheral retinal changes
- & Follow-up at least yearly

# Poll 5 - Which patient is at higher risk of retinal detachment?



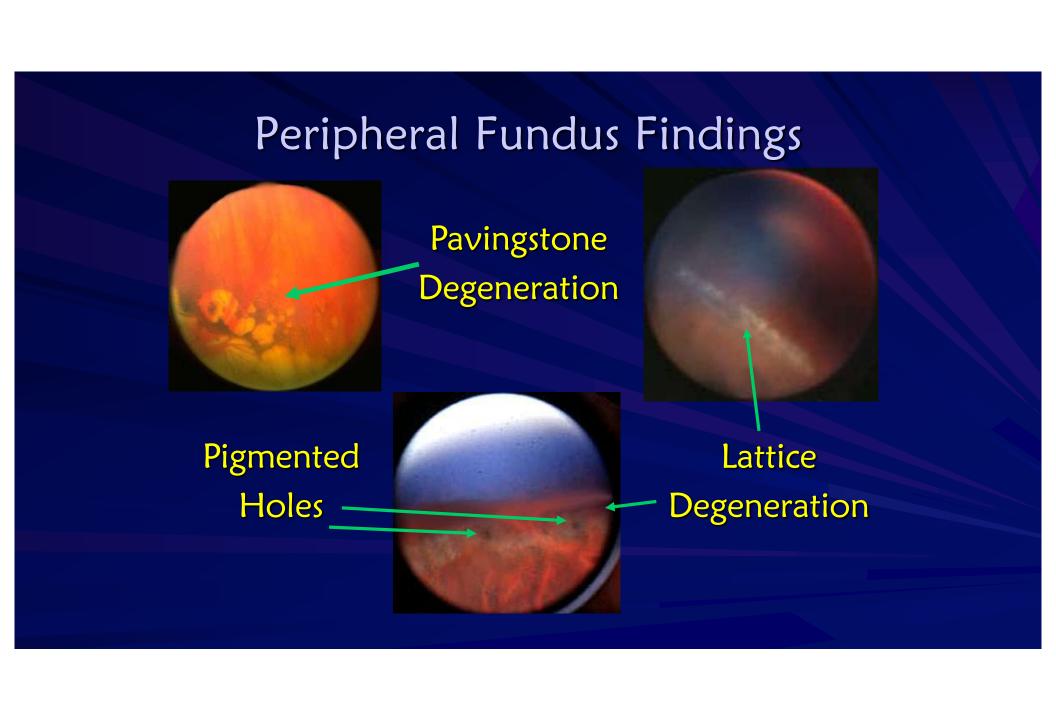
Two patients are in your office -8.00 D axial myope

-14.00 D degenerative myope



#### Clinical Pearl

- Refractive myopia
  - \*Peripheral retina is general concern
- Degenerative/Pathological myopia
  - **★**Posterior pole is general concern
    - Posterior staphyloma





88-year-old man I see faces of friends that I have not seen for years, wheels of cars and at times pine trees

**BVA** Count fingers at 2 feet OU **Current Correction** R plano L -1.00 sphere

EOMS: full, unrestricted PERRL (-)APD

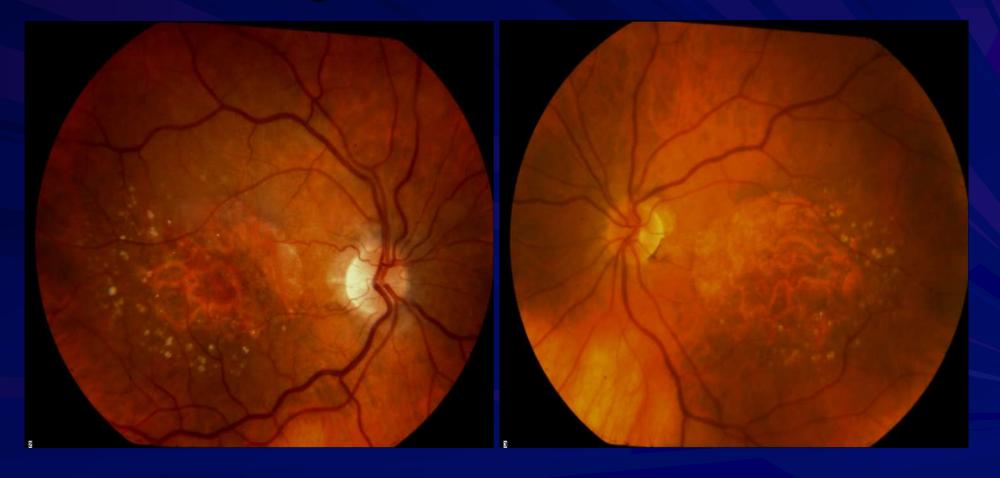
CT: ortho D/N by Hirschberg CF: central defect OU

## Poll 6- Recommend psyche consult?

#### Alert and Oriented x 3

- \* Person
  - Throws who he is, who is with him
- \* Place
  - Thows where he is, knows where he lives
- \*Time
  - The Knows what month, day, date and year

# Diagnosis and Treatment?



# Charles Bonnet Syndrome "Release Hallucination"

- & Visual hallucinations
  - **★**Irritative (brief)
    - **†** Epilepsy
    - Migraine
  - **★**Release (continuous)
    - ☐ Stroke
    - ☐ Sensory deprivation

#### Treatment

#### Reassurance

\*That this is normal for patient with severe vision loss to experience hallucinations

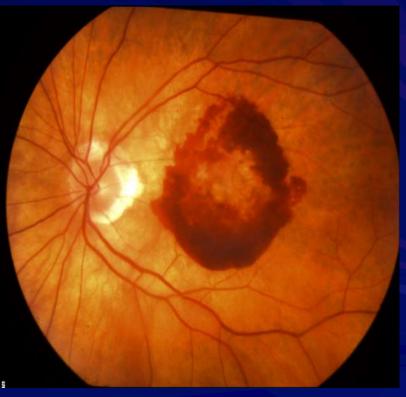
#### & Clinical Pearl

\*Any patient 20/100 or worse in better eye Ask the patient



# Clinical Pearl Is there a difference between Geographic Atrophy and Disciform Scar







#### **Questions Thank You!**

# Grand Rounds Improving Eye Care and Outcomes for Patients

Greg Caldwell, OD, FAAO

Mackinac Island Optometric Education Consultants Sunday, August 28, 2022

