SUNCOAST SEMINAR

Presented by the
Pinellas Optometric Association

Course Syllabus

Suncoast Seminar 2024
Schedule of Events

Saturday, April 27, 2024

7:45 am – 8:15 am	**Registration** **Continental Breakfast** - *sponsored by Eye Institute of West Florida* **Exhibit Hall** open
8:15 am – 9:55 am	**Co-Managing the Light Adjustable Lens (90938-PO)** T. Hunter Newsom, M.D., Brian Szabo, D.O., and Eric Fazio, O.D.
9:55 am – 10:40 am	**Break** - *sponsored by Updegraff Vision* **Exhibit Hall** open
10:40 am – 12:20 pm	**Emerging Trends in Macular Disease (TQ) (90790-TD)** Sherrol A. Reynolds, O.D.
12:20 pm – 1:10 pm	**Lunch** - s*ponsored by St. Luke's Cataract & Laser Institute* **Exhibit Hall** open
1:10 pm – 1:20 pm	**Lighthouse of Pinellas Update**
1:20 pm – 1:30 pm	**F.O.A. Update**
1:30 pm – 3:10 pm	**Eye on Systemic Disease (TQ) (90791-SD)** Sherrol A. Reynolds, O.D.
3:10 pm – 3:30 pm	**Break -** *sponsored by Sight360*
3:30 pm – 5:10 pm	**The ODs Role in Diabetes (TQ) (86739-TD)** Sherrol A. Reynolds, O.D.

Sunday, April 28, 2024

7:30 am – 8:00 am	**Registration** **Continental *Breakfast*** - *sponsored by Next Vision Instruments*
8:00 am – 9:40 am	**Neural Pearls (TQ) (89379-NO)** Joe Sowka, O.D.
9:40 am – 10:00 am	**Break** – *sponsored by Suncoast Seminar*
10:00am – 11:40 am	**Prevention of Medical Errors (89825-EJ)** Joe Sowka, O.D.
11:40 am – 12:00 pm	**Break** – *sponsored by Suncoast Seminar*
12:00 pm – 1:40 pm	**Florida Jurisprudence (89275-EJ)** Joe Sowka, O.D.

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You deserve NEWSOM EYES!

Financial Disclosures

T. Hunter Newsom M.D.

- Lenstec
- RxSight
- Alcon
- Staar

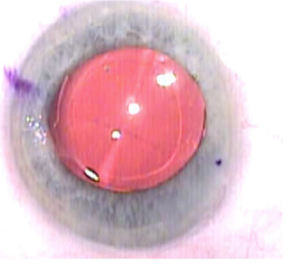
Eric Fazio O.D.

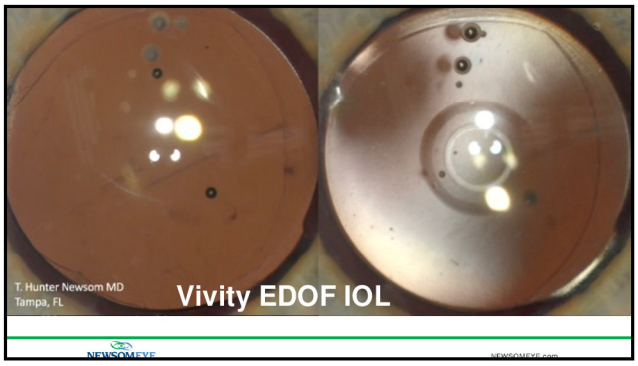
- RxSight
- Staar

The last 8 years of research at Newsom Eye

- Segmented Bifocal IOL
  - PI FDA trials
- Vivity EDOF IOL
  - First Vivity IOL in North America
  - Principal Investigator FDA trials
  - Mini Monovision post FDA study
- Light Adjustable IOL
  - Principal Investigator FDA trials
  - PI FDA trials for EDOF LAL
- PanOptics / ReStor Toric multifocal
  - Post FDA clinical trial
- Newsom Bladeless Cataract Surgery
  - Invented Technique for Laser Cataract Sx
  - Initial nomogram development Femto LRIs
- Presby Drops FDA trial Allergan
- Varion glasses FDA trial
- Collagen Cross Linking Epi On FDA trials
- EVO Visian ICL

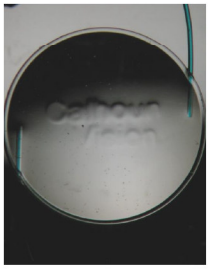
Segmented Bifocal Lens (SBL)



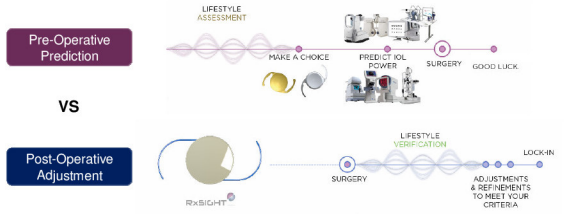


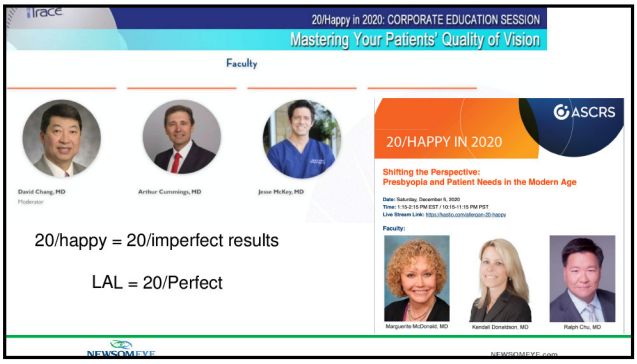
Light Adjustable Lens (LAL)

- 3-piece IOL design
- Blue PMMA modified-C haptics
- Photosensitive silicone
- 6.0mm biconvex optic
- Overall length 13.0mm
- Diopter Power: +10.0 to +30.0 D
- Posterior layer UV absorber
- Optic edge: Square and Round



A **Better Way** to Deliver Premium Cataract Surgery



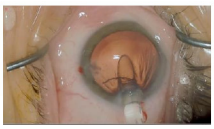


20/happy = 20/imperfect results

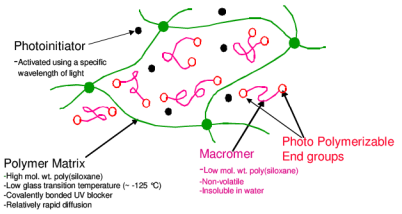
LAL = 20/Perfect

LAL Surgery

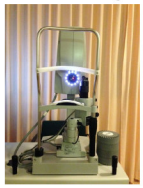
- **Standard cataract implant procedure**
- **Surgery scheduling:**
  - Schedule the second eye one week after the first
  - Let both eyes heal for ~two weeks
- ***At this point the co-managing OD needs to see the patient and:
  - Get a killer refraction
  - Measure IOP and check health just like any other postop cataract
  - If any issue please communicate quickly with Dr. Fazio (cell)
  - 1 week after Comanaged OD refraction adjustments start
  - All treatment visits for LDD are already scheduled

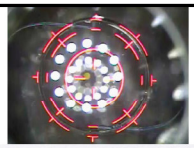


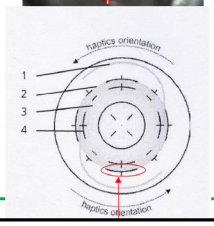
Description of Technology: LAL Composition



Light Adjustable Lens







Myopic Hyperopic Astigmatic

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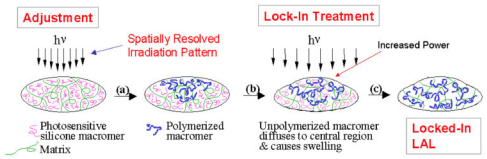
How does it work?



NOTE: 365 nm ultraviolet light

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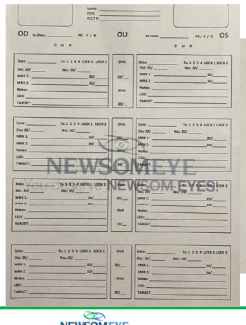

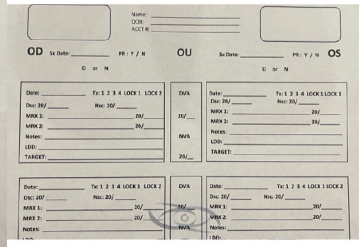

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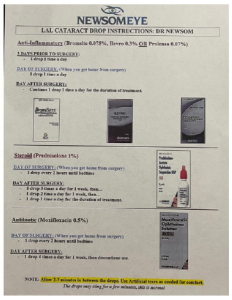

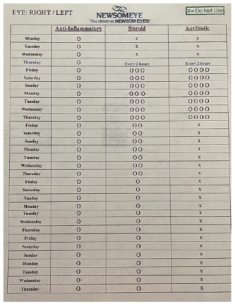

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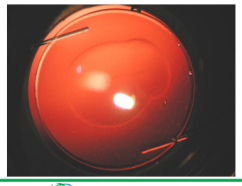
UV Glasses Compliance

UV blocking glasses post-op

Prevents polymerization



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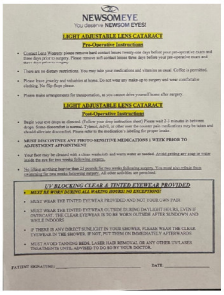

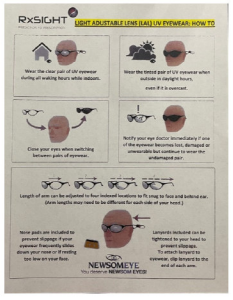

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Introducing a New Level of UV Protection in the Light Adjustable Lens

ActivShield UV Protector

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ActivShield™ is a revolutionary UV protection layer built into the newly updated Light Adjustable Lens®

ActivShield™ UV Protector

How does it work?

During light treatments, the ActivShield automatically opens to allow delivery of the precise light from the Light Delivery Device to adjust the lens. After the treatment is complete, ActivShield is automatically engaged to once again protect the lens from outside UV rays.

Patient Selection

Any patient that desires the best quality of vision

Post Refractive Surgery / Type A personality

Understands and willing to commit to the process

Compliance with UV Glasses

Pupils dilate to 6.5 mm

No h/o herpes keratitis

LAL Designed for Predictable Personal FDA Results (n=29)

Monocular UVCA one week post lock-in #2:

93% (27/29) of eyes achieved 20/20 or better (Alcon Toric 38%)

100% (29/29) of eyes achieved 20/25 or better

MRSE one week post lock-in #2:

70% (20/29) of eyes within +/- 0.25 D of plano

100% (29/29) of eyes within ±0.50 D of plano

Refractive Accuracy of first 172 eyes

The refractive accuracy of these 86 subjects was excellent.

The table to the right shows the mean residual refractive error at Lock-in for these subjects.

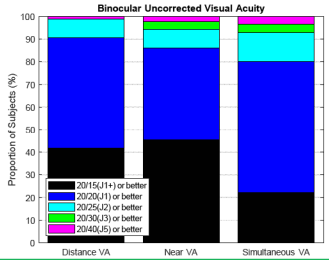
	Near Eye (N = 86)	Distance Eye (N = 86)	All Eyes (N = 172)
Mean Residual Cylinder (D)	0.08	0.07	0.08
Mean Residual Absolute MRSE from Target(D)	0.11	0.18	0.14

Post FDA Visual Outcomes (First 172 eyes)

Uncorrected Binocular Visual Acuity at Distance and Near was measured at visits after all refractive adjustments were complete.

The outcomes of these 86 subjects most recent visit is shown on the right.

We see over 80% (69/86) subjects saw at least 20/20 at distance and J1 at near.



Patient Directed Anisometropia

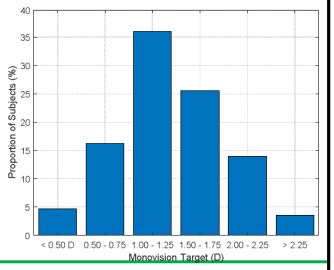
86 bilateral subjects

Mean anisometropia 1.29 D

Patient Directed Targets

Dominant eye Plane O

Non Dominant -1.25 D



Customized Monovision

During the course of light treatments, 73% of these 86 subjects chose to change the amount of anisometropia.

On average, subjects chose to increase the anisometropia by 0.37 D.

The table to the right shows initial and final target anisometropia by percentage of subjects with that starting amount.

Final Anisometropia Target (D)	Initial Anisometropia Target (D)			
	< 0.50 D (N = 7 (8%))	0.50 - 0.75 D (N = 30 (35%))	1.00 - 1.25 D (N = 36 (42%))	1.50 - 1.75 D (N = 13 (15%))
< 0.50 D	57%	0%	0%	0%
0.50 - 0.75	43%	77%	8%	0%
1.00 - 1.25	0%	43%	47%	8%
1.50 - 1.75	0%	23%	22%	54%
2.00 - 2.25	0%	3%	19%	31%
> 2.25	0%	3%	3%	8%

It's all about the Method

Conventional Cataract Surgery 1st Eye, 2nd Eye 1 week Later

3 weeks post op 1st Eye back to Comanaging OD for Quality MRX—**MUST HAVE**

Do not discuss Monovision

First we get the distance than we get the near

As we give you more near you will lose some distance

Any routine post op concerns patients directed to Comanaging OD

4 Weeks post op 1st Eye back on Weekly basis for 3-5 Adjustments (Avg 4)

First 3-4 visits adjustments, Last visit is Lock In

Adjustment Method for Custom Distance

Initial surgical outcomes target hyperopic outcome of +0.75

1st adjustment takes patient from +0.75 to +0.25

Initial treatment of +0.50 of hyperopia gives EDOF into the lens.

"First we give you distance vision than the next adjustments we give you Near"

2nd Adjustment patient directs if you keep distance or add more near.

"How is your distance vision, computer vision, and distance vision?"

"We always take from the distance to add to the near!!"

Adjustment Method for Presbyopia

Initial surgical outcomes target hyperopic outcome

Dist eye target +0.75 ------ 1st adjustment target for +0.25

Near eye target +0.00-------- 1st adjustment targets for -0.75

Initial treatment of +0.50 of hyperopia gives EDOF into the lens.

"First we give you distance vision than the next adjustments we give you Near"

2nd Adjustment patient directs to add more near, stay the same, or push distance

"How is your near vision, computer vision, and distance vision?"

"We always take from the distance to add to the near!!!"

Medication Schedule

Antibiotic- tid x 1 week

Steroid- tid x 3 weeks and qd until adjustments completed

NSAID- qd until all adjustments completed

Late Adjustments

If patients desire to adjust distance or near eye

A “Late Adjustment” can be performed after 3-6 months post op

Corneal surgery (Lasik) or piggyback IOL

Very rare

Relieves patient’s anxiety about IOL being “LOCKED IN”

Summary

Light Adjustable Lens is the most accurate IOL in the world

Moving away from ”20/Happy” to ”20/Perfect”

Corrects distance and near vision

Best option for Post Refractive IOL

Thank You!!

About me…

- Dr. Fazio is a board certified optometrist and the Medical Director of Primary Eye Care at Newsom Eye.
  - Dr. Fazio manages Newsom Eye’s accredited one year Residency Program with Salus University.
  - Specializes in ocular disease diagnosis and treatment, dry eye, surgical co-management
  - (over 50,000 cases of cataracts and LASIK)
- EDUCATION
  - Residency Training in Primary Eye Care & Ocular Disease, PCO, PA
  - Doctor of Optometry, University of Waterloo, Canada
  - Honors Bachelor of Science, University of Waterloo, Canada
- NOTEWORTHY ACCOMPLISHMENTS
  - Sub-Investigator of Restor 3.0 Toric post-FDA study (ongoing)
  - Sub-Investigator of CXL epi-on
  - Sub-Investigator for Segmented Bifocal Intraocular Lens, Lenstec, Inc (just approved)
  - Sub-Investigator for the Light Adjustable Lens, Calhoun Vision, Inc.
  - Assisted in the Development of the Newsom Bladeless Laser Cataract Technique
  - Published in multiple journals
- PROFESSIONAL ASSOCIATIONS
  - American Board of Optometry, Diplomate
  - American Optometric Association
  - Florida Optometric Association
  - Hillsborough Society of Optometrists Member and Past President

LAL Co-Management – What it Takes

- Dr. Newsom has laid out the data and the details of just how good the results can be for this technology
- But how do we get there as Ods co-managing?
- The work for this lens is definitely AFTER the surgery to get the results – NOT before.
- What do we need to know and do to be successful?
- We are going to go over everything you should do and know in pre and post-op care.

LAL Patient Selection

Identifying appropriate patients for LAL is key to ensuring high patient satisfaction

- Patients Wanting Best Quality Vision
- Toric Patients
- Precision Mono Vision
- Post-Refractive Corneas

Patients who may be candidates include those who are:

- Looking to optimize their vision and outcomes
- Able to make and keep the additional 2 to 4 appointments needed for optimal vision with the RxSight LAL
- Found to have preexisting corneal astigmatism of ≥ 0.75 diopters
- Able to comply with wearing UV protective glasses until final light treatment

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Preparing for LAL Surgery

- **Preoperative examination** is unchanged from conventional cataract surgery
- **Reduced dependence** on IOL calculation, although the more accurate the determination the greater range of postop adjustability
- **Lens selection/formula**
  - Use A-constant of 118.4
  - Must dilate well – >6.5 mm pupil
  - Target plano

+10.0 D to +30.0 D

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Light treatments

Light treatments are painless, non-invasive, and take approximately 90 seconds

LIGHT TREATMENT SCHEDULE

Initial Light Treatment	At least 17 days after surgery
Secondary Light Treatment	At least 3 days after initial light treatment
Additional Light Treatments (if required)	At least 3 days after each prior light treatment

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Uv protective glasses

At the end of surgery, LAL patients are provided with UV protective glasses to help protect the LAL from indoor and outdoor sources of UV light

Exposure to UV light, such as sunlight, can cause uncontrolled changes to the LAL

The patient must wear UV protective glasses during all waking hours, from the time of lens implantation until 24 hours after the final light treatment has been completed

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Interactive post-op process

- Refraction optimized after healing is complete and ocular media clear
- Patient selects preferred prescription
- First ever “patient trial” of final outcome

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Customizing Vision with the LDD

- **Make sure tear film is healthy!**
- **Perform excellent refractions**
- **Involve patient in visual outcomes**
- **LDD treatment scheduling**
  - Handled by a personal RC
  - All treatments are done by THN
  - ? Future for FL ODs to do these???

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LDD Targeting

- **LAL has negative spherical aberration**
- **LDD planning**
  - Approach from slightly hyperopic (patients get better each time)
  - If goal is plano, target +.25D or +.5D
- **Monovision example:**
  - Goal OD: Plano OS: -1.00D
  - Target OD: +.5D OD -.5D

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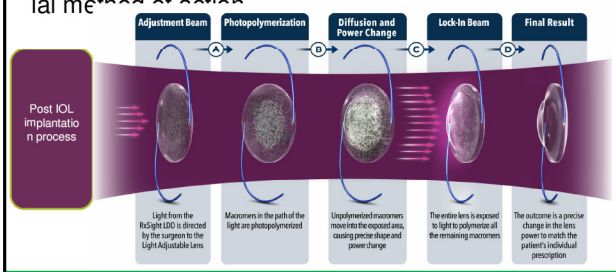
lal me[illegible]



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Precision monovision with the light adjustable lens

- **The LAL addresses the limitations of traditional monovision by:**
  - Reducing residual refractive error
    - Precision LAL adjustability
  - Reducing monovision intolerance
    - Adjustable and reversable via patient input
  - Negative SA (LAL and LDD) extends depth of focus to blend near and intermediate UCVA

	Monovision	Trifocal	LAL
Pros	• Good distance and intermediate (or near) UCVA • Low rate of dysphotopsias	• Good distance, intermediate, and near UCVA	• Good distance, intermediate, and near UCVA • Low rate of dysphotopsias
Cons	• Residual refractive error • Intolerance to monovision • Limited UCVA at near or intermediate (depending on target)	• Dysphotopsias • Residual refractive error	• Post-operative UV spectacles • Additional post-operative visits

All while preserving the visual quality of a monofocal lens!

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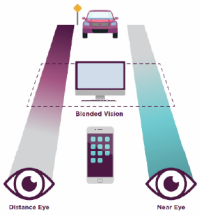
LAL Blended VISION Process

- **LAL Surgery**
  - Use 118.4 A constant to deliver +0.50 D OU
  - LAL's baseline negative SA leaves most patients with slightly broadened defocus curve
- **Light Treatments with LDD**
  - Target emmetropia in distance eye
  - Myopic target in near eye doubles the baseline negative SA value (via LDD)
  - Final target refractions are guided by patient interaction



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Refractive Accuracy (24 LAL eyes)

❖67% (16/24) of eyes are within 0.25D of the target MRSE of plano at 1 week post-lock-in.

❖100% (24/24) of eyes are within 0.50D of the target MRSE of plano at 1 week post-lock-in.

Caution: Investigational device. Limited by Federal Law to investigational use.

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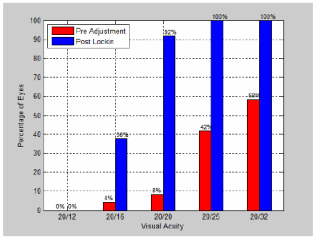
UCVA:

Pre-Adjustment vs 1 Week Post Lock-In n=24



After lock-in, 93% (22/24) of eyes achieved an UCVA of 20/20 or better.

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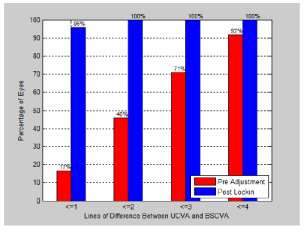
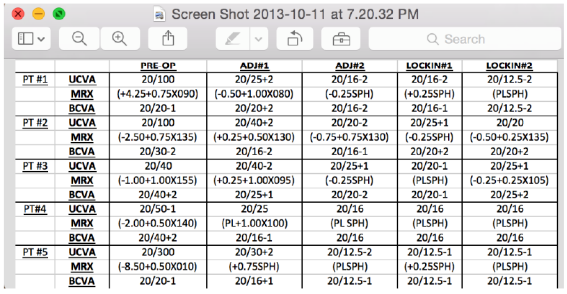
BSCVA vs UCVA

Pre-Adjustment vs 1 Week Post Lock-In n=24



All but one eye (96%) achieved ≤ 1 line of difference between their UCVA and BSCVA



		PRE-OP	ADJ#1	ADJ#2	LOCKIN#1	LOCKIN#2
PT #1	UCVA	20/100	20/25+2	20/16-2	20/16-2	20/12.5-2
	MRX	(+4.25+0.75X090)	(-0.50+1.00X080)	(-0.25SPH)	(+0.25SPH)	(PLSPH)
	BCVA	20/20-1	20/20+2	20/16-2	20/16-1	20/12.5-2
PT #2	UCVA	20/100	20/40+2	20/20-2	20/25+1	20/20
	MRX	(-2.50+0.75X135)	(+0.25+0.50X130)	(-0.75+0.75X130)	(-0.25SPH)	(-0.50+0.25X135)
	BCVA	20/30-2	20/16-2	20/16-1	20/20+2	20/20+2
PT #3	UCVA	20/40	20/40-2	20/25+1	20/20-1	20/25+1
	MRX	(-1.00+1.00X155)	(+0.25+1.00X095)	(-0.25SPH)	(PLSPH)	(-0.25+0.25X105)
	BCVA	20/40+2	20/25+1	20/20-2	20/20-1	20/25+2
PT#4	UCVA	20/50-1	20/25	20/16	20/16	20/16
	MRX	(-2.00+0.50X140)	(PL+1.00X100)	(PL SPH)	(PLSPH)	(PLSPH)
	BCVA	20/40+2	20/16-1	20/16	20/16	20/16
PT #5	UCVA	20/300	20/30+2	20/12.5-2	20/12.5-1	20/12.5-1
	MRX	(-8.50+0.50X010)	(+0.75SPH)	(PLSPH)	(+0.25SPH)	(PLSPH)
	BCVA	20/20-1	20/16+1	20/12.5-1	20/12.5-1	20/12.5-1

Toric vs LAL

	Pre OP	Adjustment 1	Adjustment 2	1 wk PO Lock in 2	6 Month PO
MRX	1.25 + 1.75 X 005	0.75 + 1.00 X 160	-0.25 + 0.50 X 120	-0.25 + 0.25 X 120	-0.25
Keratometry	44.25@150 / 43.00 @060	44.50@165 / 43.50@075	N/A	44.50 @ 165 / 43.50 @ 075	44.75 @ 165 / 43.75 @ 075
UCVA	20/200	20/40+2	20/16+1	20/20+2	20/16
BCVA	20/20-1	20/16	20/12.5-2	20/16-2	20/16+1

In Conclusion

Reduces post op refractive error / astigmatism

Reduces glare and halos

Successfully works in monovision

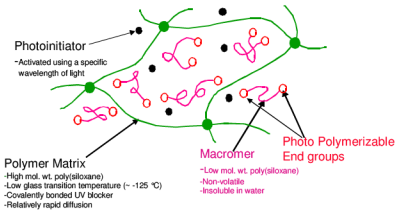
Reduces dependence on preop testing

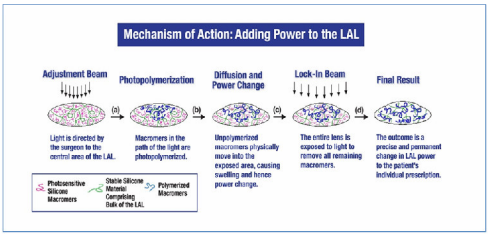
True Custom IOL for each patient

Learn that small refractive errors matter

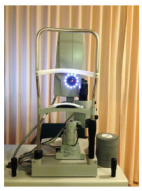
Results based -Truly the next revolutionary change in cataract surgery!!

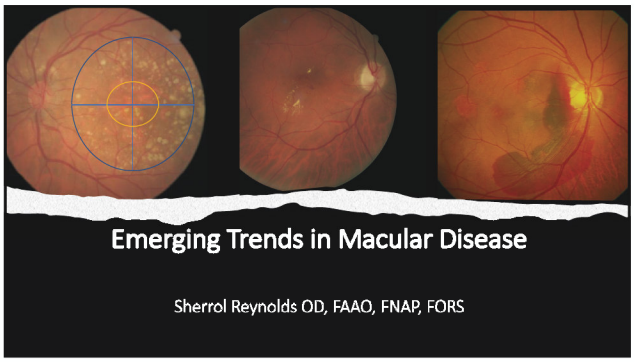
Description of Technology: LAL Composition



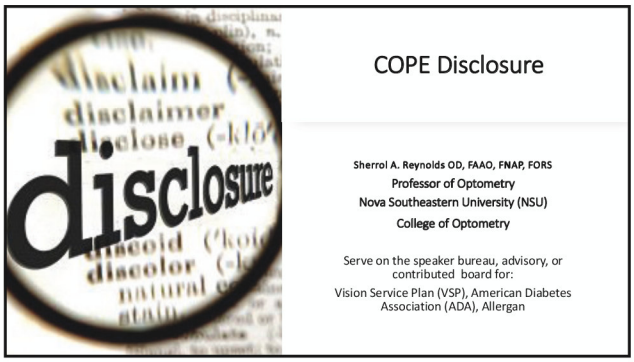


Light Delivery Device

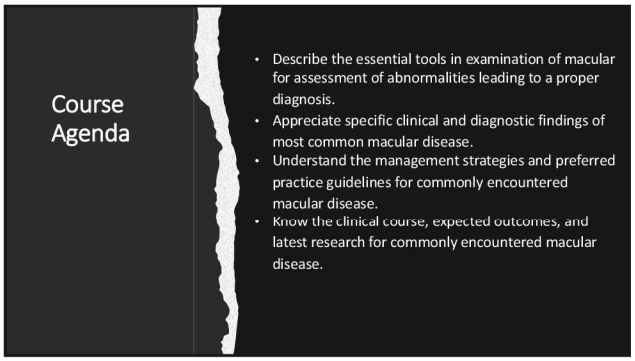



Emerging Trends in Macular Disease
Sherrol Reynolds OD, FAAO, FNAP, FORS

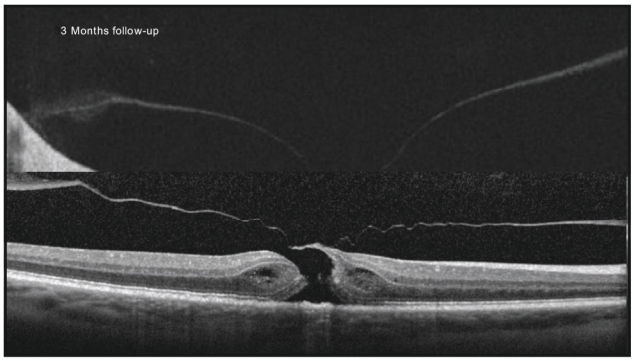
1


disclosure
COPE Disclosure
Sherrol A. Reynolds OD, FAAO, FNAP, FORS
Professor of Optometry
Nova Southeastern University (NSU)
College of Optometry
Serve on the speaker bureau, advisory, or contributed board for:
Vision Service Plan (VSP), American Diabetes Association (ADA), Allergan

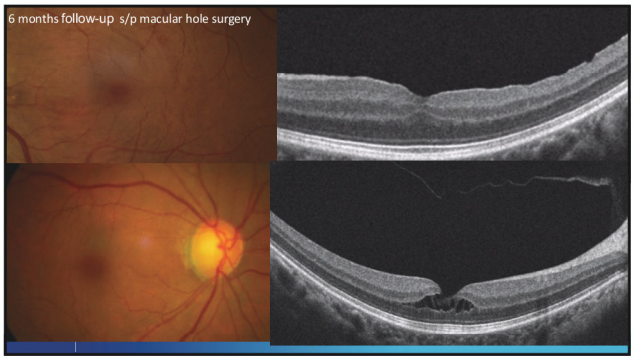
2


Course Agenda
Describe the essential tools in examination of macular for assessment of abnormalities leading to a proper diagnosis.
Appreciate specific clinical and diagnostic findings of most common macular disease.
Understand the management strategies and preferred practice guidelines for commonly encountered macular disease.
Know the clinical course, expected outcomes, and latest research for commonly encountered macular disease.

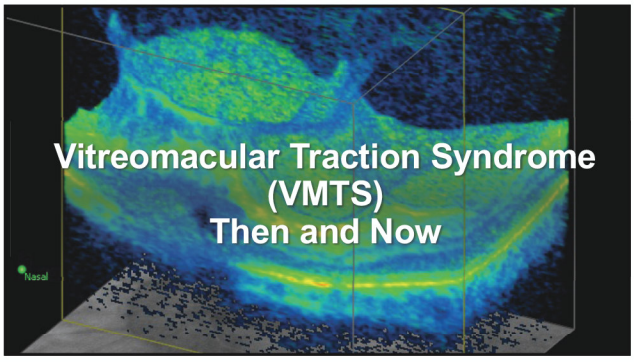
3


3 Months follow-up

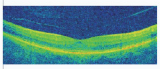
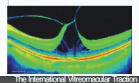
4


6 months follow-up s/p macular hole surgery

5


Vitreomacular Traction Syndrome (VMTS)
Then and Now
Nasal

6

Entity	OCT-based definition	Additional features	Symptom	Corresponds to full thickness macular hole (FTMH) stage:
Vitreomacular adhesion (VMA)	The following must be present on at least one OCT B-scan image: (i) Partial vitreous detachment as indicated by elevation of cortical vitreous above the retinal surface in the perifoveal area (ii) Persistent vitreous attachment to the macula within a 3-mm radius from the center of the fovea (iii) Acute angle between posterior hyaloid and inner retinal surface (iv) Absence of changes in foveal contour or retinal morphology		None	Staae 0 (Other eve should have full thickness macular hole)
Vitreomacular traction (VMT)	The following must be present on at least one OCT B-scan image: (i) Partial vitreous detachment as indicated by elevation of cortical vitreous above the retinal surface in the perifoveal area (ii) Persistent vitreous attachment to the macula within a 3-mm radius from the center of the fovea (iii) Acute angle between posterior hyaloid and inner retinal surface (iv) Presence of changes in foveal contour or retinal morphology (distortion of foveal surface, intraretinal structural changes such as pseudocyst formation, elevation of fovea from the retinal pigment epithelium (RPE), or a combination of any of these three features) (v) Absence of full thickness interruption of all retinal layers	Foveal pseudocyst, macular thickening, retinal capillary leakage (typically isolated VMT alone does not cause leak on fluorescein angiography), macular schisis, cystoid macular edema, retinal detachment 	Reduced or distorted vision	Stage 1 (VMT only, i.e. impending macular hole) OR Stage 2 (VMT with small/medium FTMH) OR Stage 3* (VMT with medium/large FTMH)

The International Vitreomacular Traction Study Group Classification of Vitreomacular Adhesion, Traction, and Macular Hole. Ophthalmology. 2013;120(12):2611–2619

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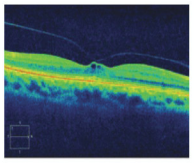
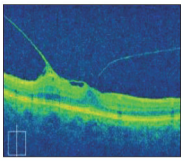
Vitreomacular Traction Study (IVTS) Group (Duker, 2013)

Vitreomacular adhesion (VMA)	(i) Focal: Width of attachment ≤1500 µm (ii) Broad: Width of attachment >1500 µm (i) Concurrent: Associated with other macular abnormalities (e.g. age-related macular degeneration, retinal vein occlusion, diabetic macular edema) (ii) Isolated: Not associated with other macular abnormalities
Vitreomacular traction (VMT)	(i) Focal: Width of attachment ≤1500 µm (ii) Broad: Width of attachment >1500 µm (i) Concurrent: Associated with other macular abnormalities (e.g. age-related macular degeneration, retinal vein occlusion, diabetic macular edema) (ii) Isolated: Not associated with other macular abnormalities



Focal VMT or V shaped



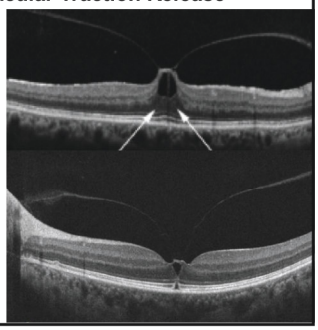
J-shaped VMT

Ophthamology.2013 Dec;120(12): 2611-9

8

Predictors of Vitreomacular Traction Release

- VMT- Classified by the degree of **inner-only** versus **both inner and outer** retinal involvement
- Spontaneous resolution
- **10–32% of VMT with only inner retinal distortion are more likely to have spontaneous resolution of traction compared with those who had both inner and outer retinal distortions.**

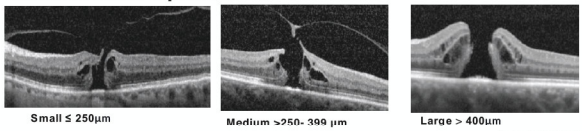


Clinical course of vitreomacular traction managed initially by observation. Ophthalmic Surg Lasers Imaging Retina.2013 46(5):571–576

9

VMT/ Macular Hole

Macular Hole: Updated Classification

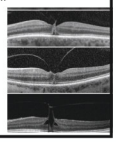


Small ≤ 250µm

Medium >250- 399 µm

Large > 400µm

Cause -- primary or secondary/ Presence of absence of VMT



The International Vitreomacular Traction Study Group Classification of Vitreomacular Adhesion, Traction, and Macular Hole. Ophthalmology. 2013;120(12):

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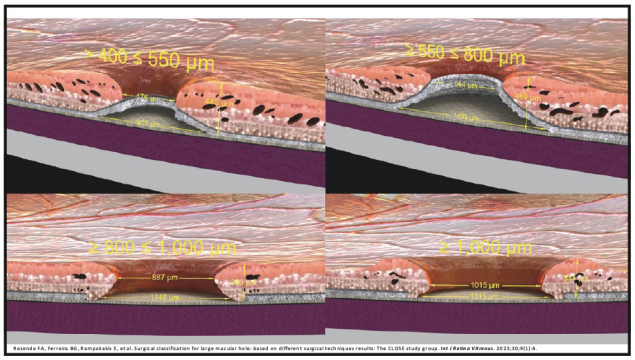
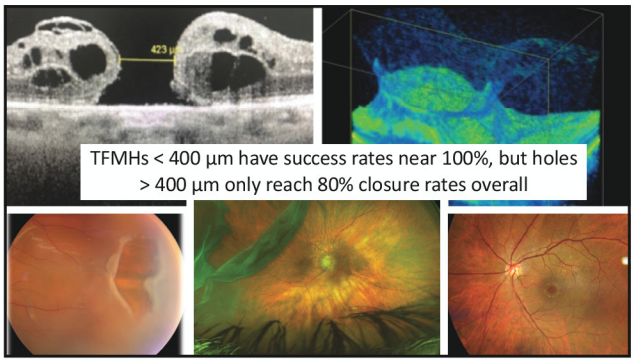


Rezende FA, Ferreira BG, Rampakakis E, et al. Surgical classification for large macular hole: based on different surgical techniques results: The CLOSE study group. Int J Retina Vitreous. 2023;30;9(1):4.

11

TABLE 3. MEAN BCVA GAINS BASED ON SURGICAL TECHNIQUE (LOGMAR)				
Surgical Technique	Large	X-Large	XX-Large	Giant
ILM Peeling	-0.5293	-0.4248	-0.3858	NA
ILM Flap	-0.3602	-0.3778	-0.2338	-0.2694
Macular Hydrodissection	NA	-0.4748	-0.3441	-0.5664
Human Amniotic Membrane	-0.4902	-0.5177	-0.5342	-0.3497
Autologous Retinal Transplantation	0.2202	-0.3561	-0.4633	-0.4178
NA- not enough numbers available				

12



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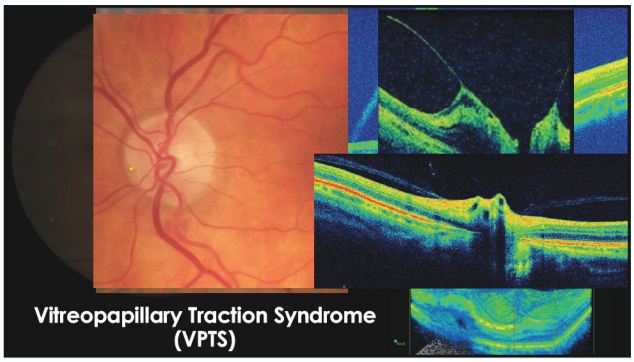

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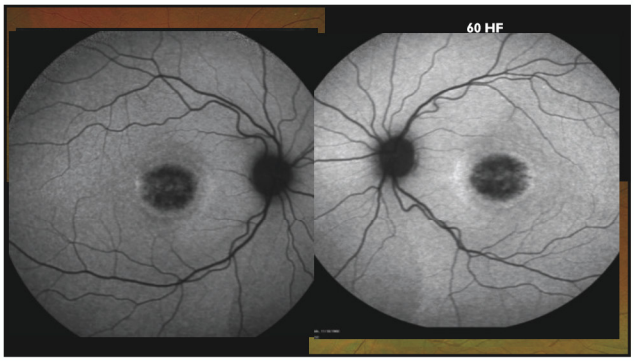

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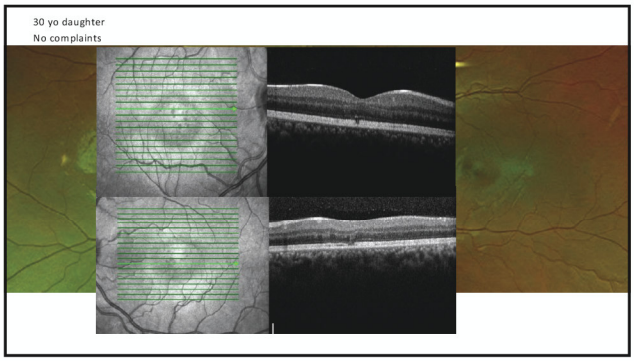

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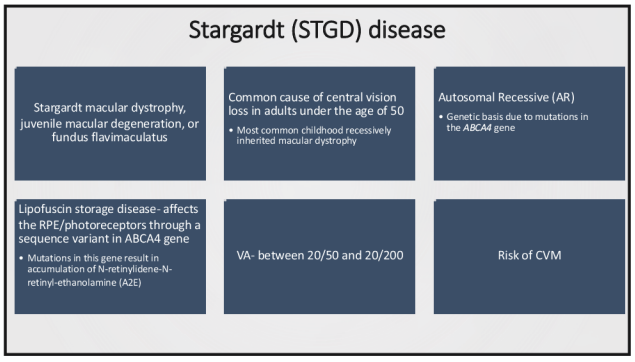

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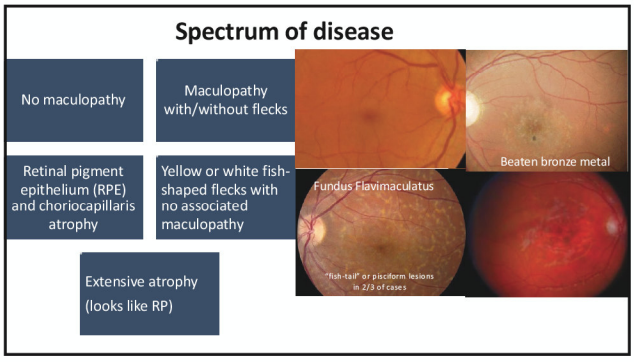

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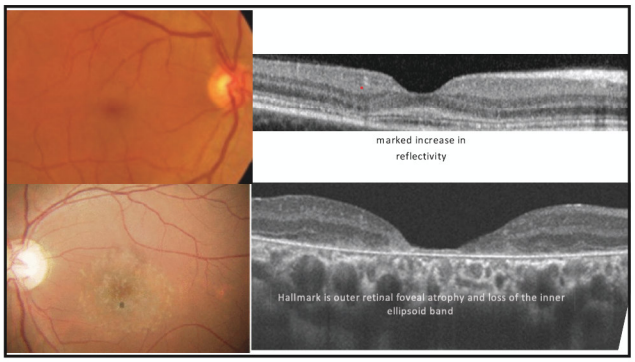

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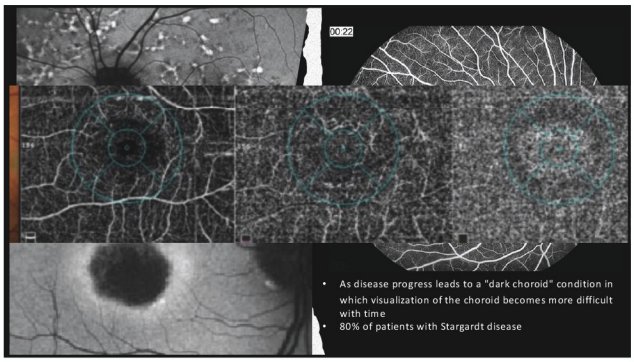

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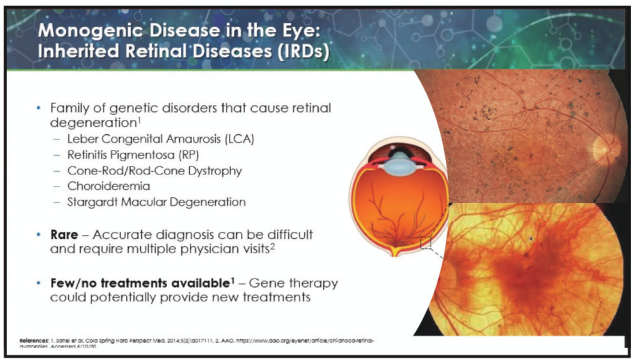

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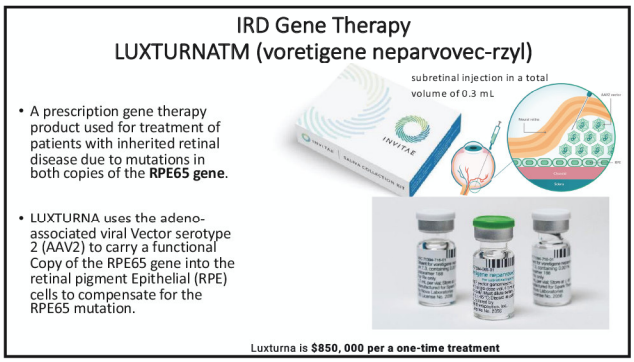

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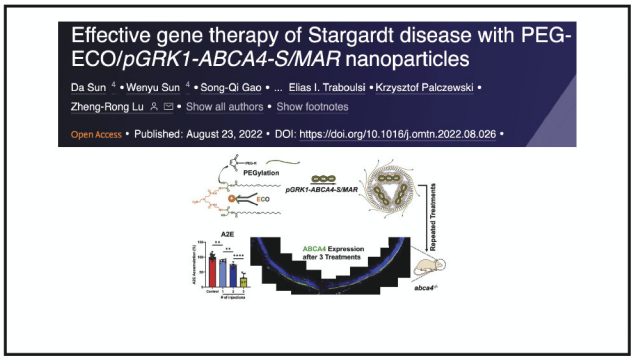

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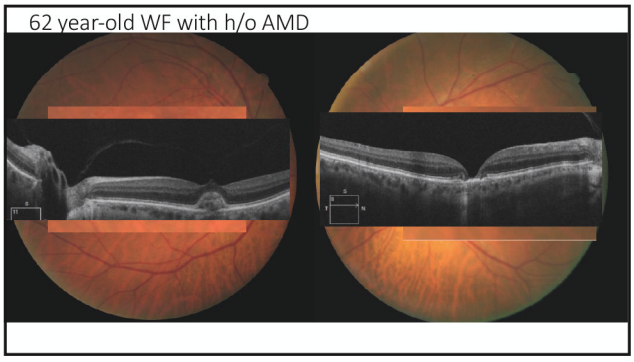

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Adult-onset Macular Vitelliform Dystrophy (AVMD)

- Adult-onset foveovitelliform macular dystrophy (AFVD)
- Autosomal dominant (AD) disease
- Bilateral vitelliform (egg-like) lesions in the macula
  - closely resembles Best's disease
  - **Bestrophinopathies**
- *BEST1* mutation/ PRPH2
  - Lipofuscin deposits in the RPE layer
- Abnormal electrooculogram (EOG)
- Risk of CVM

25

Clinical Stage

Stage I
- Previtelliform: normal or subtle RPE changes (central honeycomb changes). Normal vision

Stage II
- Vitelliform: classic "egg-yolk" lesion

Stage III
- Pseudohypopyon: Layering of lipofuscin

Stage IV
- Vitelleruptive: scramble egg appearance

Stage V
- Atrophic: RPE atrophy 20/30-20/200

Stage VI
- CNV: 20% of patients. 20/200 or worse

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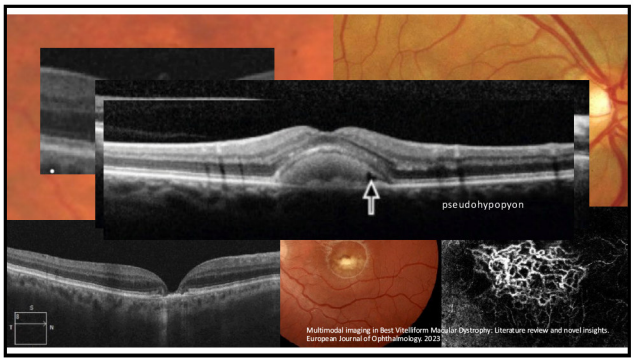

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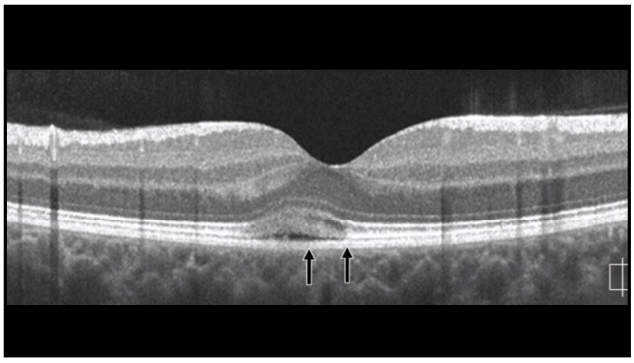

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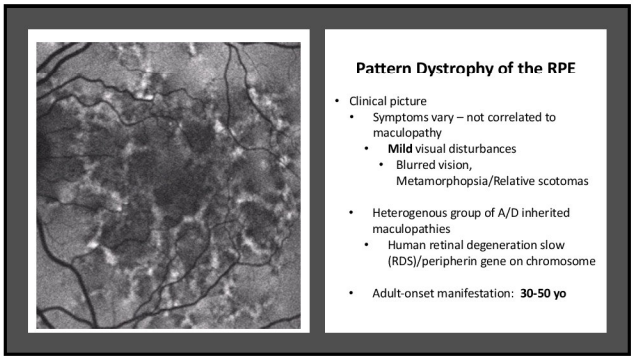

Pattern Dystrophy of the RPE

- Clinical picture
  - Symptoms vary – not correlated to maculopathy
    - **Mild** visual disturbances
      - Blurred vision, Metamorphopsia/Relative scotomas
  - Heterogenous group of A/D inherited maculopathies
    - Human retinal degeneration slow (RDS)/peripherin gene on chromosome
  - Adult-onset manifestation: **30-50 yo**

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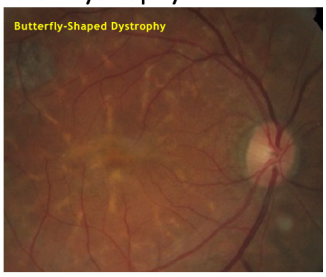
Pattern Macular Dystrophy

Butterfly- shaped pigment dystrophy

Reticular dystrophy of the RPE

Multifocal pattern dystrophy
- simulating fundus flavimaculatus



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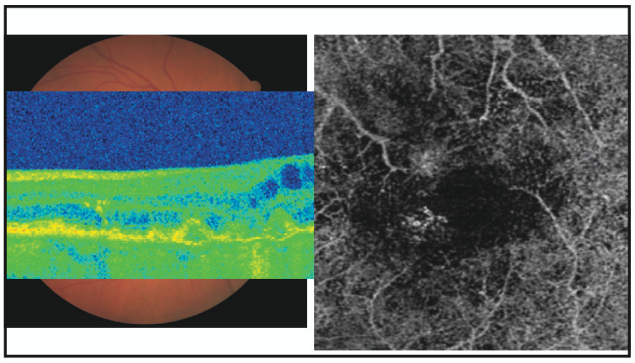

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Prevalence of Age-Related Macular Degeneration (AMD) 2024

- AMD affects ~20 million American
- 2 million Americans have Advanced AMD
  - Increase to >5 million by 2050
- 8 million Americans have Intermediate AMD
- 8 million have Geographic Atrophy (GA)

Rein DB, Wittenborn JS, Burke-Conte Z, et al. Prevalence of age-related macular degeneration in the US in 2019. JAMA Ophthalmol. November 3, 2022

The Pathophysiology of Geographic Atrophy Secondary to Age-Related Macular Degeneration and the Complement Pathway as a Therapeutic Target. Retina. 2017;37(5):819-835

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AMD – Risk Factors

Non-Modifiable

- **Older-age**
- Gender
  - Women are 1.3 times at greater risk for AMD
- Caucasian
- Light iris >darker
  - 2X greater risk
- AMD in the fellow-eye
- **Genetic predisposition (eg, family history of AMD)**
  - Genetic differences account for ~ 55% of total variability in disease risk.

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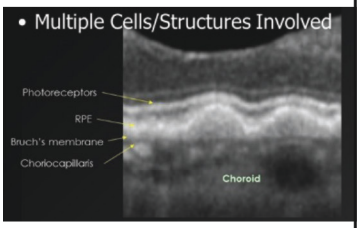
AMD Pathogenesis

- Oxidative stress to the retinal pigment epithelium (RPE)
- Reduced mitochondrial function
- Chronic low-grade inflammation of the retina
- Angiogenesis cascade
- Stress-induced cell death



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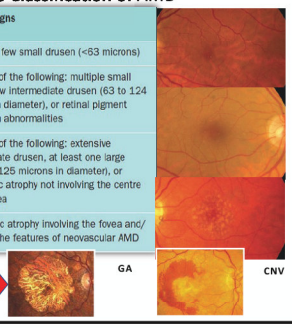
AREDS Classification of AMD

Classification	AREDS Category	Clinical signs
No AMD	1	None or a few small drusen (<63 microns)
Early AMD	2	Any or all of the following: multiple small drusen, few intermediate drusen (63 to 124 microns in diameter), or retinal pigment epithelium abnormalities
Intermediate AMD	3	Any or all of the following: extensive intermediate drusen, at least one large drusen (≥125 microns in diameter), or geographic atrophy not involving the centre of the fovea
Advanced AMD	4	Geographic atrophy involving the fovea and/or any of the features of neovascular AMD



Age-Related Study Disease Study Research Group. Arch Ophthalmol. 2005;123(11):1570-1574

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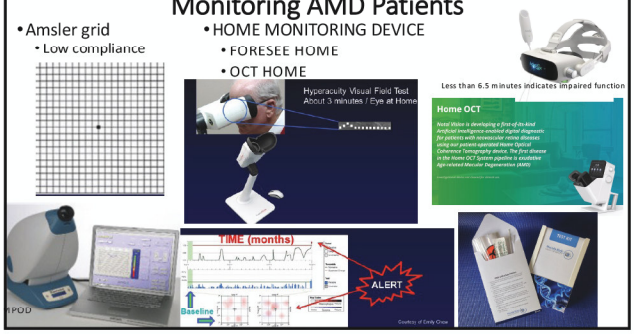
Monitoring AMD Patients

- Amsler grid
  - Low compliance
- HOME MONITORING DEVICE
  - FORESEE HOME
  - OCT HOME



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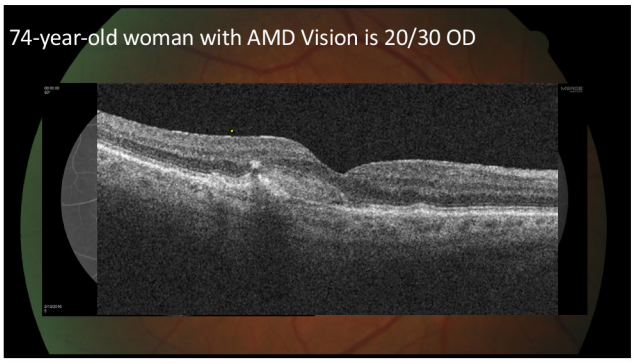

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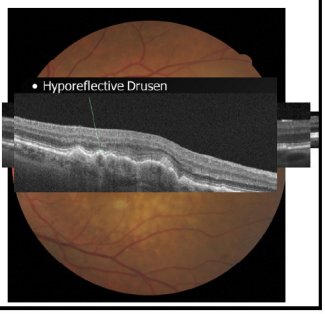
SD-OCT: AMD High Risk Features

- Loss of RPE integrity
- Disruption of Photoreceptor
- Intraretinal Hyper-reflective foci overlying druse (pigment migration)
- Hypo-reflective foci within druse ('softening of drusen)



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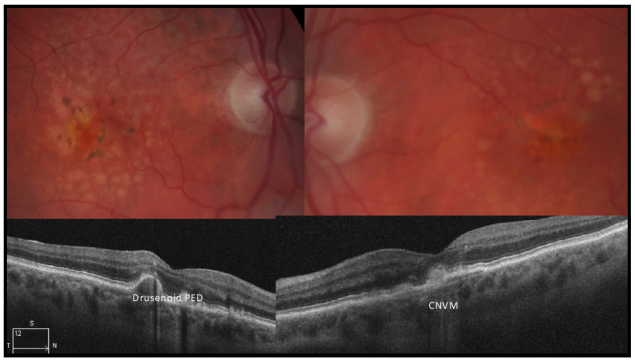

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Current ARMD TreatmentOptions

- Photodynamic therapy – used Rarely – PCV, chronic leaking growing lesions with scars
- Macugen – used "maybe never" very ineffective but still available
- Avastin – used with step therapy and for cost reasons
- Lucentis
- Eylea
- Beovu – used rarely – unresponsive CNV
- Vabysmo - increasing usage due to improved duration and efficacy
- Susvimo –rarely used – new technology – few trained surgeons
- Biosimilar Lucentis – usage will start soon and be dictated by insurance

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Latest Treatment

Anti-Vegf Biosimilars

- "A biosimilar is a biological product that is approved based on data showing that it is highly similar to a biological product already approved by the FDA (reference product) and has no clinically meaningful differences in terms of safety, purity and potency (i.e., safety and effectiveness) from the reference product, in addition to meeting other criteria specified by law."
- Currently, 2 FDA approved Ranibizumab Biosimilars
  - Byooviz (Samsung) approved Sept 2021
  - Cimerli (Coherus) approved Oct 2022
- Many in development
  - Ranibizumab ≅ 5
  - Aflibercept ≅ 8
  - Bevacizumab ≅ 1 Outlook Pharmaceuticals (Lytenava)

High Dose Aflibercept (Eylea)

- PULSAR (AMD) and PHOTON (DME) Studies
  - Looked at 8 mg vs 2 mg of Eylea
  - Demonstrated non-inferior and clinically equivalent vision gains at 48 weeks with 8 mg at 12 and 16 week dosing after 3 initial doses compared to Eylea every 8 weeks after initial dosing
- Eylea HD FDA approved 8/18/2023 for AMD, DME and DR
  - Recommended dose 1 injection every 4 weeks for first 3 mos for all indications, then every 8-16 weeks (2-4 mos) for AMD and DME and every 8-12 weeks (2-3 mos) for DR

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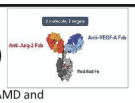
Vabysmo (faricimab)



- Roche/Genentech
  - FDA approved January 3, 2022 for AMD and DME
- First bi-phasic antibody for intraocular use
  - One arm: Vegf-A inhibitor
  - Other arm: Angiopoietin-2 (Ang-2)inhibitor
    - growth factor that promotes vascular destabilization and and inflammation
  - Dual inhibition of VEGF and Ang-2 have proven more effective than inhibiting either target alone
- Multiple studies show similar results to monthly Lucentis/Eylea but able to object less frequently, many pts q 16 weeks
- FDA approved for RVO

Susvimo

Previously called Genentech Port Delivery System (PDS)
- Refillable port placed under conjunctiva to allow steady supply of Lucentis

Studies (LADDER, ARCHWAY) demonstrated equivalent results to monthly Lucentis at 40 weeks
- Large % of pts did not need refill prior to 6 or 12 mos

FDA approved 10/1

Recalled 10/22
- Issue with implants breaking when refilled

May be available again late 2023/early 2024

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ARVO Annual Meeting Abstract | June 2021

The Results of the 10 Year Follow-on Study of the Age-Related Eye Disease Study 2 (AREDS2)

Emily Y Chew; Traci E Clemons; Tiarnan D L Keenan; Elvira Agron; Claire E Malley; Amitha Domalpally

Purpose : To assess the long-term effects of adding lutein/zeaxanthin and omega-3 fatty acids to the Age-Related Eye Disease Study (AREDS) supplements on age-related macular degeneration (AMD) progression and adverse side-effects.

Conclusion: The 10-year Follow-on study replicated the findings of the randomized clinical trial at 5 years. Lutein/zeaxanthin, when compared with beta-carotene, had an incremental beneficial effect on progression to late AMD. Beta-carotene doubled the risk of lung cancer, providing support for lutein/zeaxanthin as a replacement of beta-carotene in the AREDS2 supplements

Methods : The AREDS2 clinical trial randomly assigned participants with bilateral intermediate AMD or late AMD in one eye to lutein/zeaxanthin and/or omega-3 fatty acids or placebo. Secondary randomization also evaluated varying doses of beta-carotene (0 vs. 15 mg) and zinc (25 vs. 80 mg). At the end of the clinical trial, a follow-up study was conducted with 6-monthly telephone calls to the surviving AREDS2 participants from the central coordinating center to collect outcome data and adverse events for safety monitoring for an additional 5 years. Medical records were obtained from treating physicians to validate any self-reported diagnosis or treatment of late AMD and cataract and side-effects. AREDS2 supplements with lutein/zeaxanthin, vitamin C and E, and zinc plus copper were provided to all participants during this additional follow-up. Repeated measures logistic regression was used in the primary analyses.

Results : 6360 study eyes (3887 participants) were analyzed and 3047 (48%) progressed to late AMD. The main effects of lutein/zeaxanthin vs. no lutein-zeaxanthin and of omega 3 fatty acids vs. no omega 3 fatty acids resulted in hazard ratios of 0.91 (95% CI: 0.89-0.99) (p=0.03) and 1.00 (0.92-1.09) (p=0.91), respectively. When the lutein/zeaxanthin main effect analysis was restricted to those randomized secondarily to beta-carotene, the HR was 0.80 (0.69-92) (p=0.003). On direct analysis of lutein/zeaxanthin vs. beta-carotene, the HR was 0.85 (0.74-0.98) (p=0.026). For the comparisons of low vs. high zinc and no beta-carotene vs. beta-carotene, the HRs were 1.04 (p=0.48) and 1.04 (p=0.50), respectively. For those randomized to beta-carotene, the odds ratio (OR) of developing lung cancer was 1.92 (1.11-3.31)(p=0.02) while the OR for those randomized to lutein/zeaxanthin was 1.19 (0.82-1.73) (p=0.35).:

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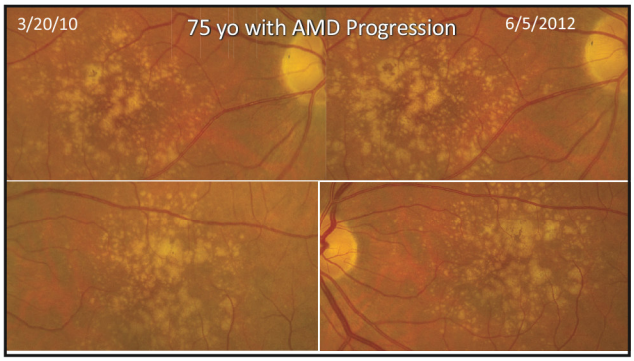

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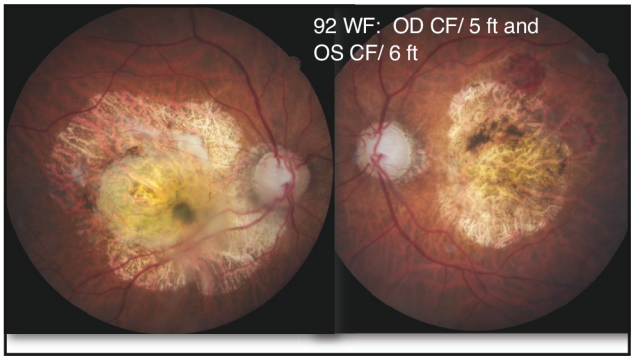

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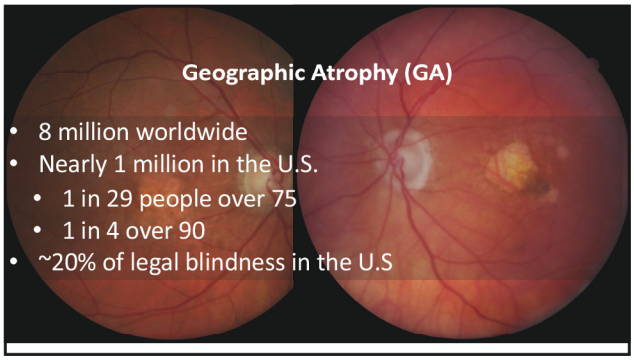

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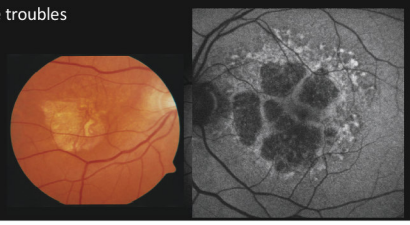
DRY AMD Geographic ATROPHY (GA) Progression

- Measure the atrophic area to check for progression
- Identification of peri-lesional abnormalities
- Hyper-FAF borders- Sick RPE
- Predict future troubles



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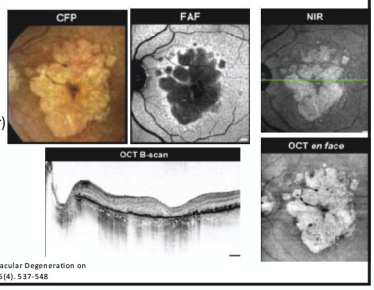
GA Progression- Classification of Atrophy Meeting (CAM)

- Color fundus photography (CFP)
- Fundus autofluorescence (FAF)
- Near-infrared reflectance (NIR)
- OCT
  - Cross sectional B-scan (line raster)
  - En-face

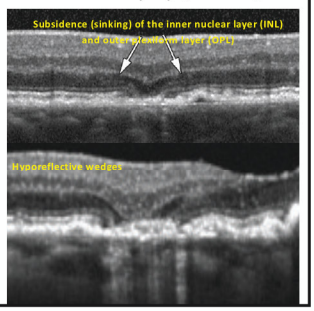


Consensus Definition for Atrophy Associated with Age-Related Macular Degeneration on OCT Classification of Atrophy Report 3. Ophthalmology. 2018. 125(4). 537-548

50

Incomplete RPE and Outer Retinal Atrophy (iRORA)

- "Impending GA"
- Subsidence of the OPL & INL and a hypo-reflective wedge
- Signal hypertransmission into the choroid with corresponding attenuation/disruption of the RPE



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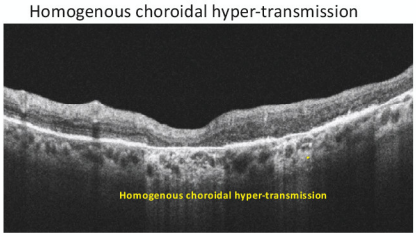
Complete RPE and Outer Retinal Atrophy (cRORA)

Absence of the RPE and photoreceptors
≥ 250µm in diameter
Homogenous choroidal hyper-transmission



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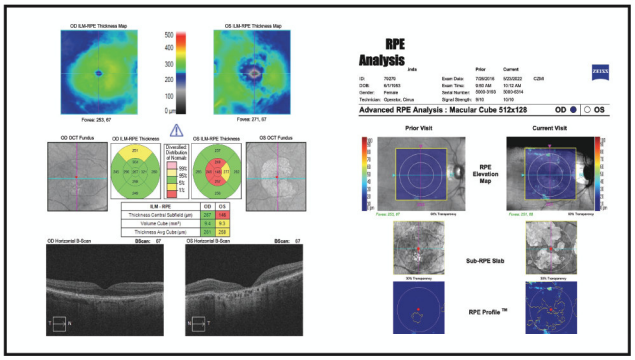

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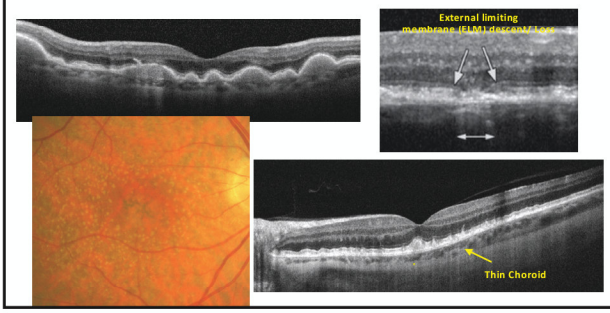
OCT Biomarker for GA Progression



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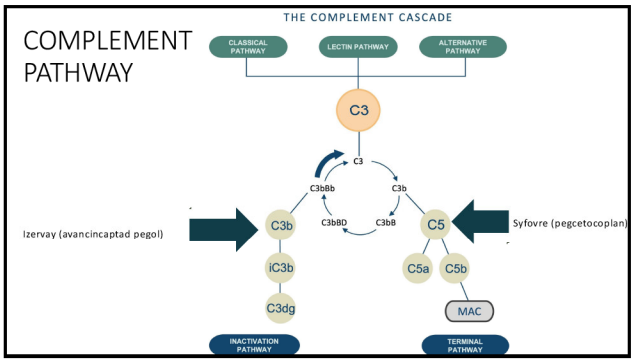

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Latest Treatment for Geographic Atrophy (GA)

Syfovre (pegcetocoplan)

- Apellis
- FDA approved Feb 17, 2023
  - One injection every 25 to 60 days
- Slows progression of GA lesions by blocking C3
  - OAKS Study: 22% qm, 18% qom
  - DERBY: 18% qm, 17% qom
  - Increasing effect with time
- Recent concern of vasculitis

Izervay (avancincaptad pegol)

- Iveric Bio
- FDA approved Aug 5, 2023
  - One injection per mos for up to 12 mos
- Slows progression of GA by blocking C5
  - GATHER1/GATHER 2 studies:
    - At 12 mos, 27% (2 mg) and 28% (4 mg) less GA growth
    - At 18 mos, 28% and 30%
    - Reduced rate of vision loss noted
    - Good safety profile

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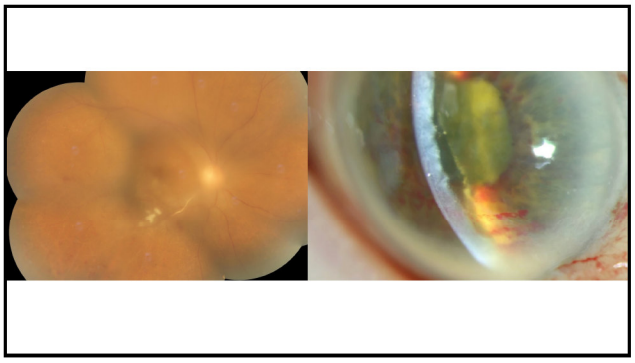

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Gene therapy in AMD: Promises and challenges

- Gene therapy are now being investigated for AMD
- Significant challenges remain, particularly with delivering the vector to the back of the eye
- Long-term benefit of gene therapies in AMD remains to be seen

Table. Investigative gene therapies for age-related macular degeneration

Therapy name (sponsor)	Vector	Indication	Study Phase	Mechanism of action	Delivery method
RGX-314 (RegenxBio)	AAV8	Neovascular AMD	I/IIa	Encodes an anti-VEGF Fab protein similar to ranibizumab.	Surgical subretinal injection
ADVM-22 (Adverum Biotechnologies)	AAV2	nAMD	I	Promotes production of aflibercept protein.	Intravitreal injection
AAV2-sFLT01 (Sanofi/ Genzyme)	AAV2	nAMD	I	Encodes sFLT-1 to neutralize vascular endothelial growth factor.	Intravitreal injection
AAVCAGsCD59 or HMR59 (Hemera Biosciences)	AAV2	nAMD and non-nAMD	I	Soluble form of CD59 to inhibit membrane attack complex formation.	Intravitreal injection
GT005 (Gyroscope Therapeutics)	AAV2	Non-nAMD	I/II	Targets complement cascade.	Surgical subretinal injection

Heier JS, Kherani S, Desai S, et al. Intravitreous injection of AAV2-sFLT01 in patients with advanced neovascular age-related macular degeneration: A phase 1, open-label trial. Lancet. 2017;390:50-61.
Rakoczy EP, Lai C-M, Magno AL, et al. Gene therapy with recombinant adeno-associated vectors for neovascular age-related macular degeneration: 1 year follow-up of a Phase 1 randomised clinical trial. Lancet. 2015;386:2395-2403.
Constable IJ, Lai C-M, Magno AL, et al. Gene therapy in neovascular age-related macular degeneration: Three-year follow-up of a phase 1 randomized dose escalation trial. Am J Ophthalmol. 2017;177:150-158.
Rakoczy EP, Magno AL, Lai C-M, et al. Three-year follow-up of Phase 1 and 2a rAAV.sFLT-1 subretinal gene therapy trials for exudative age-related macular degeneration. Am J Ophthalmol. 2019;204:113-123.
Grishanin R, Vuillemenot B, Sharma P, et al. Preclinical evaluation of ADVM-022, a novel gene therapy approach to treating wet age-related macular degeneration. Mol Ther. 2019;27:118-126.

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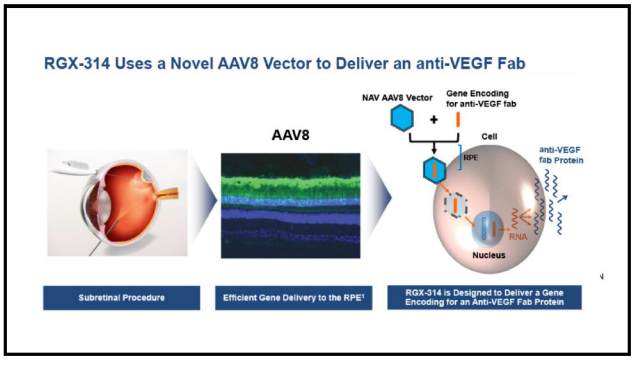

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> Int Ophthalmol Clin. 2024 Jan 1;64(1):21-33. doi: 10.1097/IIO.0000000000000510.
Epub 2023 Dec 28.

AMD and Stem Cell-Based Therapies

Joseph C Giacalone, David H Parkinson, Daniel A Balikov, Rajesh C Rao

PMID: 38148879 PMCID: PMC10783850 (available on 2025-01-01)
DOI: 10.1097/IIO.0000000000000510

Abstract

Age-related macular degeneration (AMD) is a prevalent and complex disease leading to severe vision loss. Stem cells offer promising prospects for AMD treatment as they can be differentiated into critical retinal cell types that could replace lost host retinal cells or provide trophic support to promote host retinal cell survival. However, challenges such as immune rejection, concerns regarding tumorigenicity, and genomic integrity must be addressed. Clinical trials with stem cell-derived retinal pigment epithelial cells have shown preliminary safety in treating dry AMD, but improvements in manufacturing and surgical techniques cell delivery are needed. Late-stage AMD poses additional hurdles, possibly requiring multi-layered grafts. Advancements in automation technologies and gene correction strategies show potential to enhance iPSC-based therapies. Stem cell-based treatments offer hope for AMD management, but further research and optimization are essential for successful clinical implementation.

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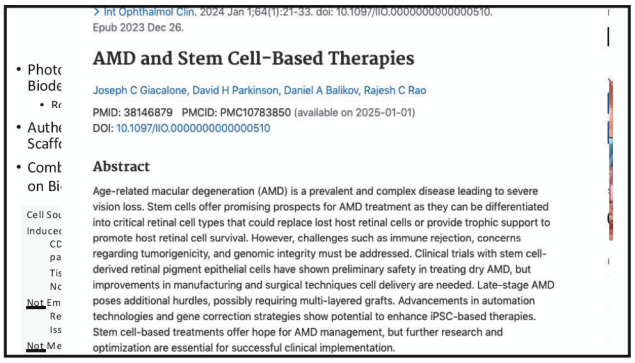

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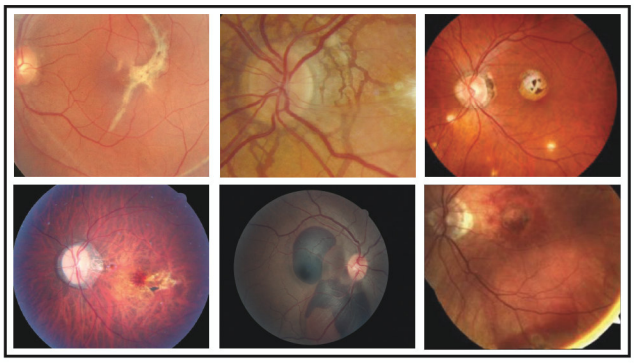

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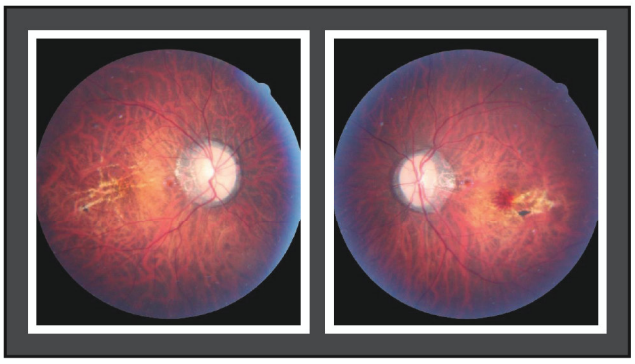

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Myopia 2024

Non-pathologic myopia

- Usually minimal to moderate (< 6.00 diopters)
- "high myopia"

Pathologic myopia

- (≥-6.00D)
- Axial length ≥26.5 mm
- Major cause of visual impairment worldwide
- 3% of the world's population
  - Highest prevalence in Asian populations
- A common cause of legal blindness in young individuals

Task Force on Myopia. Reducing the global burden of myopia by delaying the onset of myopia and reducing myopic progression in children: The Academy's Task Force on Myopia. *Ophthalmology*. 2021;128(6):816-826.

64

Nearly a 2-Fold Increase in 30 years

By 2050, about half of the world's population is predicted to be myopic

Prevalence of Myopia

Source: Németh, J., Tapasztó, B., Aclimandos, W. A., Kestelyn, P., Jonas, J. B., De Faber, J. T. H., ... & Resnikoff, S. (2021). Update and guidance on management of myopia. European Society of Ophthalmology in cooperation with International Myopia

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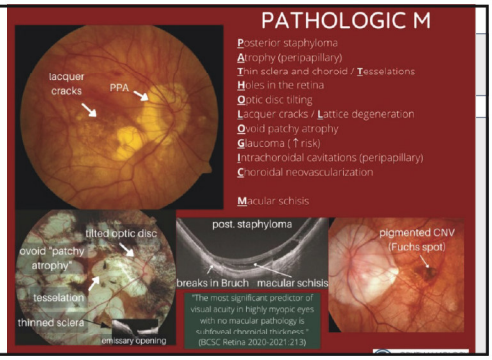
Risk Factors



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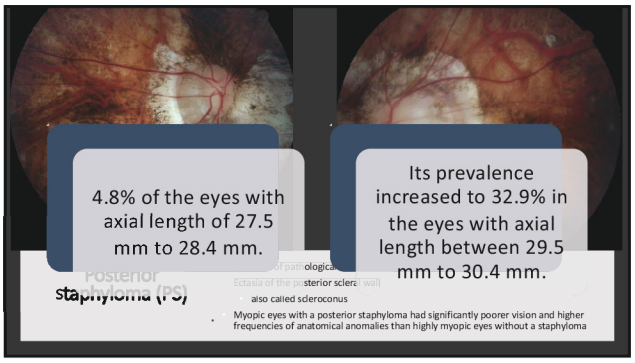

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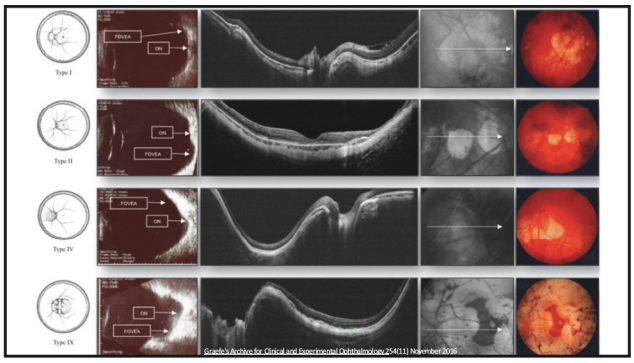

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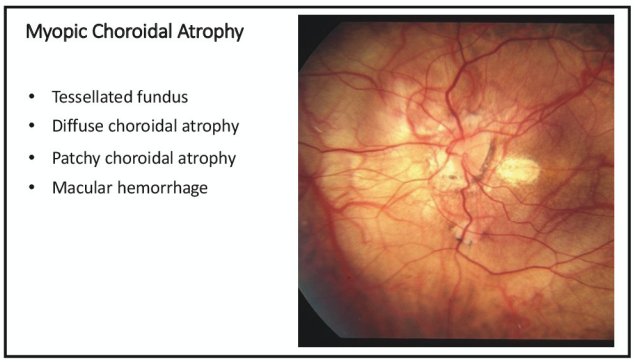

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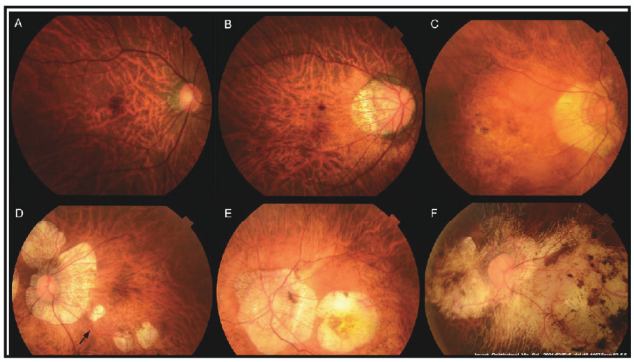

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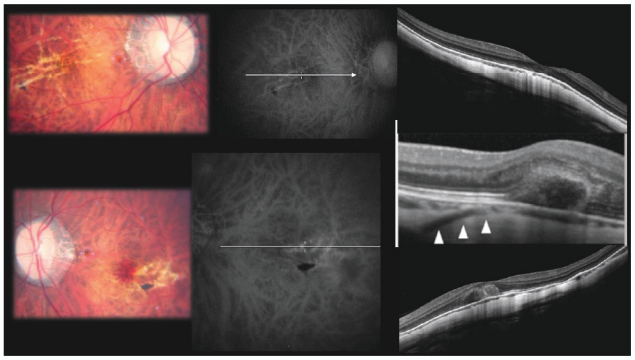

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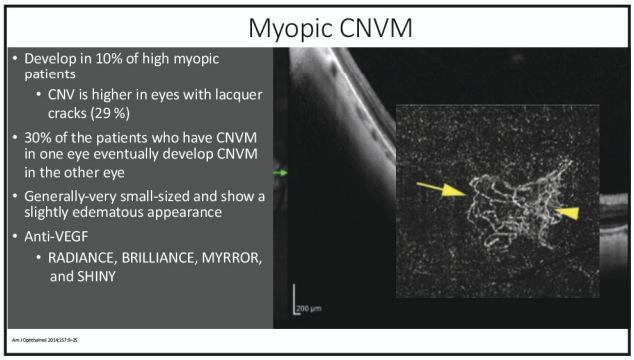

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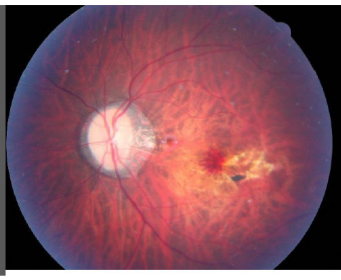
Myopic CNV

Three phases

- Active phase with proliferation of a fibrovascular membrane including CNV, exudation, and hemorrhage
- Scar phase exemplified by a Fuchs spot
- Atrophic phase



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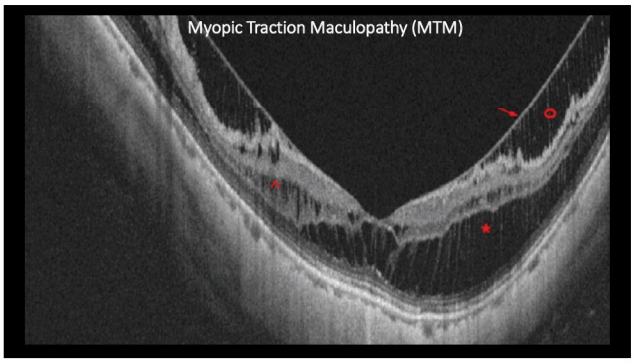

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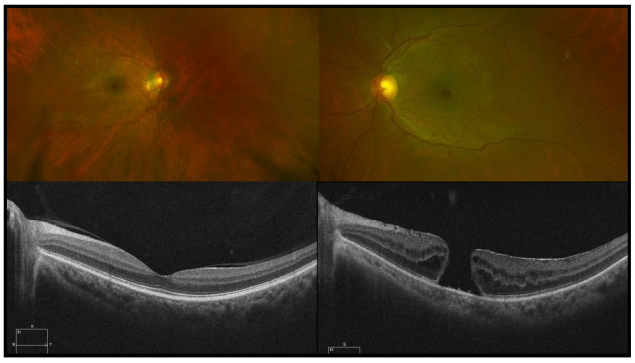

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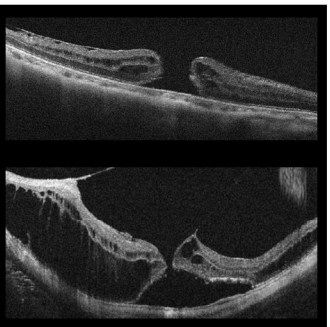
Myopic Macular hole

Two types of macular holes in highly myopic eye

1. One is the type with the edge of the hole thickened with retinal cysts

2. Myopic foveoschisis



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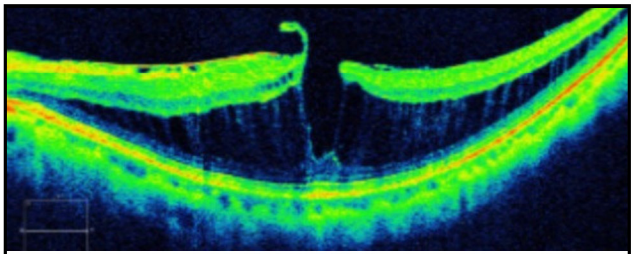

Myopic foveoschisis

- Myopic macularschisis
- Vitreoretinal interface (VRI) traction
- First described by Takano and Kishi in 1999
- Splitting in the inner nuclear layer and outer plexiform layer

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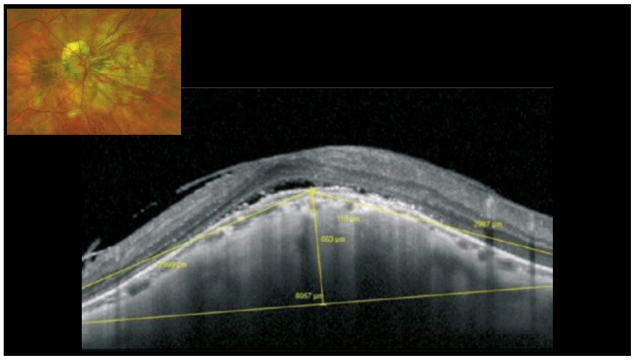

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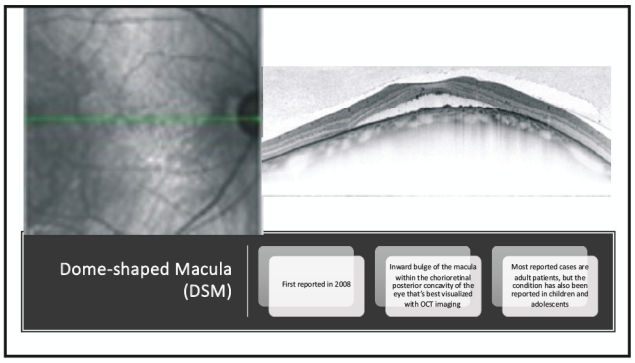

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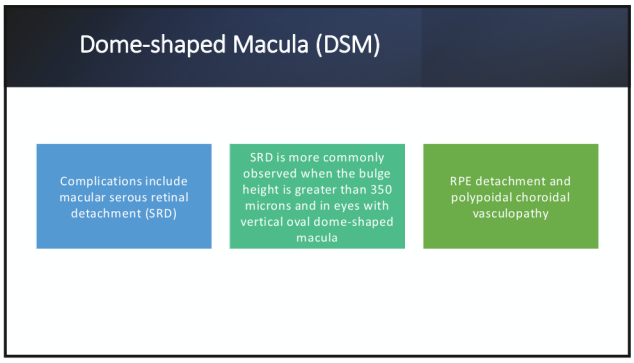

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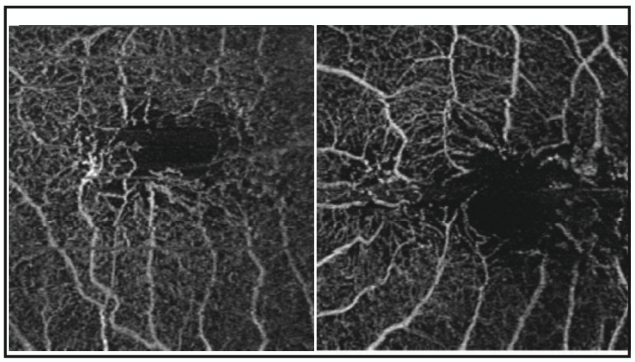

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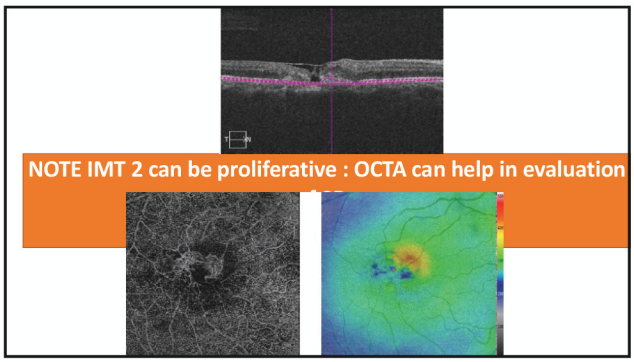


82

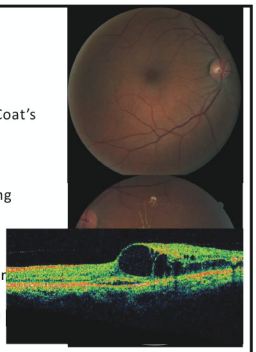
Macular Telangiectasia

- Poorly Understood Degenerative Retinal Disorder
- Chronic, usually Slowly Progressive Neurodegeneration
  - Perifoveal Capillary Abnormalities
    - Vascular inflammation and capillary alteration
  - Loss of outer nuclear and ellipsoid zone
  - Cystic cavitation-like changes resulting in macular thinning and macular hole formation
    - Atrophic changes start in the outer retina leading to intraretinal loss formation of partial or full-thickness macular holes differ from VM interface
  - May result in the choroidal neovascular formation
- Risk Factors
  - Genetic
  - Association with Diabetes, HTN, Obesity

83

Macular Telangiectasia

- Subtypes
  - Type 1
    - Congenital, Unilateral, maybe a variant of Coat's Disease (Developmental Anomaly)
  - Type 2 (AKA Mac Tel type 2)
    - Most common, bilateral
    - Genetic- Reported cases in families including identical twins
    - Age: 30-60
  - Type 3
    - Rare and poorly understood retinal vascular disorder
- DDX: RVO, DR, Radiation Retinopathy, AMD nAMD



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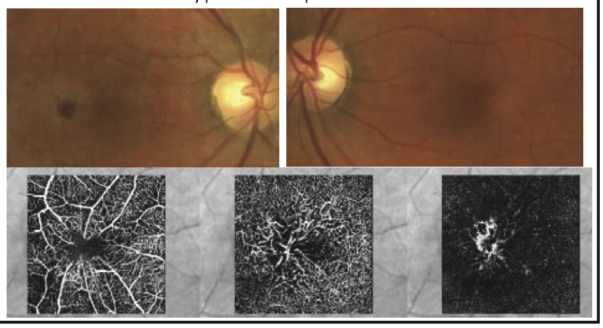
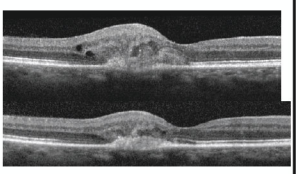
MacTel type 2 Complications



85

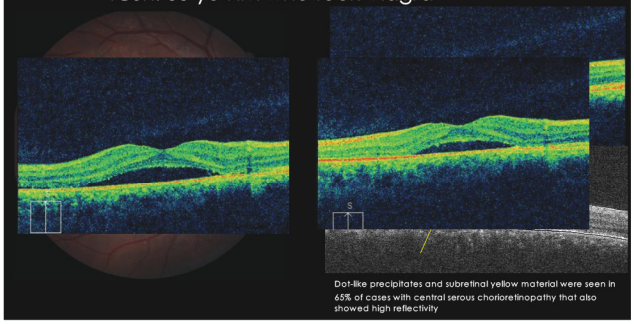
Management and Prognosis

- Focal laser and PDT (Type 1)
- Steroid Injections
  - Reduce Inflammation and Fluid but does not reverse outer retinal loss
- Anti-VEGF
  - For CNVM
  - Improves fluid but does not reverse outer-retinal loss
- Ciliary neurotrophic factor (CNTF)
  - Under Investigation



86

ICSR: 33 yo HM who took Viagra



Dot-like precipitates and subretinal yellow material were seen in 65% of cases with central serous chorioretinopathy that also showed high reflectivity

87

Central Serous Chorioretinopathy (CSCR)

Fourth most common retinopathy

Classification

- Acute
- Isolated or multifocal RPE or serous detachment(s)
- Bullous serous retinal detachment
- Chronic CSCR
  - Retinal pigment epithelium depigmentation

Etiology

- Type A personality-catecholamine release, which increases choroidal permeability
- Psychological stress and depression, sleep apnea, medications (steroids, MEK inhibitors, pseudoephedrine, Methylenedioxymethamphetamine (MDMA) or ecstasy, sildenafil), *H. pylori* infection, HTN, endocrine disorders

Recurrences

- Recurrence reported to be as high as 50%

Central serous chorioretinopathy. Ophthalmologica 2014; 232: 65–76

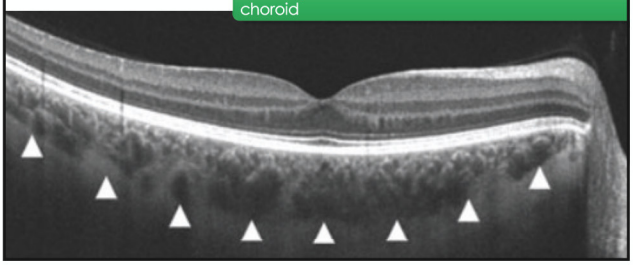
88

Choroidal Morphology

posterior pole

Typically, thickest beneath the fovea, where its average thickness is 320µm

The temporal choroid is thicker than the nasal choroid



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Pachychoroid Disease Spectrum (PDS)

Central Serous Chorioretinopathy (CSCR)	Pachychoroid Pigment Epitheliopathy (PPE)	Pachychoroid Neovasculopathy (PNV)	Polypoidal Choroidal Vasculopathy (PCV)
Peripapillary Pachychoroid Syndrome (PPS)	Focal Choroidal Excavation (FCE)	Peripapillary Pachychoroid Neovasculopathy	Peripheral Exudative Hemorrhagic Chorioretinopathy

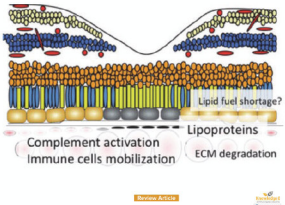
B Brown R, Mohan S, Chhablani J. Pachychoroid Spectrum Disorders: An Updated Review. J Ophthalmic Vis Res. 2023 Apr 19;18(2):212-229.

90

Pachychoroid Disease Spectrum (PDS)

Pachychoroid = thicken choroid

- Abnormal and permanent increase in choroidal thickness
  - (choroidal thickness of >320 µm)
- Larger Haller layer vessels (**Pachyvessels**) and medium vessels of Sattler layer & choriocapillaris present or effaced (atrophy)
- Reduced fundus tessellation- thinning of the overlying inner choroid
- Retinal pigment epithelium (RPE) abnormalities
- Choroidal vascular hyperpermeability (CVH)
- A lack of soft-drusen (an exception is made for pachydrusen, which are irregular, scattered yellow–white deposits across the posterior pole)



B Brown R, Mohan S, Chhablani J. Pachychoroid Spectrum Disorders: An Updated Review. J Ophthalmic Vis Res. 2023 Apr 19;18(2):212-229.

Gallego-Pinazo R, et al. Med Hypothesis Discov Innov. 2014;3(4):111-114.

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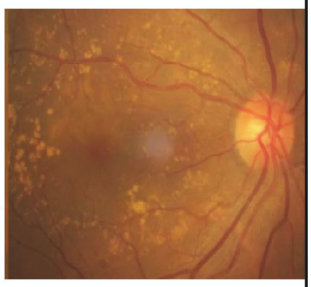
Pachydrusen

- Pachydrusen are large
  - Typically, >125 µm)
  - sub-RPE deposits that are yellow-white in color
- Deposits are distributed across the posterior pole and are isolated or clustered in small groups.
- The deposits appear with irregular, complex shapes but have distinct borders.
- Another important distinguishing feature is that these drusenoid lesions are associated with the presence of thickened choroid.



92

Pachychoroid Disease Spectrum (PDS)

- Choroidal vascular congestion/ attenuation
  - Thickened sclera
  - Lengthened intrascleral course of vortex veins
- Physiologic Factors
  - Excess choroidal interstitial fluid/choroidal vascular hyperpermeability (CVH)
  - Precapillary arteriolar hypertension
  - Altered intravascular osmolality (serum proteins (albumin))
  - Pharmacologic agents
    - Corticosteroids
    - Phosphodiesterase (PDE) inhibitors
  - Alterations in interstitial tissues in the choroid

B Brown R, Mohan S, Chhablani J. Pachychoroid Spectrum Disorders: An Updated Review. J Ophthalmic Vis Res. 2023 Apr 19;18(2):212-229.

Gallego-Pinazo R, et al. Med Hypothesis Discov Innov. 2014;3(4):111-114.

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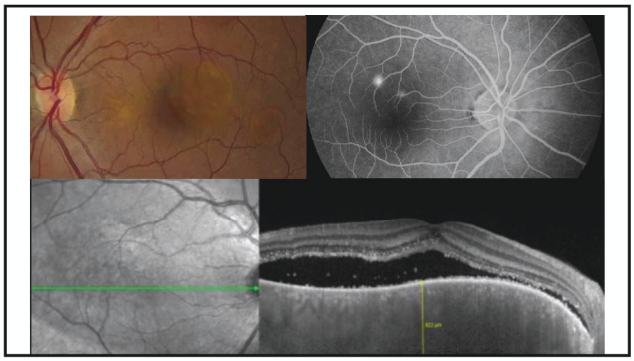

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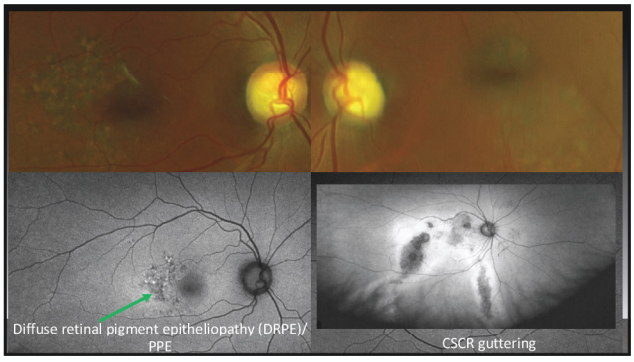

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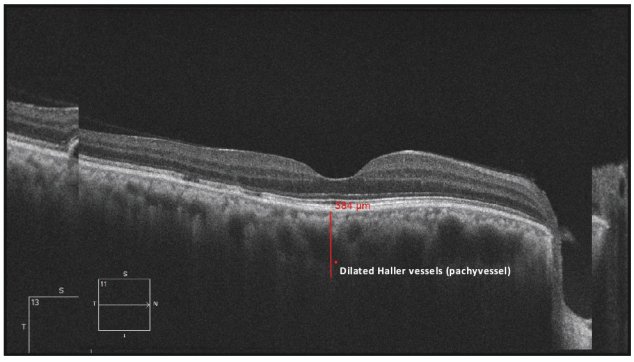

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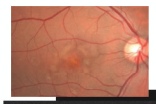
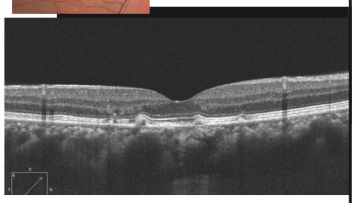
PACHYCHOROID PIGMENT EPITHELIOPATHY (PPE)

- Forme Fruste of CSC to Chronic CSC
- Orange red fundus appearance
- Absence of normal fundus tessellation
- RPE changes mistaken for ARMD or pattern dystrophy
- OCT scattered RPE elevations, small serous PEDs, thick choroid
- ICG shows mid-phase hyperfluorescence suggestive of hyperpermeability
- Fundus Autofluorescence shows granular hypoautofluorescence and stippled mixed areas of hyper and hypoFAF
- Management: Observation for progression to CSC, PVN, or even PCV



Retinal pigment epithelium (RPE) abnormalities



Gallego-Pinazo R, et al. Med Hypothesis Discov Innov. 2014;3(4):111-114

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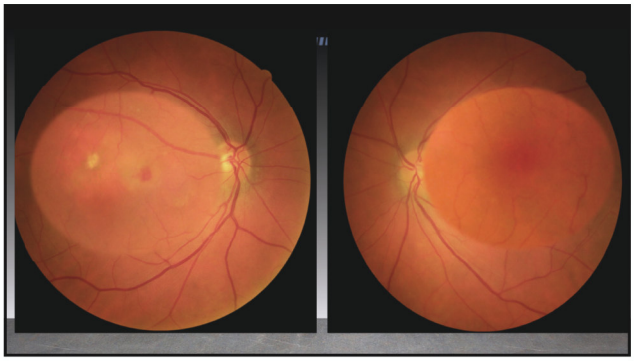

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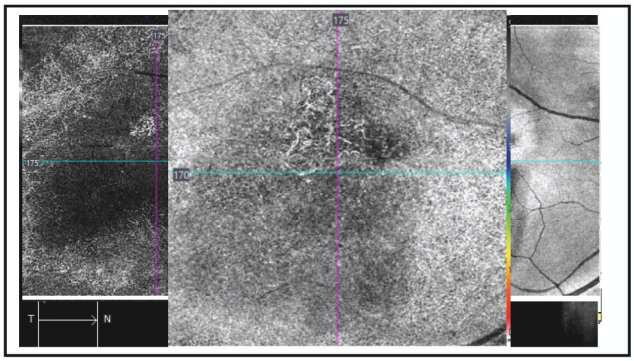

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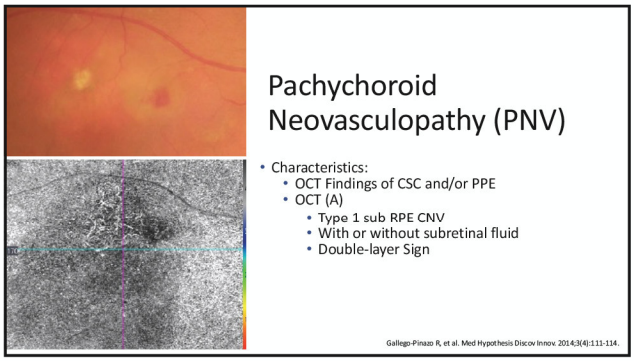

Pachychoroid Neovasculopathy (PNV)

- Characteristics:
  - OCT Findings of CSC and/or PPE
  - OCT (A)
    - Type 1 sub RPE CNV
    - With or without subretinal fluid
    - Double-layer Sign

Gallego-Pinazo R, et al. Med Hypothesis Discov Innov. 2014;3(4):111-114.

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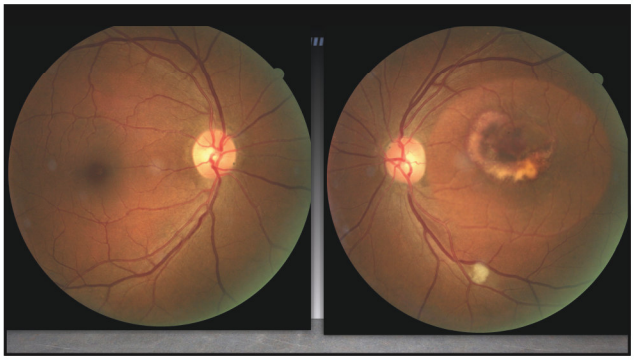

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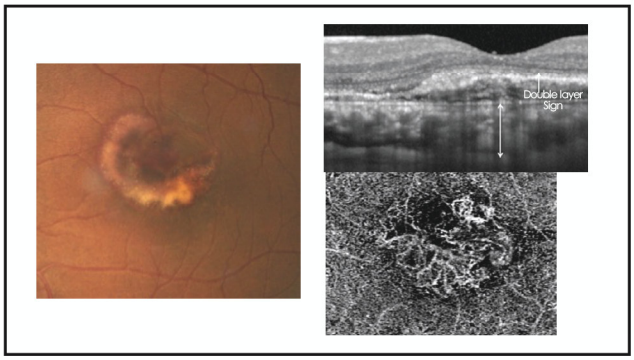

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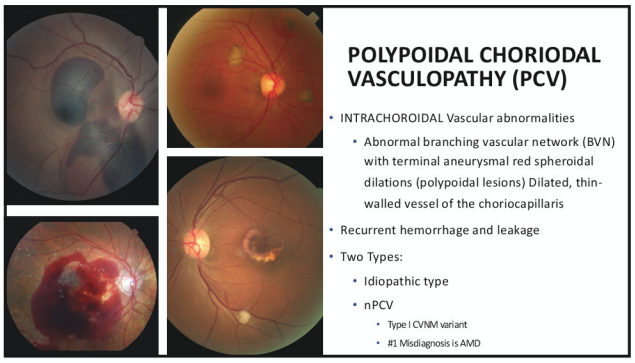

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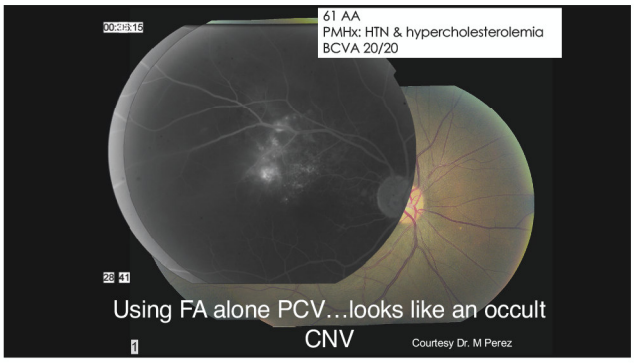

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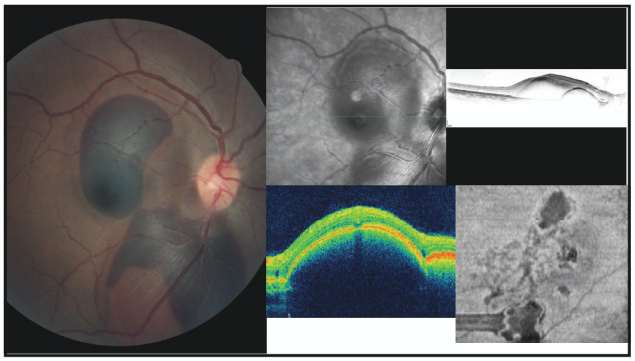

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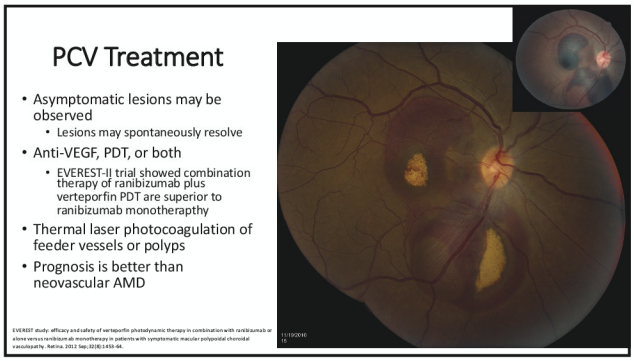

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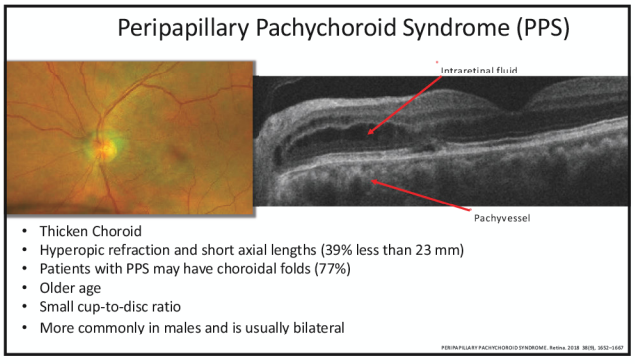

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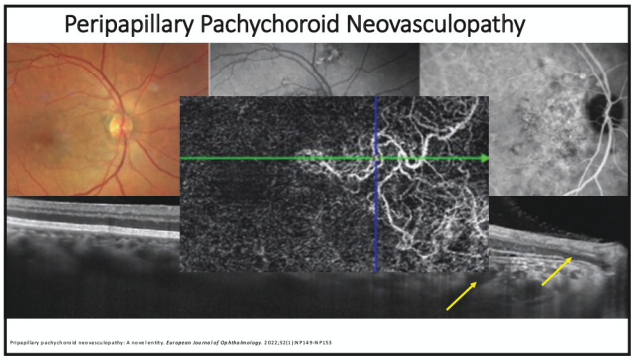

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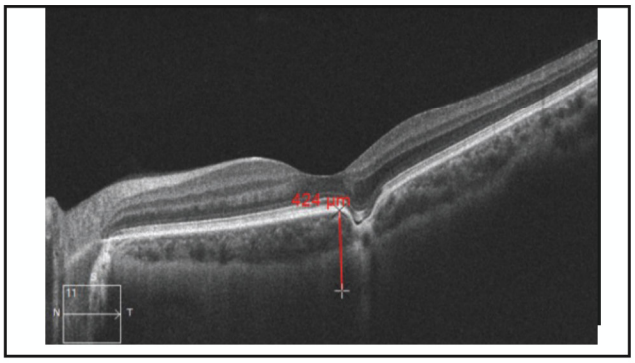

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Focal choroidal excavation (FCE)

FCE refers to a concavity of the choroid without local scleral changes

Often identified through a characteristic appearance on optical coherence tomography (OCT)

Unilaterally and is found incidentally on exam
Mostly diagnosed in fourth or fifth decade

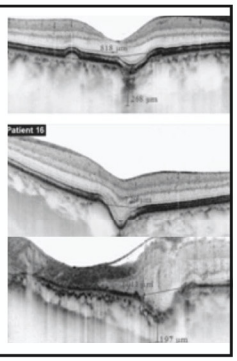
FCE are thought to be congenital, however, the pathophysiology of FCE remains unclear.

110

Focal Choroidal Excavation (FCE)

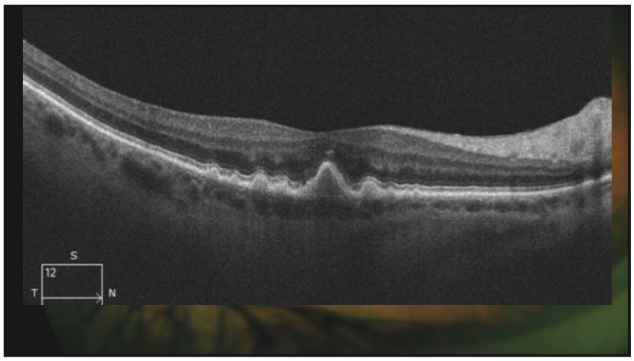
Three patterns

1. cone shaped—Most common pattern; all these cases had regular RPE on OCT and less degenerative changes on angiography, hence bearing a better prognosis.
2. Bowl shaped—Higher incidence of RPE disruptions on OCT and degenerative changes on angiography.
3. Mixed morphology—This pattern has features of both cone- and bowl-shaped FCEs.



Shinojima A , Kawamura A , Mori R , et al. Morphologic features of focal choroidal excavation on spectral domain optical coherence tomography with simultaneous angiography. Retina Phila Pa 2014;34:1407–14

111



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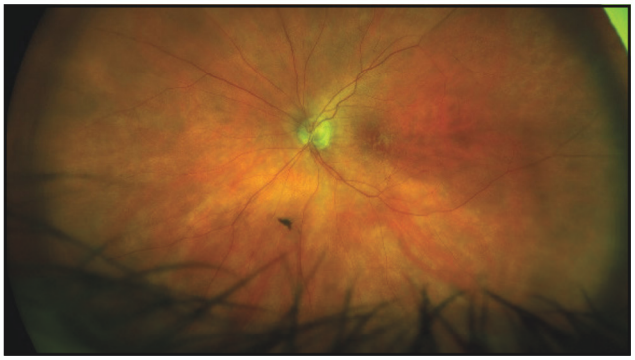

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Peripheral Exudative Hemorrhagic Chorioretinopathy (PEHCR)

First described by Annesley in 1980 as Peripheral Exudative hemorrhagic chorioretinopathy (PEHCR)

Bilateral

Predominantly affects older women

Signs include
Peripheral subretinal hemorrhage, subretinal fluid (SRF), exudation, and PED

Patients may be asymptomatic or have decreased visual acuity and flashes and floaters

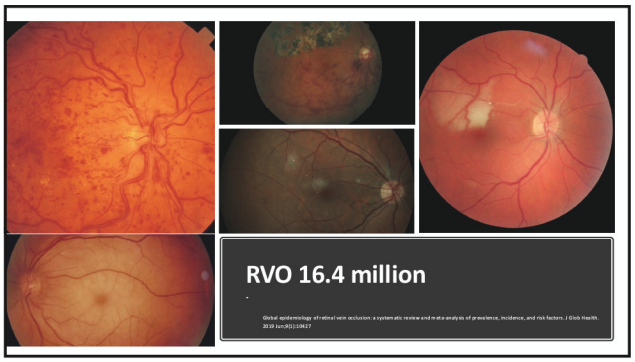
Has been postulated to be part of the Pachychoroid disease spectrum

One study found that the choroid in eyes with PEHCR is thickest in the temporal periphery

Club-shaped choroidal contour

Peripheral exudative hemorrhagic chorioretinopathy-A new addition to the spectrum of pachychoroid disease? Retina 2021;41:1518–1525.

114



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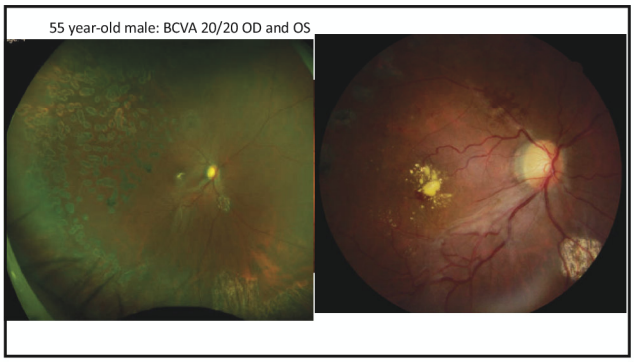

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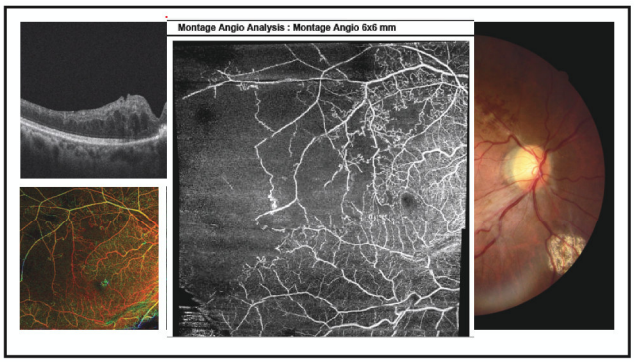

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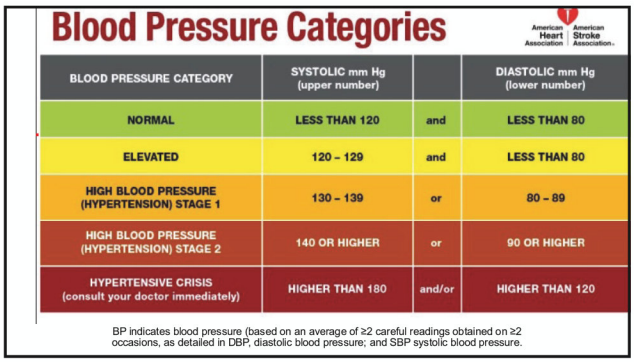
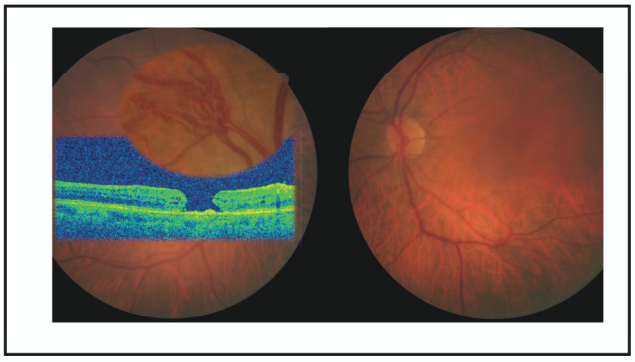


Blood Pressure Categories

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

BP indicates blood pressure (based on an average of ≥2 careful readings obtained on ≥2 occasions, as detailed in DBP, diastolic blood pressure; and SBP systolic blood pressure.

118



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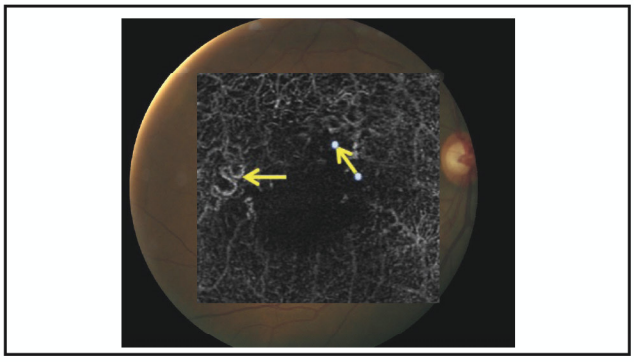

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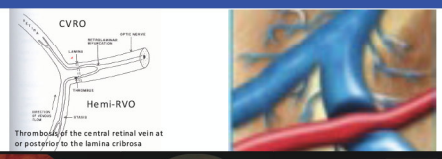
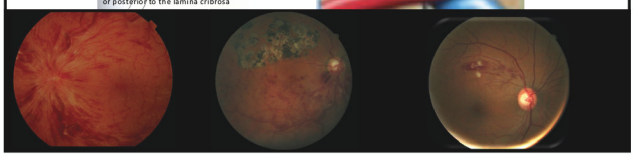
Pathogenesis of RVO



Thrombosis of the central retinal vein at or posterior to the lamina cribrosa



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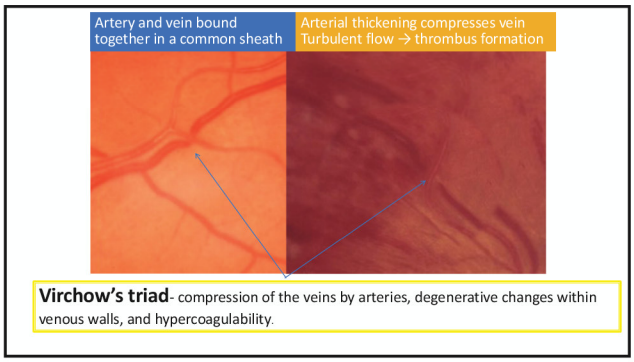
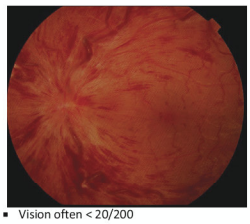
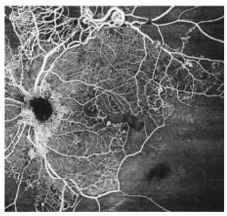


Virchow's triad- compression of the veins by arteries, degenerative changes within venous walls, and hypercoagulability.

122

Ischemic CRVO





Widespread capillary non-perfusion

- Vision often < 20/200
- +APD
- Greater VF deficits
- Widespread capillary non-perfusion on FA **(> 10 DD)**
- NVG
  - As high as 60% vs 5% Nonischemic
  - "the three month glaucoma"
- <10% developed retinal neovascularization

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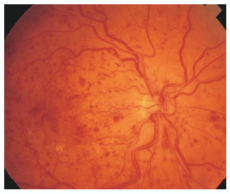
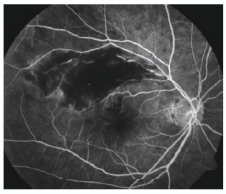
Non- Ischemic CRVO (75 %)

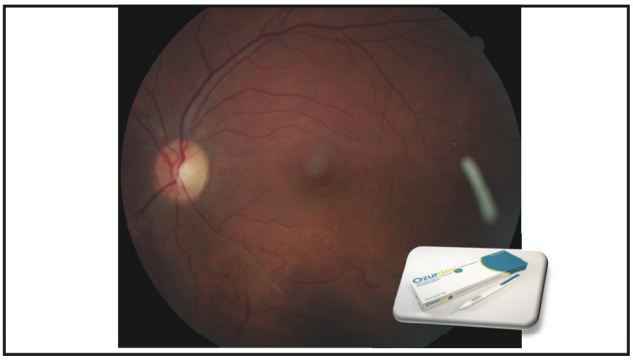




- Better vision and prognosis for spontaneous visual improvement
- 14% convert to ischemic within 4 months
- 1/3 with NVI / NVA

Natural history of central retinal vein occlusion: an evidence-based systematic review. Ophthalmology 2010;117:1094.

124



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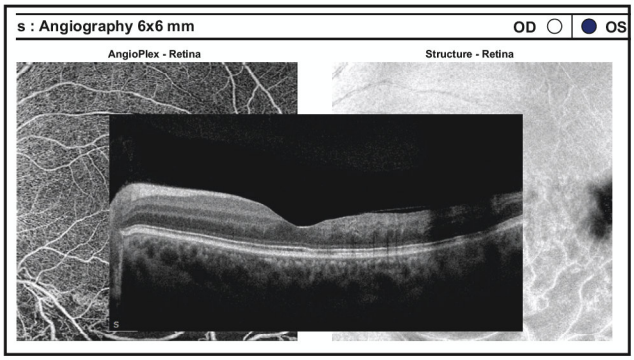

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VABYSMO (Faricimab) in AMD

FDA approved January 2022

10.27.2023

FDA Approves Genentech's Vabysmo for the Treatment of Retinal Vein Occlusion (RVO)

A humanized, bispecific monoclonal antibody, specifically designed for intravitreal use, that simultaneously binds and neutralizes both VEGF-A and Angiopoietin-2

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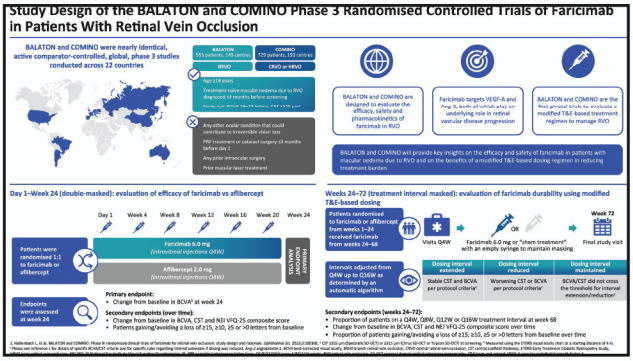

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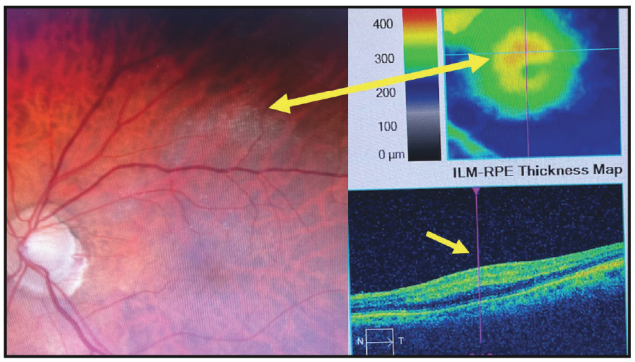

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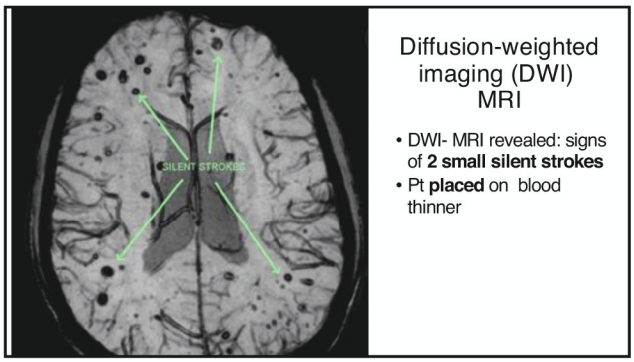

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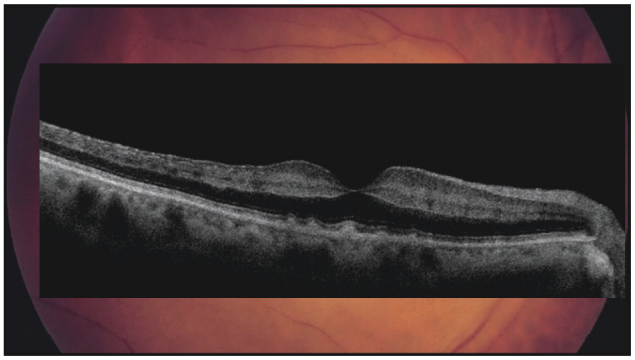

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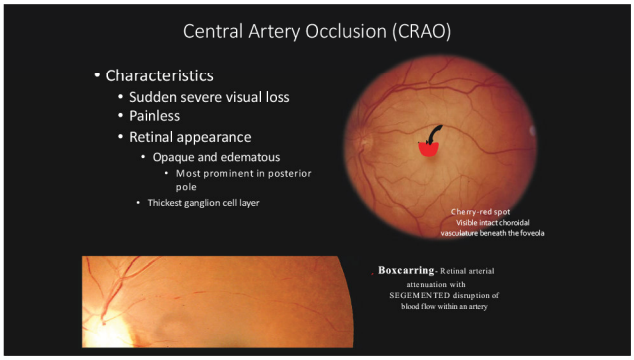

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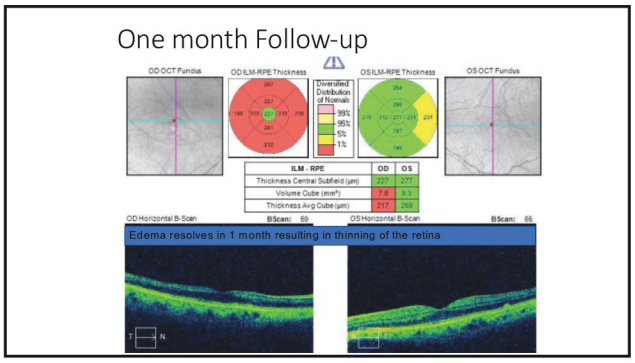

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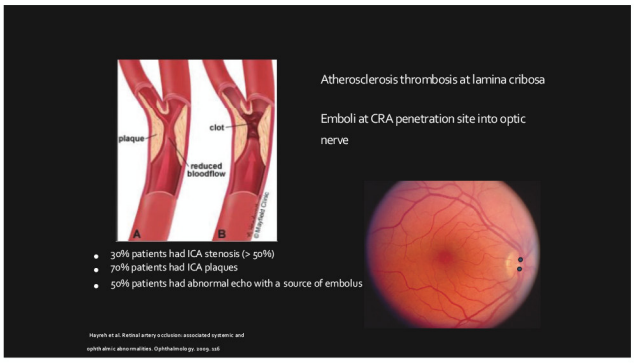

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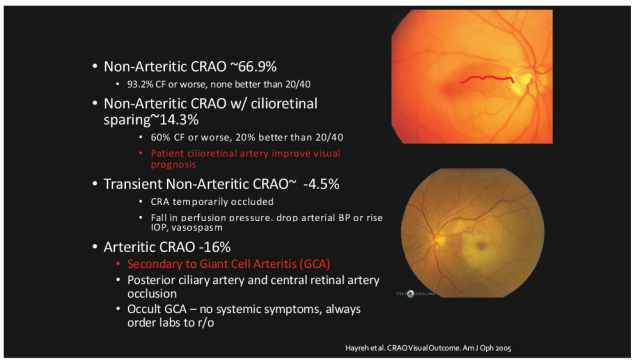

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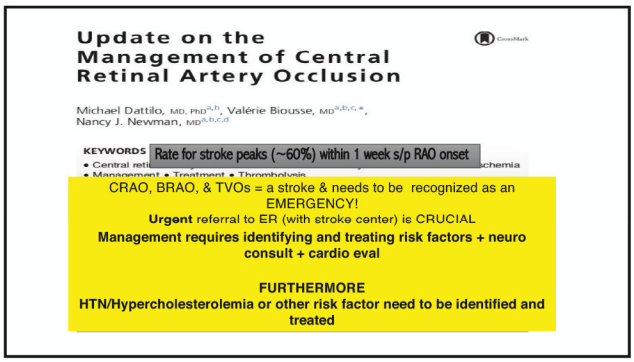

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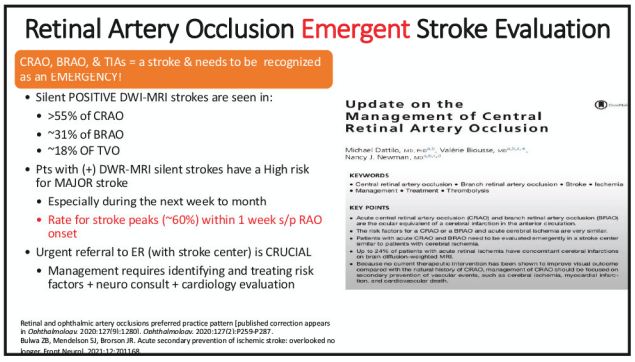

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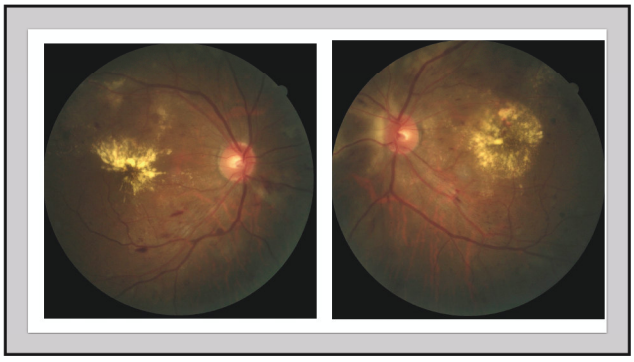

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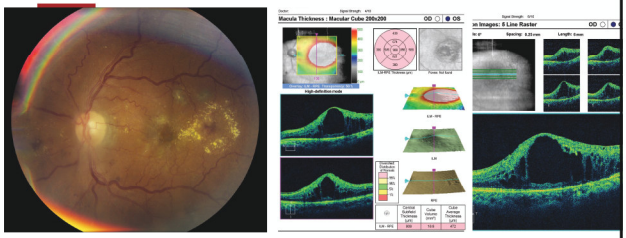
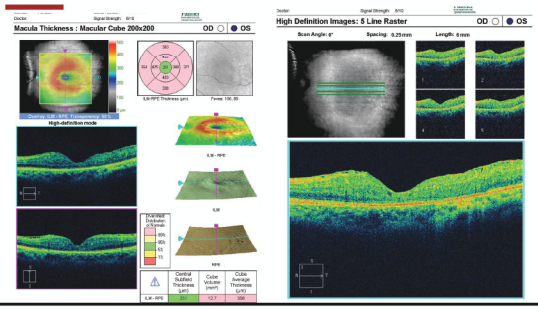
Diabetic Macular Edema (DME)

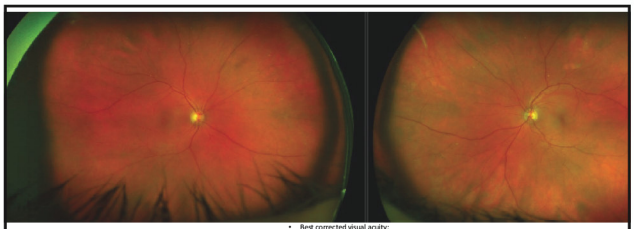


139

s/p serial Intravitreal Avastin Injections



140



78-yo White Female
s/p CE

- Best corrected visual acuity:
  - OD 20/50 NIPH
  - OS 20/20
- Extraocular motility: Full OU
- Amsler grid: metamorphopsia OS, unremarkable OD
- Pupils: OD 4 mm → 3 mm light OU; no RAPD
- IOP with applanation: OD 15 mmHg, OS 13mmHg

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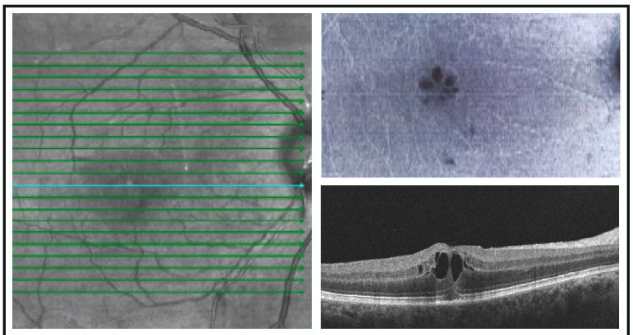

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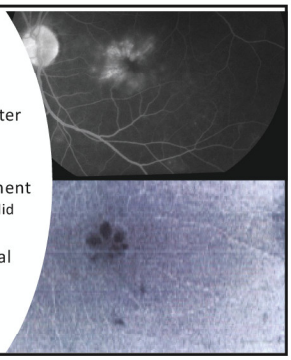
Irvine-Gass Syndrome

- Most common causes of visual loss after uneventful cataract surgery
- Benign, self-limiting, and resolves spontaneously without visual impairment
  - 26.8% of eyes with pseudophakic CME did not recover
- Represents breakdown of blood-retinal barrier due to inflammation
  - VEGF



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Pseudophakic Cystoid Macular Edema

- RTCX 3-4 weeks to determine improvement
- Persistent CME
  - steroid injection
  - Anti-VEGF drugs
  - Surgical therapy
    - Pars plana vitrectomy (PPV)

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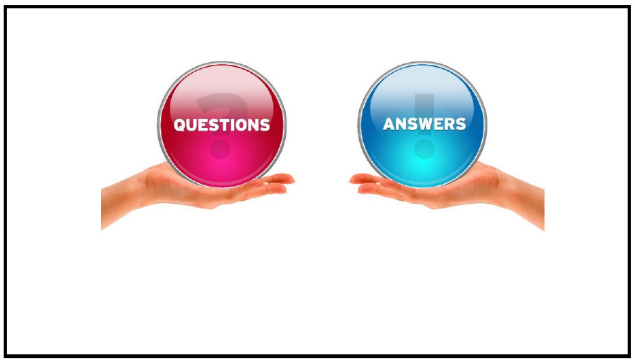

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