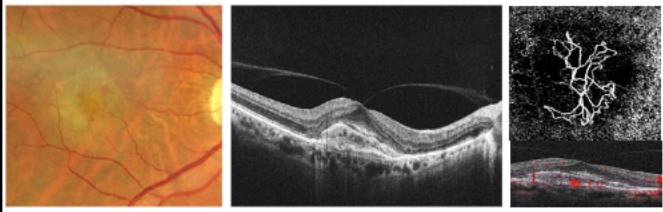


Contemporary AMD Care Utilizing Multimodal Retinal Imaging



Carolyn Majcher, OD, FAAO, FORS
Oklahoma College of Optometry

1

DISCLOSURES


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Disclosures:

- Paid consultant/speaker for:
 - Carl Zeiss Meditec
 - Iveric Bio (Astellas)
 - Apellis Pharmaceuticals
 - Regeneron Pharmaceuticals
 - Optomed
- Paid advisory board member for LENZ Therapeutics, Notal Vision, Ocuterra, Topcon, Tarsus, Genentech

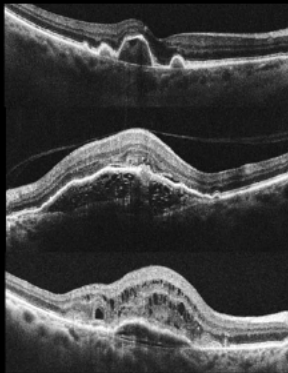
All financial relationships have been mitigated



2

ROAD MAP

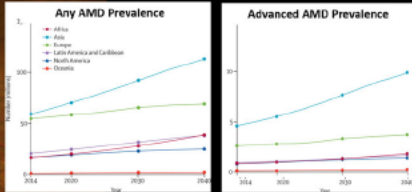
- Intro to AMD
- AMD staging/classification
- Retinal multimodal imaging technologies
- Utility of multimodal imaging in AMD
 - Nonexudative
 - Drusen subtypes
 - GA
 - High risk biomarkers for progression to advanced AMD
 - Neovascular & exudative AMD
- Home monitoring strategies to detect early conversion



3

AGE RELATED MACULAR DEGENERATION

- Leading cause of blindness in the developed world in persons >50yo
 - Characterized by drusen, RPE abnormalities, geographic atrophy (GA), choroidal neovascularization (CNV)
- Prevalence of AMD is expected to ↑ to 22 million by the year 2050
 - # of cases of advanced AMD is expected to ↑ from 1.7 million in 2010 to 3.8 million in 2050

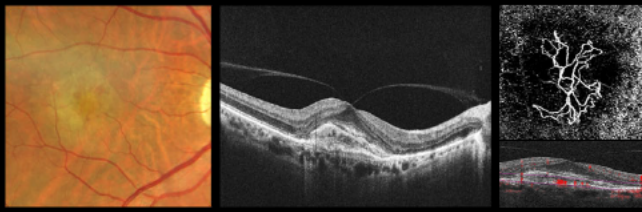


Global prevalence of AMD and disease burden projection for 2020 and 2040: a systematic review and meta-analysis. The Lancet Global Health 2018.

4

AGE-RELATED MACULAR DEGENERATION

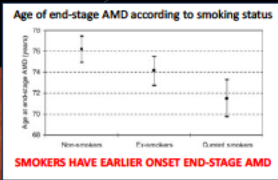
- Of all AMD, approx. 80% nonexudative/20% exudative
 - Neovascular exudative AMD accounts for 90% of severe central VA loss



EARLY DETECTION AND PROMPT TREATMENT OF EXUDATIVE AMD IS CRITICAL TO MAXIMIZE VISUAL OUTCOMES!!!

5

RISK FACTORS FOR AMD

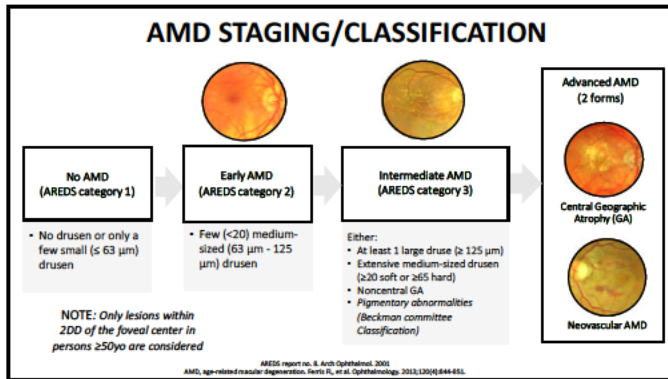


SMOKERS HAVE EARLIER ONSET END-STAGE AMD

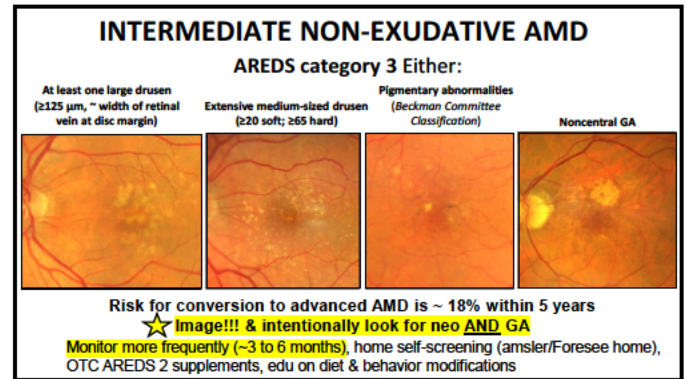
- Older age
- Caucasian
- Genotype/family HX of AMD
 - ARMS2/HTRA1
 - CFH
- Smoking**
 - Most sig modifiable risk factor for AMD (odds ratios = 2.35-3.12 current vs never)
- HTN & Heart Disease
- High BMI/Obesity - (mild assoc)
- Hypercholesterolemia (high dietary cholesterol intake esp saturated fats and cholesterol)
- Diet low in omega 3, vitamins/minerals, carotenoids, antioxidants

American Academy of Ophthalmology 1997 National Eye Institute, International Retinal Degeneration Prevention Practice Pattern 2018. Hughes RD, et al. ARMS2-HTRA1 variants are associated with age-related macular degeneration. N Engl J Med 2007.

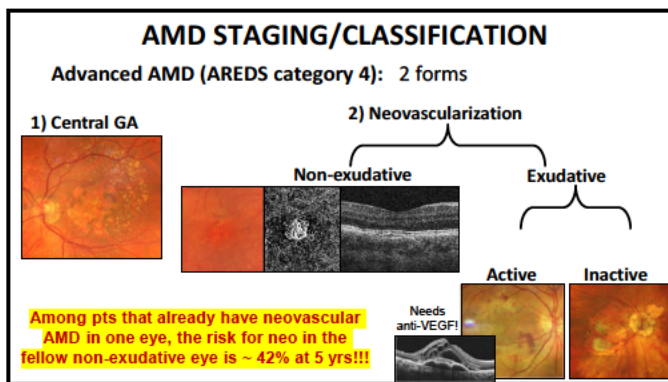
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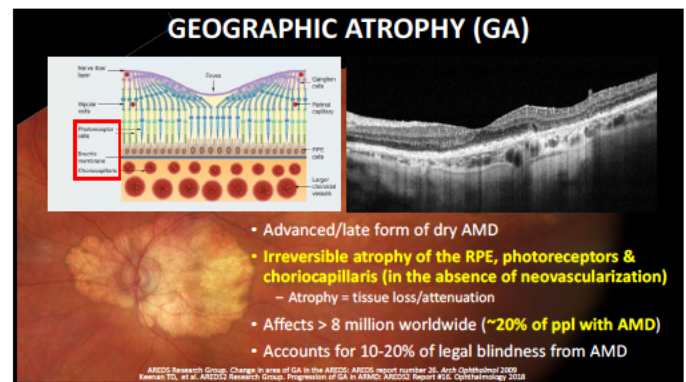
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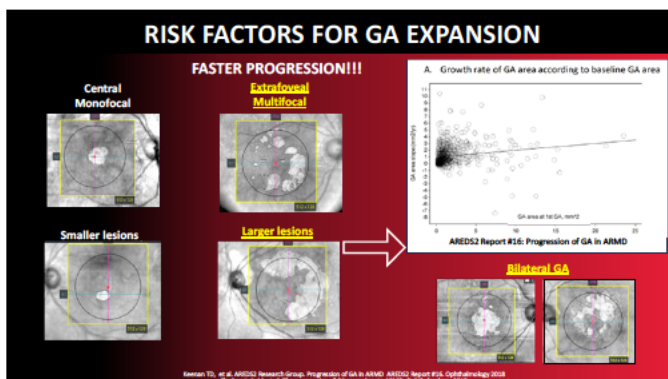
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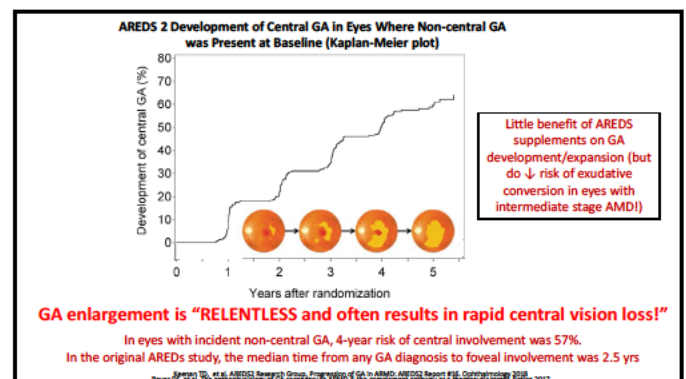
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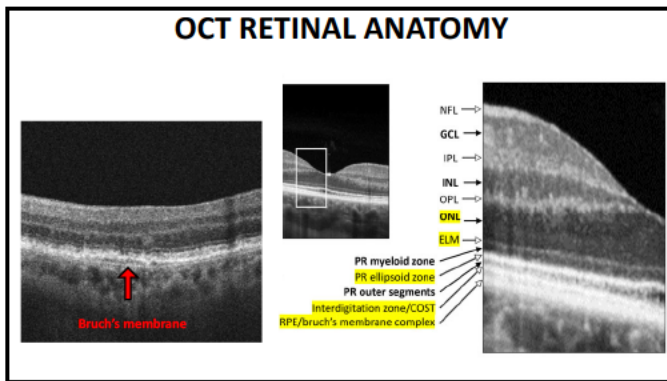
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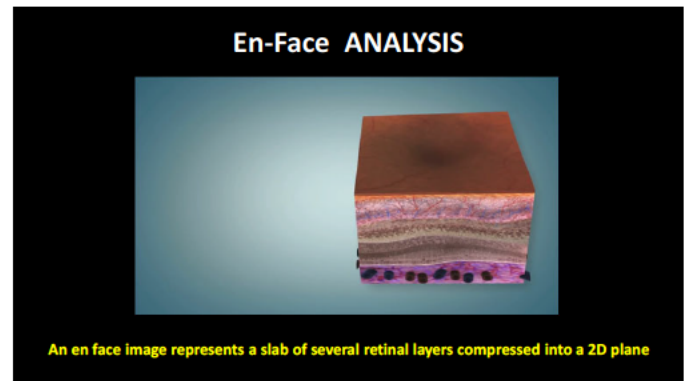
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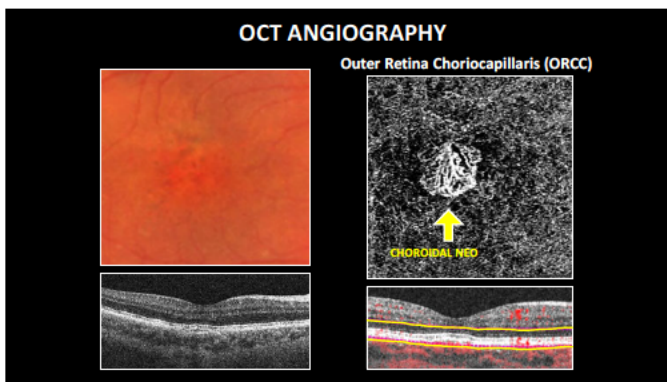
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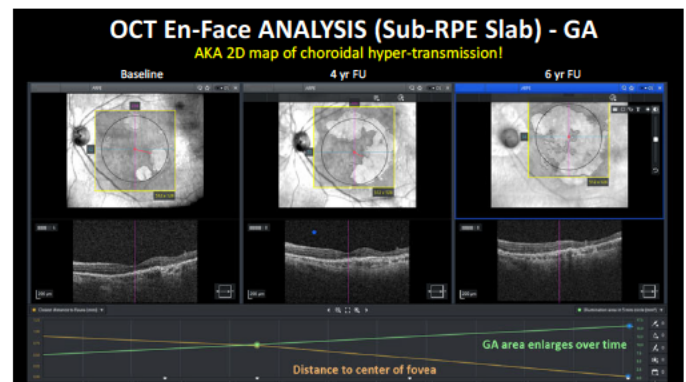
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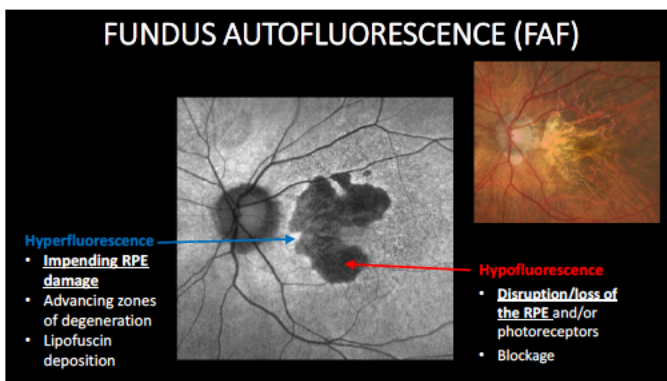
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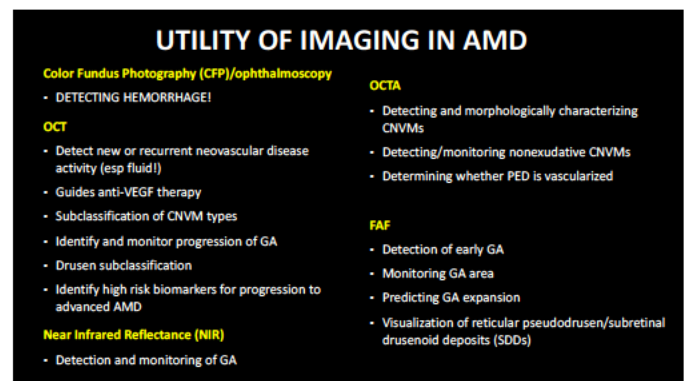
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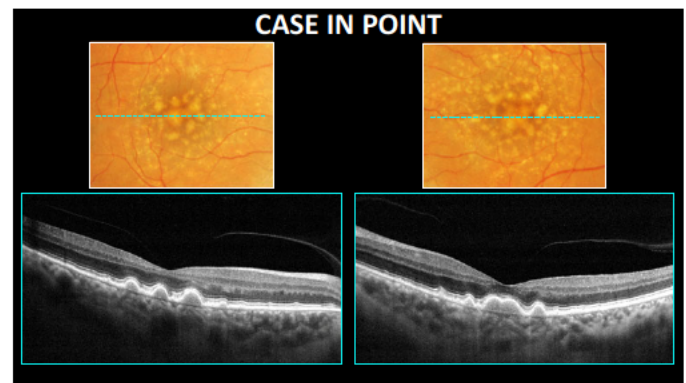
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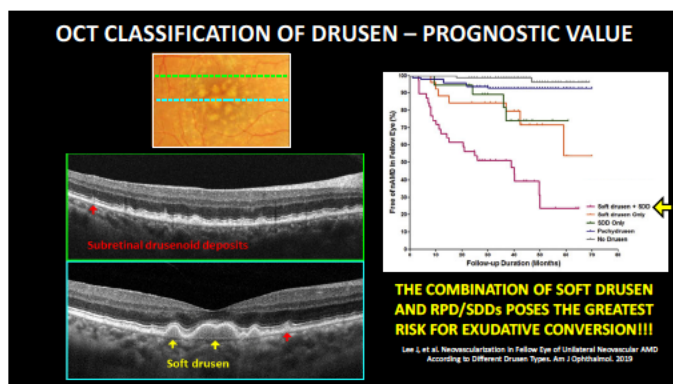
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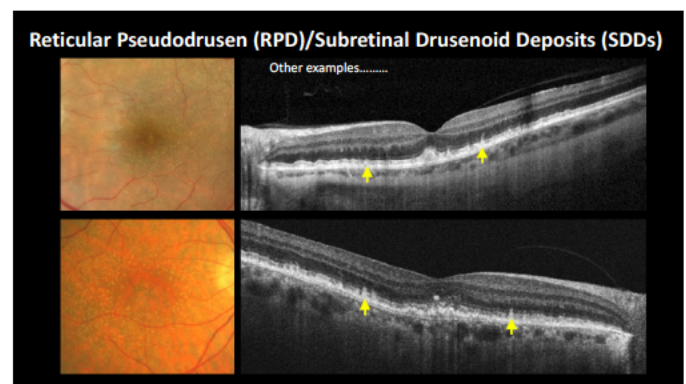
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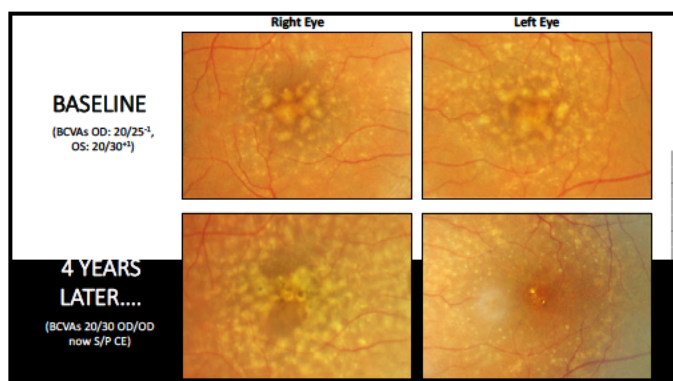
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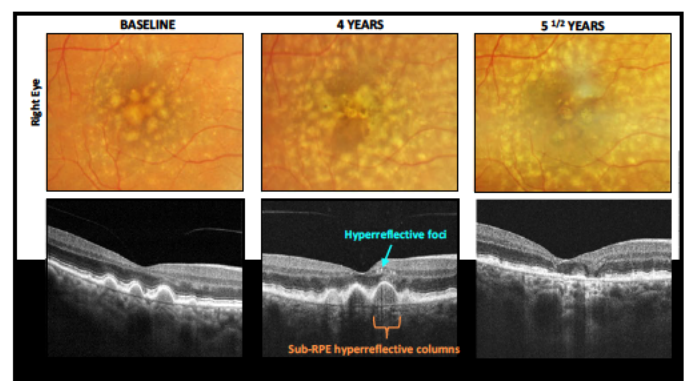
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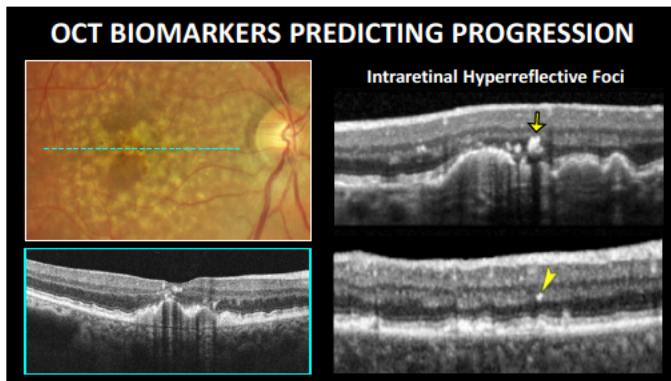
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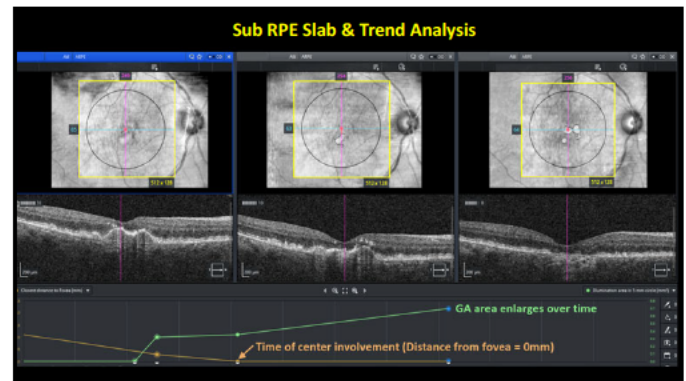
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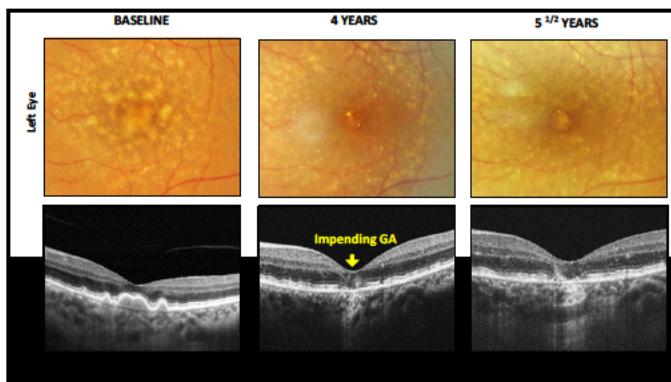
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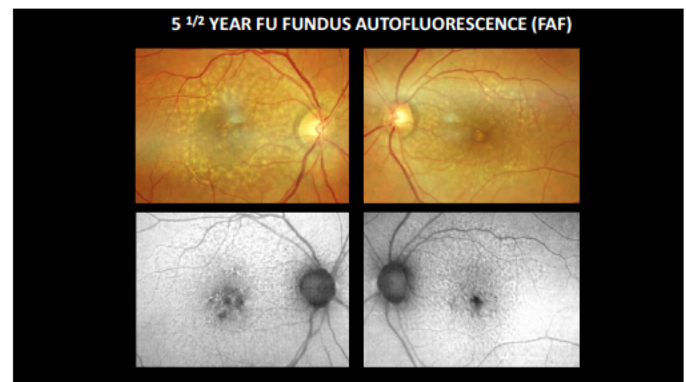
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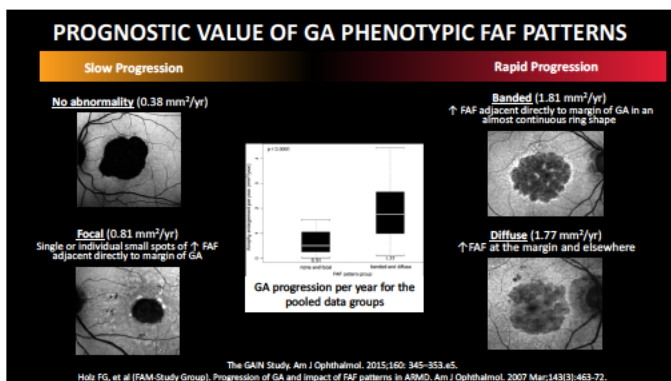
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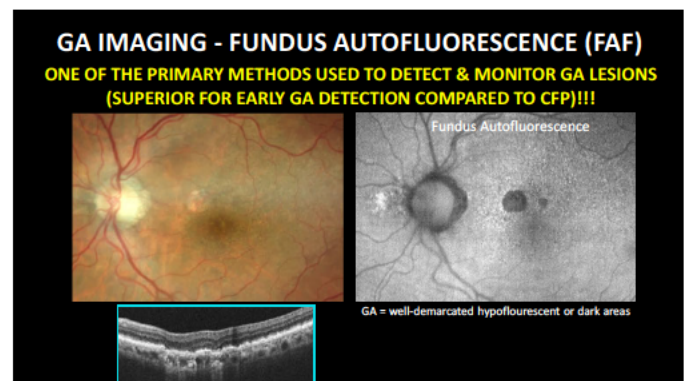
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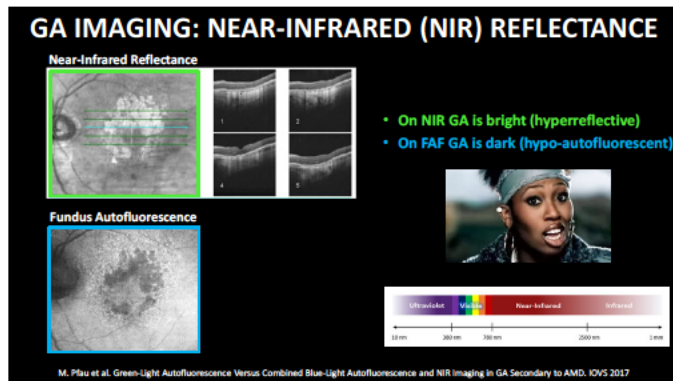
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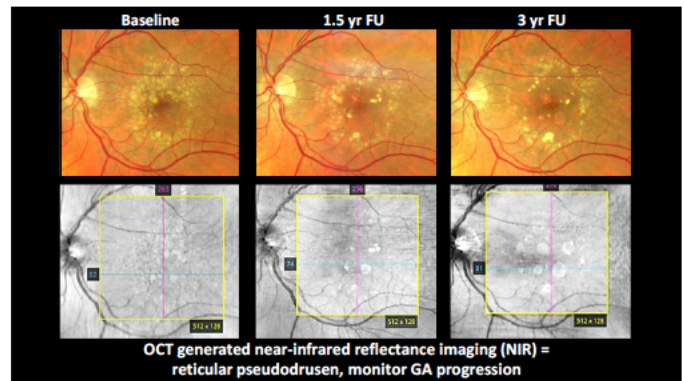
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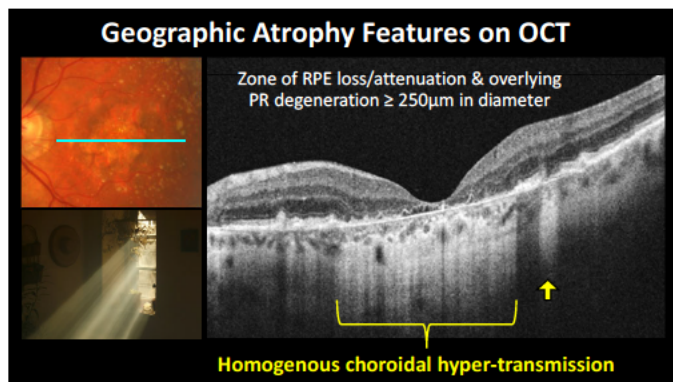
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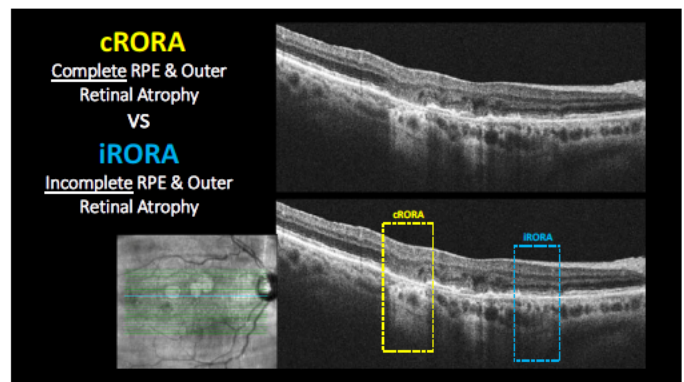
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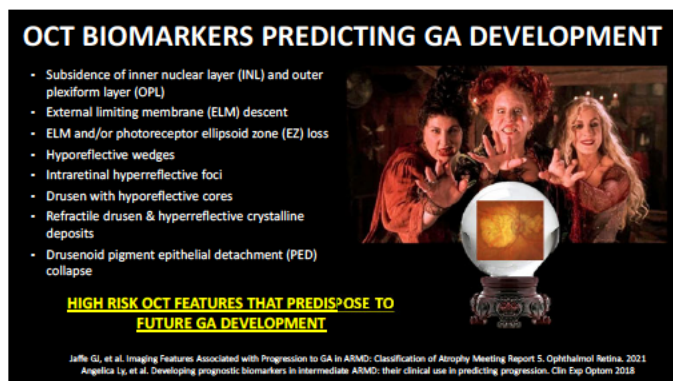
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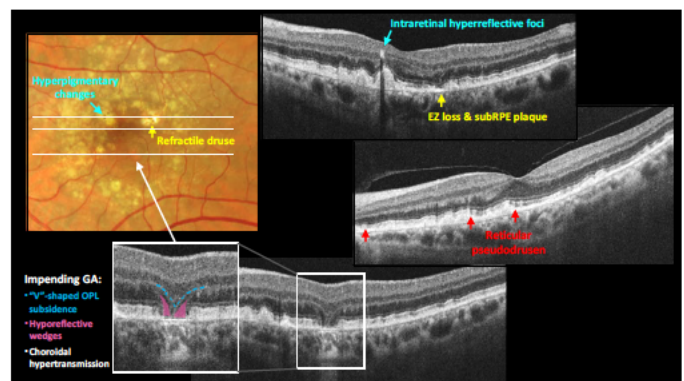
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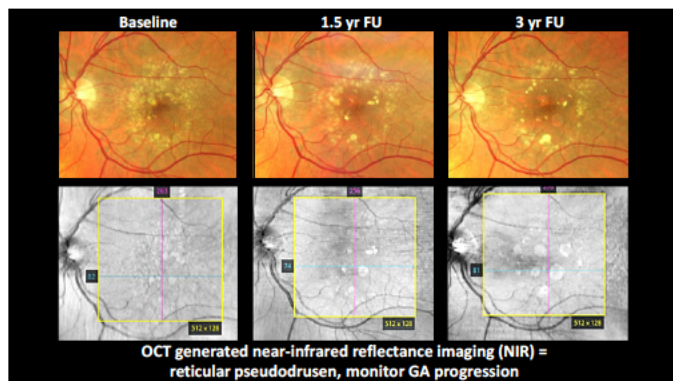
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Newly Approved Complement Inhibition Therapy for GA

C5	Avacincaptad Pegol (IZERVAY*)	Pegcetacoplan (SYFOVRE*)	C3
Approved Aug 2023		Approved Feb 2023	
GA secondary to AMD/2mg intravitreal injection monthly for up to 12 months		GA secondary to AMD/15mg intravitreal injection every 25-60 days (monthly or EOM)	
C5		C3	
Gather 1 & Gather 2		OAKS & DERBY	
Only non-center point involving GA in part within 1500 µm from the foveal center included		Key differences in study design	GA lesions with (~65%) and without subfoveal involvement included
Pts with CNV in fellow eye excluded			CNV in the fellow eye was not exclusionary
Inclusion criteria in all trials: - BCVA 20/320 or better, no neo or exudation in study eye			
- Total GA area between 2.5 - 17.5 mm² (1 - 7 disc areas) via FAF			
Primary endpoint: Change in total GA lesion area on FAF			

38

Which patients with GA should you refer?

Those most **likely** to benefit:

- Extrafoveal GA esp those demonstrating progression over time (or with surrounding FAF hyperautoFL) or those with central involving GA in the fellow eye
- Pts motivated to undergo intravitreal injection at least every other month
- Pts that have enough life left to live to experience a benefit from treatment

IF YOU HAVE DOCUMENTATION OF PROGRESSION SEND IT TO THE RETINAL SPECIALIST WHEN YOU REFER

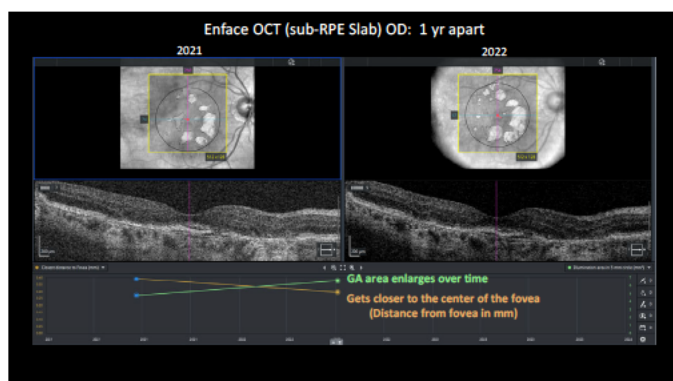
Disclaimer* These are my own personal opinions/thoughts

39

Case: 81yo female – complaining of progressive decrease in vision OS > OD

Right eye: 20/40
Left eye: 20/100

40



41

Which patients with GA should you **NOT** refer?

Those **unlikely** to benefit:

- Neovascular/exudative AMD or hx of anti-VEGF treatment in the affected eye? (fellow eye OK)
- Disciform macular scars
- Extensive central-involving GA with poor acuity
- Stable GA lesions (no surrounding FAF hyperautoFL)
- RPE atrophy from other cause (POHS, AOFVD, IRD, etc.)
- Presence of other confounding disease limiting BCVA (end stage glaucoma, etc.)

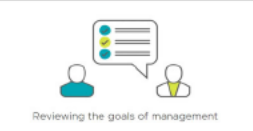
BCVA CFs

Disclaimer* These are my own personal opinions/thoughts

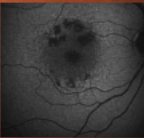

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PATIENT EDUCATION

- GA is progressive and irreversible
- Set realistic expectations: Treatment **slows progression**, does not halt GA enlargement
 - Vision will continue to get worse even with tx
- Administered via **INTRAVITREAL INJECTION** monthly or every other month
- Chronic therapy**
- Importance of home self-screening for exudative conversion

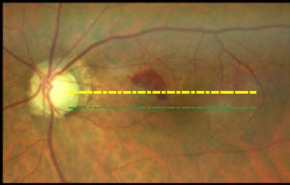
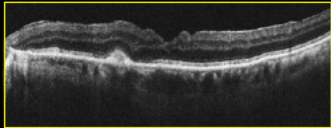
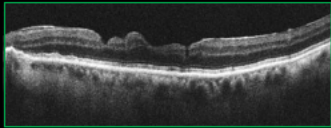
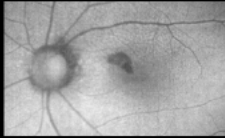


Reviewing the goals of management

43

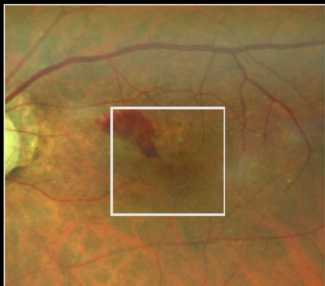
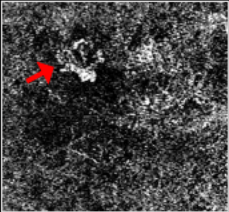
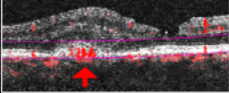
IT'S THE LITTLE THINGS THAT MATTER MOST

What stage/classification AMD? Plan?

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IT'S THE LITTLE THINGS THAT MATTER MOST

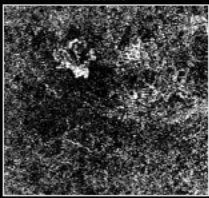
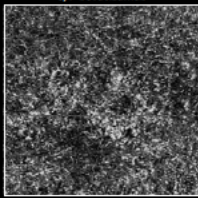
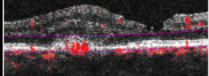
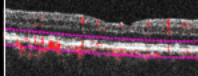
45

IT'S THE LITTLE THINGS THAT MATTER MOST

OCTA before & after 3 bevacizumab injections OS

Baseline

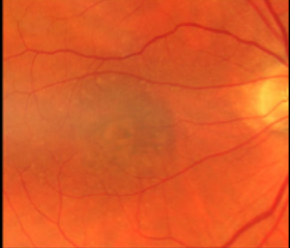
S/P bevacizumab

46

CASE 2

- 69yo male
- CC: No visual complaints (DM exam)
- Oc Hx:
 - Cataracts OU
- Med Hx:
 - HTN, Type 2 DM, chol
- Vision: BCVAs @dist
 - OD 20/40 PHNI (was 20/25 last year)
 - OS 20/20


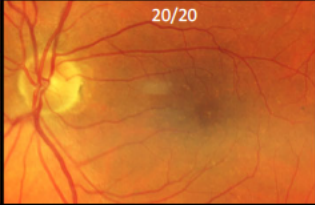
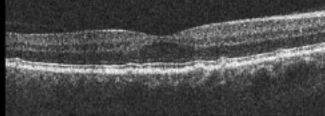
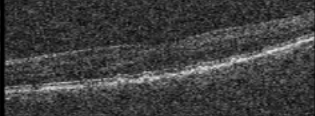


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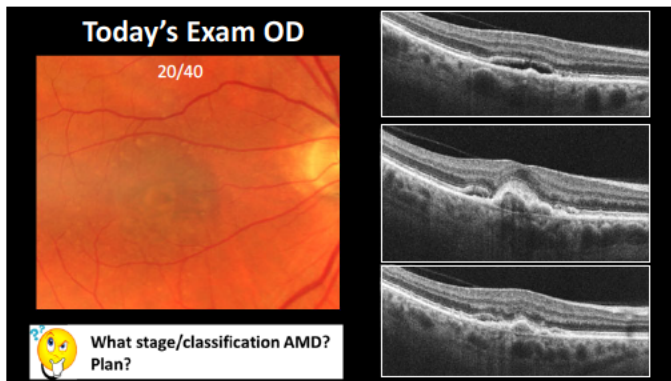
Images from 1 yr ago....

20/25

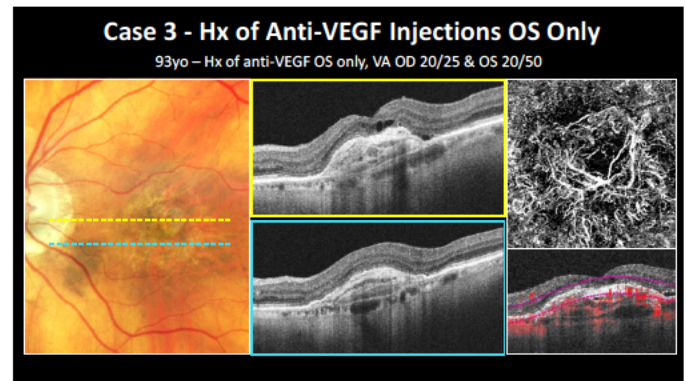
20/20

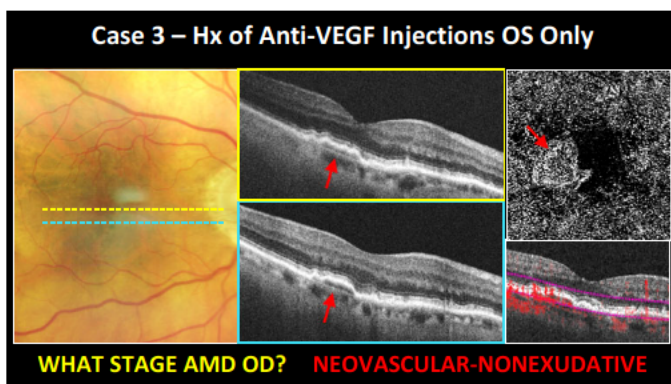
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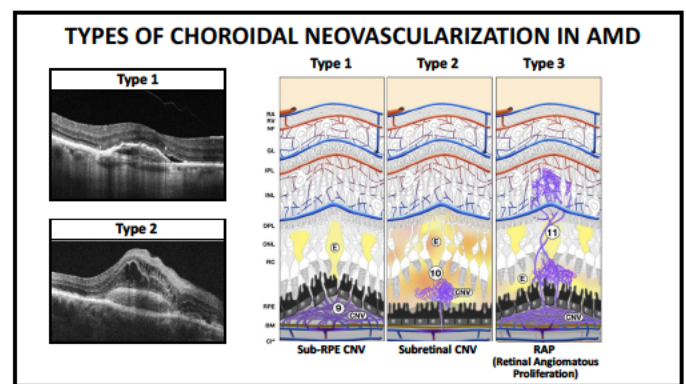
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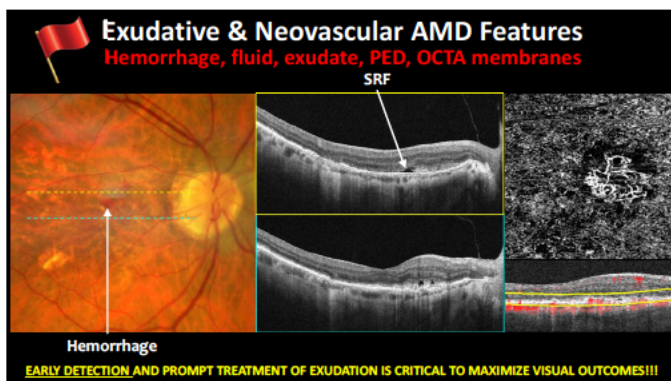
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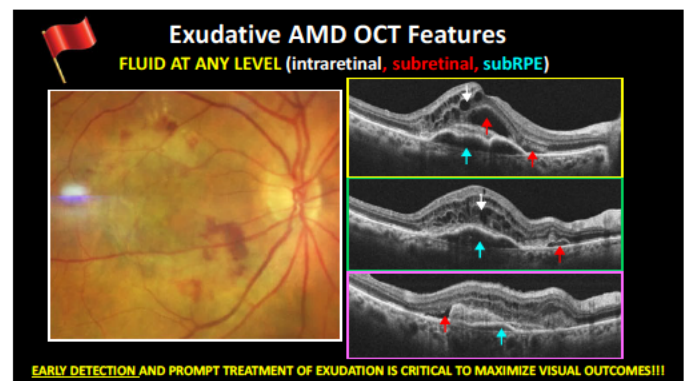
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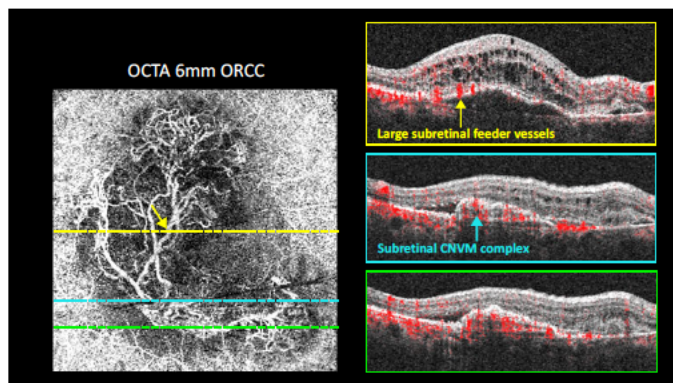
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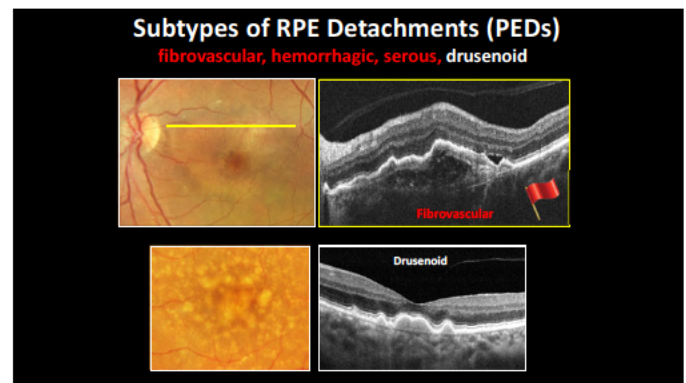
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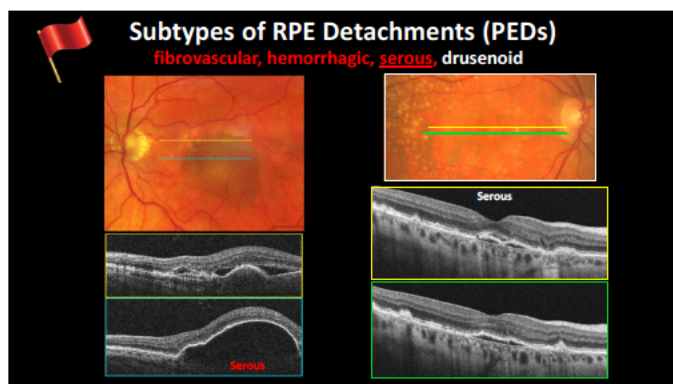
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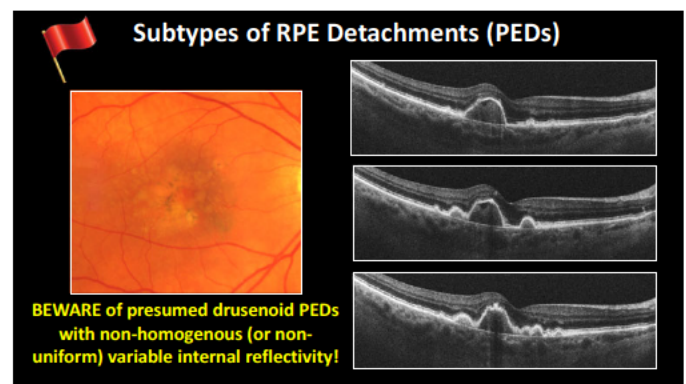
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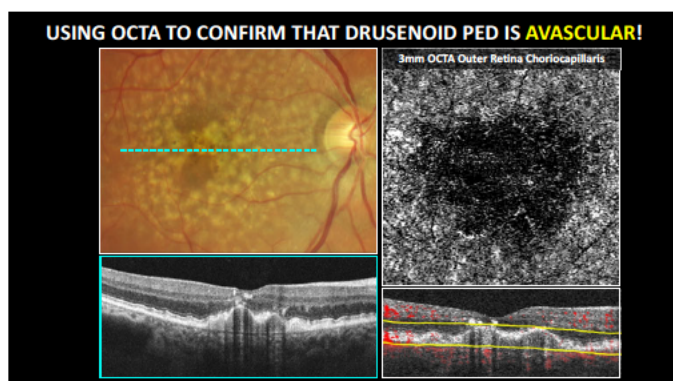
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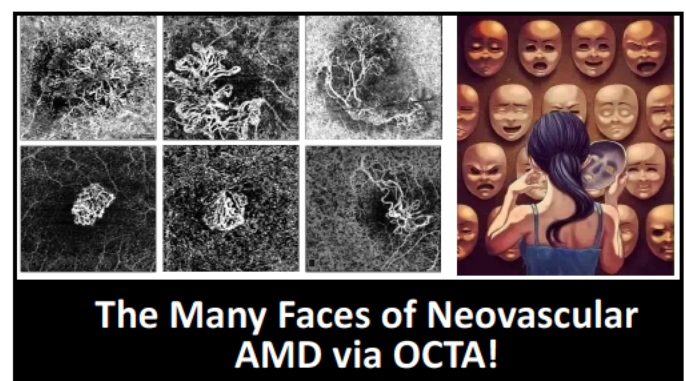
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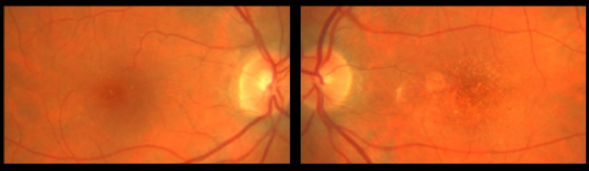
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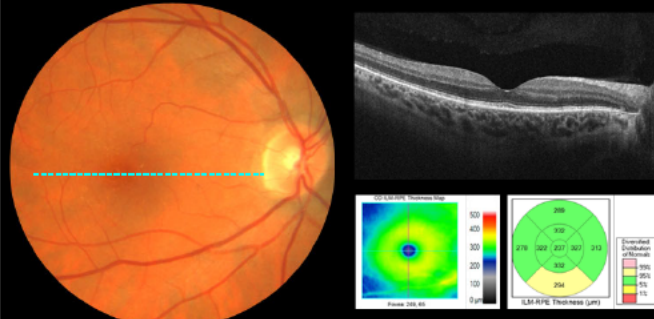
DON'T WAKE THE SLEEPING DRAGON

- CC: **Routine exam**, no visual complaints
- Oc Hx:
 - Dry AMD x 5 years OU**, taking AREDS 2
 - Cataract NS 1+ OU
- Med Hx:
 - HTN, Type 2 DM
 - Never smoker
- Vision: BCVAs @dist
 - OD 20/20
 - OS 20/40+1**



61

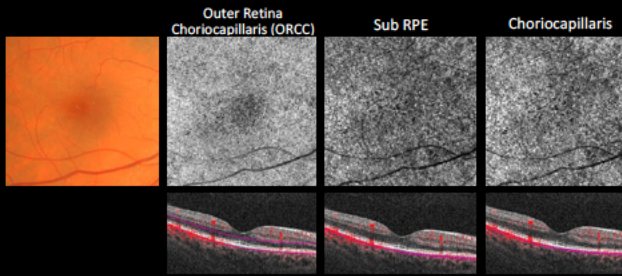
DON'T WAKE THE SLEEPING DRAGON



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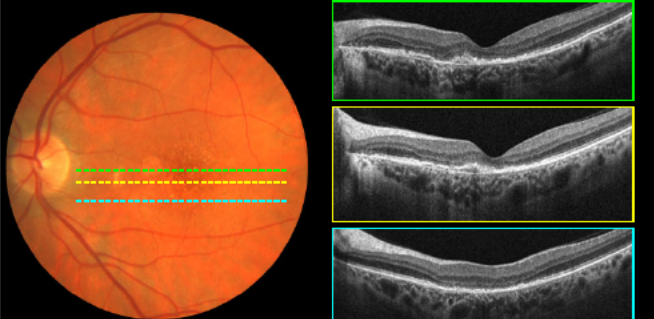
DON'T WAKE THE SLEEPING DRAGON

OCT Angiography 6mm Macula OD



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DON'T WAKE THE SLEEPING DRAGON

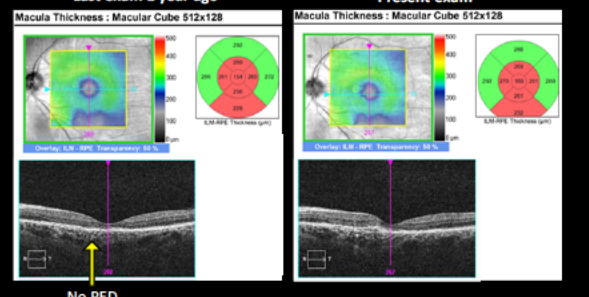


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DON'T WAKE THE SLEEPING DRAGON

Last exam 1 year ago Present exam

Macula Thickness : Macular Cube 512x128

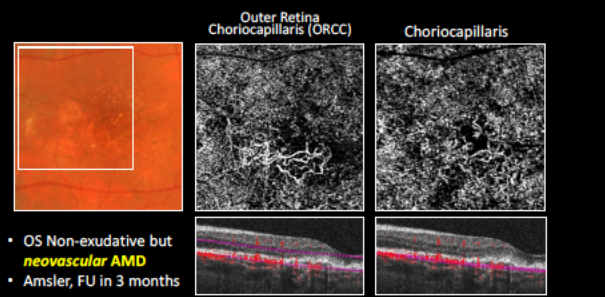


No PED

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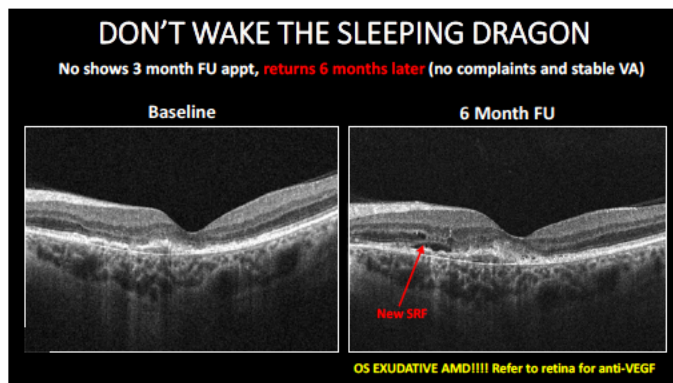
DON'T WAKE THE SLEEPING DRAGON

OCT Angiography 3mm Macula OS

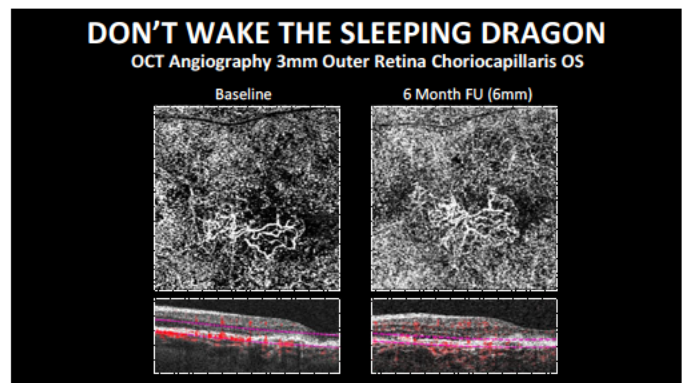


- OS Non-exudative but **neovascular AMD**
- Amsler, FU in 3 months

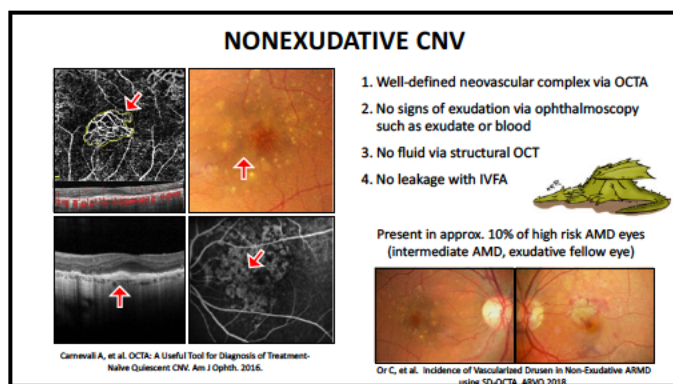
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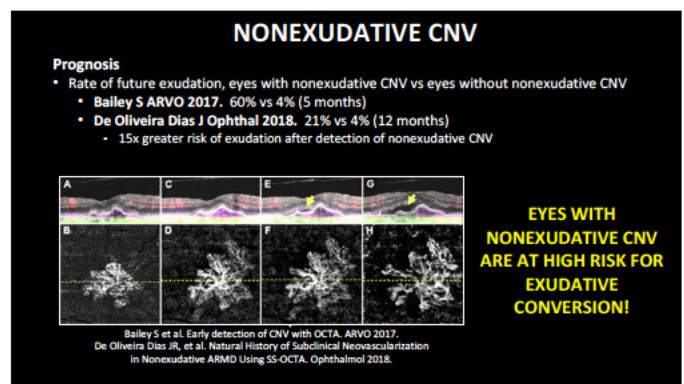
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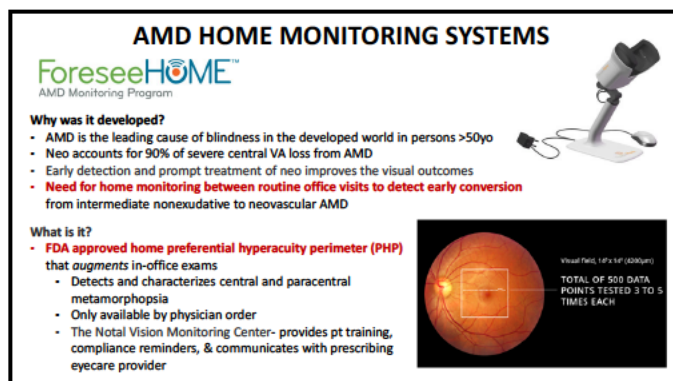
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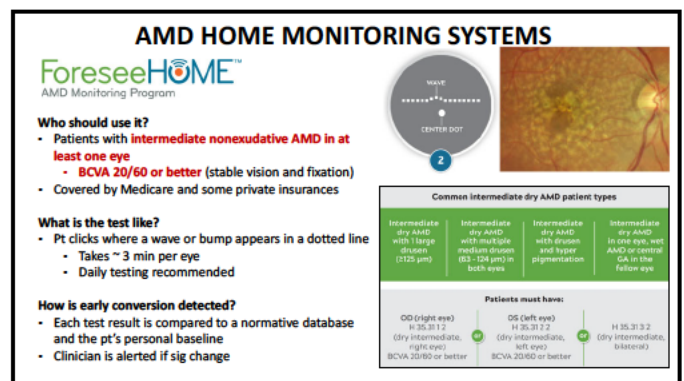
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AMD HOME MONITORING SYSTEMS

ForeseeHOME™
AMD Monitoring Program

DOES RESEARCH SUPPORT ITS USE?

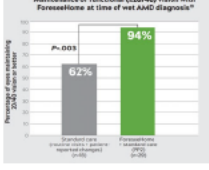
AREDS 2 HOME Study

- Foresee Home identified 64% of converters
- Functional vision ($\geq 20/40$) at conversion was maintained in 94% of patients using Foresee Home vs 62% without

ALOFT Study (Analysis of the Long-term Visual Outcomes of ForeseeHome Remote Telemonitoring)

- Large retrospective review of clinical data from 2010 to 2020 (3,334 eyes)
- 52% of conversions detected by system alert
- Median acuity measures of converters at:
 - Baseline 20/30
 - Initial conversion 20/39
 - Final follow-up 20/32
- 82% of eyes that converted had functional vision ($\geq 20/40$) at final follow up

Home OCT device in development



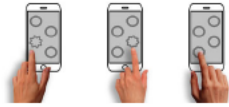
Chew EY, et al. Randomized Trial of the ForeseeHome Device for Early Detection of nAMD. Home Study Report Number 1. Contemp Clin Trials 2014.
Ho AC, et al. Real-World Performance of a Self-Operated Home Monitoring System for Early Detection of nAMD. J Clin Med 2021.
Mithal M, et al. Analysis of the Long-term Visual Outcomes of ForeseeHome Remote Telemonitoring - The ALOFT study. Ophthalmology Retina 2022.

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AMD MOBILE MONITORING SYSTEMS

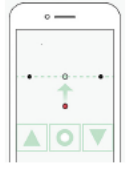
myVisionTrack (mVT®) app

- Smartphone and tablet-based app
- Based on shape discrimination hyperacuity testing
- Monitors progression of DME and AMD
- Prescription required
- Clinician is alerted if significant change in test results



Alleye app

- 2 different app versions:
 - AlleyeOne: for those at increased risk of retinal disease
 - Alleye: for those with existing retinal disease (AMD & DME)
- Assesses vernier acuity using an alignment task
- In studies, 52-66% of the pts who came to the clinic bc of a + test result received an intravitreal injection
- Register as a provider online (<https://alleye.io/provider>)



MaculaTester app

- Electronic version of the Amsler grid
- Record areas of distortion by touching screen
- Does NOT automatically detect progression or communicate with doctor
- Can set up reminder notifications

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Take Home Message


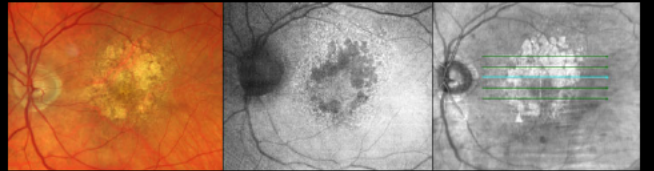
- Be familiar with features suggestive of exudative AMD (blood, fluid, PED, etc)
- OCT/OCTA allows for earlier detection of neovascularization and exudation in AMD = Earlier treatment = Vision preservation!!!
- OCTA is the only method of detecting and monitoring growth of non-exudative CNV membranes
- Look (with FAF & OCT) and refer patients with GA that may benefit from newly approved therapies
- Recognize OCT biomarkers for conversion from intermediate nonexudative AMD to advanced AMD



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Thank You!

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