

AMD: Through A Patient's Eyes

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Disclosure

- ▶ I have been on advisory boards/a consultant to/received honoraria from/ or been on speakers bureau list of the following:
 - ▶ Allergan, Bausch & Lomb, Luneau Technology, Maculogix, Notal, Optos, Optovue, VSP, ZeaVision

These affiliations will have no affect on the content of this lecture



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How do you look at AMD?

- ▶ Is it through your eyes?
- ▶ Or is it through the eyes of your patients?
 - ▶ What is their perspective?
- ▶ Goals for this talk:
 - ▶ Discuss tests that patient go through from original diagnosis through treatment from their point of view.
 - ▶ Discuss treatment modalities for AMD and how they affect patient quality of life.
 - ▶ Discuss ways to improve patient outcomes through experienced and education.

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What do your patients know about AMD?

- ▶ They may ask "Which is better, the dry kind or the wet kind" or they may ask "Do I have the good kind"
- ▶ They know somebody that is "blind" from AMD
- ▶ They probably don't know why somebody in their family lost vision.....

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Large Unmet Need

Prevalence of AMD

- 9.2 million Americans
- 7 out of every 100 adults over 40 years old
- 1 out of every 8 adults over 60 years old
- 1 out of every 3 adults over 75 years old

Prevalence of diabetic retinopathy

- 4.9 million Americans
- 3 out of every 100 adults over 40 years old

Prevalence of glaucoma

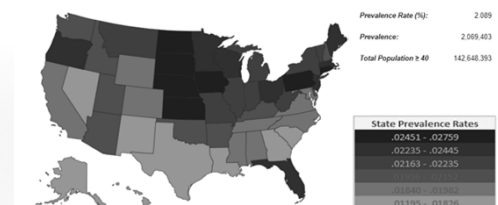
- 2.7 million Americans
- 2 out of every 100 adults over 40 years old

Klein R, et al. Arch Ophthalmology. 2011;129(1):75-80. Eye Disease Prevalence Research Group. Arch Ophthalmology. 2004;122(4):532-538. Eye Disease Prevalence Research Group. Arch Ophthalmology. 2004;122(4):552-563. 2010 United States Census

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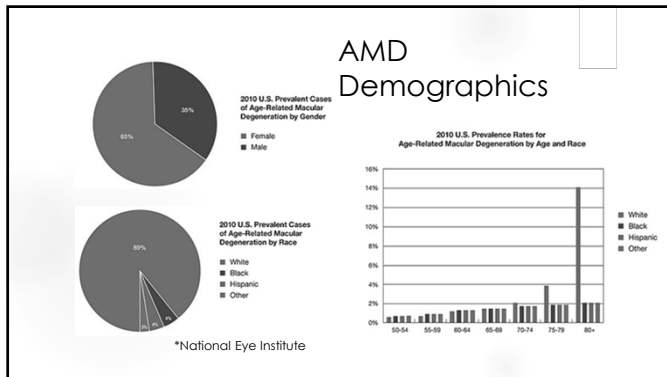
AMD Prevalence

Age-related Macular Degeneration Prevalence Rates by State

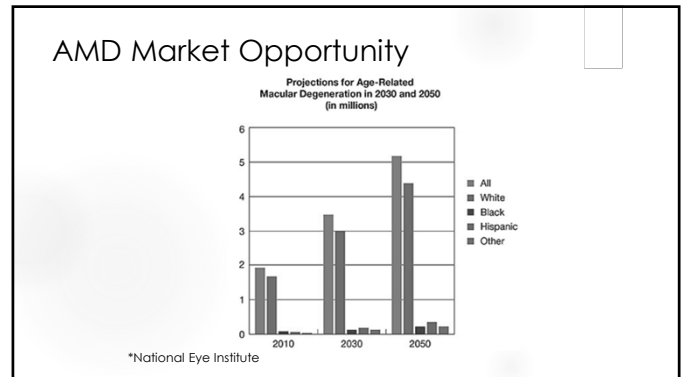


*Prevent Blindness America

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Poor vision from late detection can lead to physical injury

54% of patients experienced a fall
30% experienced more than one

35% of patients collided with an object
36% had a laceration

With late detection and poor vision come increased risk of physical injury; falls and vision injuries further limit the quality of life for AMD patients.

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Poor vision from late wet AMD detection may increase depression and anxiety

40% of AMD patients are affected by depression because of poor vision

10%-30% of AMD patients are affected by anxiety because of poor vision

Poor vision from late wet AMD detection can lead to functional disability and subsequent depression and anxiety in AMD patients.

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Could you live with 20/80?

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What do we know?

Patients who start with poor vision do not catch up¹

20/80 mean VA*
*Per IRIS Registry analysis.

34% of patients are $\geq 20/40$ at initiation of anti-VEGF treatment¹

Poor vision increases risk of physical injury, depression, and anxiety^{2,3}

VA less than 20/80 can limit:

- Driving
- Reading
- Independence

1. Rumpaklis, J. "The AMD Center of Excellence." ADA Annual Meeting 2014.
2. Rumpaklis, J. "The AMD Center of Excellence." ADA Annual Meeting 2014.
3. Rumpaklis, J. "The AMD Center of Excellence." ADA Annual Meeting 2014.

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BCVA and Function May Not Correlate^{1,2}

Facial Visual Field

Fovea

Foveal-Sparing Lesion

BCVA is often a poor indicator of visual dysfunction and can underrepresent a patient's deficit

1. Sumner, D., et al. "The Impact of BCVA on Quality of Life in AMD." JAMA Ophthalmol 2008;126:1079-85.
2. Sumner, D., et al. "The Impact of BCVA on Quality of Life in AMD." JAMA Ophthalmol 2008;126:1079-85.

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How AMD Diagnosis Changes Your Practice

Good for your patients

- If AMD is detected early, there are effective interventions that can preserve vision and improve quality of life

Good for your practice

- An AMD patient is estimated to add from \$350 to \$600 per year to practice revenue
- Based upon prevalence, AMD revenue should be 3X glaucoma revenue

Rumpaklis, J. Optometric Management. Jul 1, 2013.
Rumpaklis, J. "The AMD Center of Excellence." ADA Annual Meeting 2014.

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What is used to Dx AMD or gauge risk?

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"Am I at risk?"

- ▶ Biggest risk factor is age....
- ▶ Genetics and other non-modifiable factors like gender
- ▶ Modifiable risk factor:
 - ▶ Biggest one is SMOKING!!!
 - ▶ Also relevant are lifestyle, obesity, diet, sun exposure
 - ▶ Mostly things that PCP would discuss related to general health

Age-Related Macular Degeneration

REDUCE RISK

- Get a healthy diet including leafy greens, fish, and antioxidants
- Avoid smoking
- Maintain normal blood pressure & cholesterol
- Exercise regularly

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SMOKING is a HUGE RISK Factor

Beaver Creek, Blue Mountains, Rotterdam

increases and... 6 to... or 5% at 5... ers

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Genetic Factors and Risk: More than additive!

- ▶ Former Smokers: 1.29x
- ▶ Current Smokers: 2.4X
- ▶ Non-Smoker and CFH,Y402H: 7.6X
- ▶ Current smoker and CFH,Y420H: **34X**

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Genes add Predictive Power

AUC – ROC 'C' Statistic Scores (AREDS 2 &3)

1. Toss a Coin = 0.5 (Baseline)
2. Eye Exam + Age = 0.732 (+46.4%)
3. Eye Exam + Age + BMI + Smoking = 0.757 (+10.7%)
4. Add Genetics = 0.8221 (+24.9%)



Genetic Testing adds 24.9% improvement
 $0.821 - 0.757 / (0.757 - 0.5) * 100 = 24.9\%$

J. M. Seddon, B. Rosner et al; IOVS May 2009

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AMD is a genetic disease with known markers
 accounting for at least 70% of the population
 attributable risk

**In other words: AMD is >70% due to
 genetics!**

J.M. Seddon, B Rosner et al; IOVS May 2009

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Family history

- ▶ Are patients generally good historians as to specific eye diseases?
- ▶ For many patients cataracts = glaucoma = AMD
- ▶ OR WORST OF ALL: THE DREADED STIGMATISMAS!
- ▶ How to differentiate between
 - ▶ Cataracts: Surgery fixed
 - ▶ Glaucoma: Drops every day
 - ▶ AMD: Shots in the eye



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Can you do genetic testing

- ▶ It's as easy as a cheek swab!



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Raging debate

- ▶ The big debate in pharmacogenetics in AMD is "Does it matter" and if so, who gets what?
- ▶ Several published papers:
 - ▶ Awh et al: Genetics is EVERYTHING
 - ▶ Chew et al: Genetics means NOTHING
 - ▶ Seddon: Genetics means something
 - ▶ Most recent: somewhat neutral: Genetics is critical

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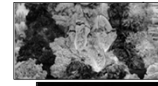
Macular pigment

- ▶ Measured by heterochromic flicker photometry
- ▶ It is a risk factor for AMD (among other things)
- ▶ Easily measured in 1-2 minutes
- ▶ Affected by carotenoids
 - ▶ 3 carotenoids found in macula
 - ▶ 2 carotenoids in diet (in meaningful amounts)
 - ▶ Lutein and Zeaxanthin

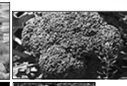
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Realistic Dietary Sources of

Romaine
lettuce
2.3 mg



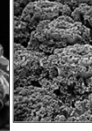
Broccoli
1.7 mg



Spinach
12 mg



Kale
40 mg



L/Z values based on a 100 g serving

U.S. Department of Agriculture, Agricultural Research Service. 2010. USDA National Nutrient Database for Standard Reference, Release 23. Nutrient Data Laboratory Home Page, <http://www.ars.usda.gov/ba/bhnrc/ndl>

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Heterochromic flicker photometry

Left Peripheral
Fixation target



Centre Flickering
Target



Right Peripheral
Fixation target



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Looking into the instrument..

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How can we make it "easy" to talk about MPOD and AMD lifestyle

- ▶ The recommendations on how to prevent or try to "control" AMD are no different than what a cardiologist or internist would recommend
- ▶ Cognitive Function is important to everybody and improved MPOD is correlated with
 - ▶ Higher plasma L/Z equaled better cognition, memory and executive function, and higher Z improved processing speed¹
 - ▶ Higher MPOD = better memory, faster reaction times, faster at tasks²

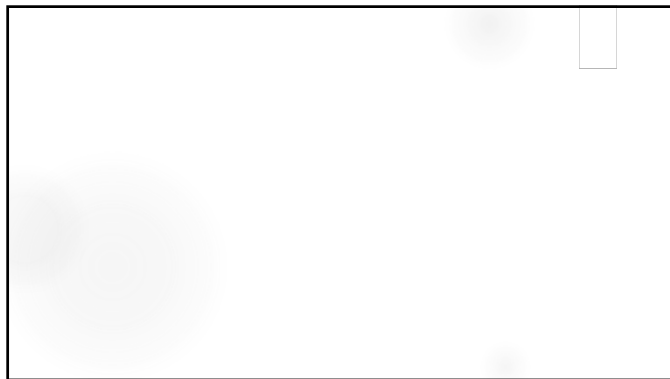
1. Feeney et al. Plasma L/Z and Cognition. J Gerontol A Biol Sci Med, 2017, Vol 00 no 00 1-6. 2. Feeney et al. MPOD and cognition. Neurobiology of

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Can you detect AMD before you can see it?

- ▶ Analogy to pre-perimetric glaucoma
- ▶ Dark adaptation finds first signs of abnormal metabolic transport caused by deposits "clogging" bruch's membrane and nutritional transport

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Dark adaptation has changed how I practice

- ▶ Likely the first (unrealized) symptom of AMD
 - ▶ "I don't like to drive at night anymore"
- ▶ I do it on all patients over age 60
- ▶ If fail screening, return for extended testing
- ▶ Discussion of pre-emptive measures to take and back to taking care of self.....

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How does the conversation go...

- ▶ Grateful and unapologetic
- ▶ Realistic and hopeful
- ▶ Honest and positive
- ▶ Proactive
- ▶ Engaging: Ask for questions

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Messaging to patient with AMD

- ▶ "What I am going to tell you is really no different than if you were to go to your PCP and ask them what to do to be/stay healthy"



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Reality....



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What is photography like for your patient

- ▶ Take your phone out of your pocket
- ▶ Turn on the flashlight function
- ▶ Close your eyes
- ▶ Hold the light right in front of your eyes (IF YOU SEE THIS YOU ARE NOT PLAYING ALONG)
- ▶ Open quickly and look right into the light
- ▶ NOTE: We know that if AMD, then impaired dark adaptation, so "blinded by the light".....do you think they can see the picture you show them to educate them?

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We all order OCT's for our patients..

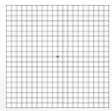
- ▶ Looking for any breaks in Bruch's membrane
- ▶ Looking for any fluid: Sub-RPE or sub-retinal
- ▶ Thickening
- ▶ But have you looked into the OCT?

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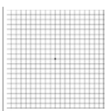
OCT from a patient's perspective

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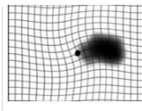
Amsler Grid



Normal Amsler



"Abnormal" Amsler
May have CNVM but
performed incorrectly



Abnormal Amsler

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Clinical Symptoms

Marley was dead: to begin with. There is no doubt about that. The register of his burial was signed by the clergyman, the clerk, the undertaker, and the parish council. It is of no use to the dead; it is only the signpost for the living. And Scrooge's name was good upon 'Change, for it was a name which did good.

Old Marley was as dead as a door-nail.

Mind! I don't mean to say that I know of my friend's death; for he is naturally dead about a door-nail. I might have been inclined, perhaps, to say that he was a dead piece of ironmongery in the trade. But the wisdom of saying 'he is dead' is similar; and my unhallowed hands shall not disturb it, or the Country's done for. You will therefore permit me to repeat emphatically, that Marley was as dead as a door-nail.

Patients with early AMD usually do not notice any changes in their vision.

Patients with advanced, or "wet" AMD often notice distortions, blurriness and dark areas in their visual field.

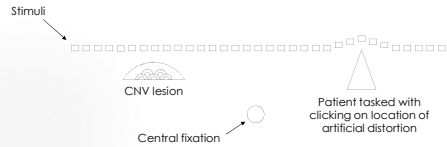
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Preferential Hyperacuity Perimetry delivers accurate, highly sensitive, specific disease detection



When the distortion caused by CNV is larger than the artificial distortion, the patient will preferentially pick this spot of pathological distortion.

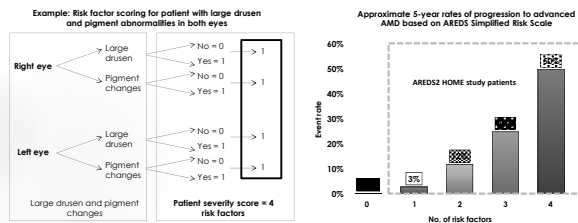
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Clinical Risk Factors: Per Blue Mountains Eye Study

- ▶ Large Drusen and Pigmentary change are most predictive for late AMD
- ▶ No large drusen or pigmentary changes: <1% of advanced AMD in 5 yrs
- ▶ Large Drusen and pigmentary changes: >50% of advanced AMD
- ▶ Those in highest tertile of L/Z: approx 1mg/d had 65% reduced incident Neovasc. AMD
- ▶ African Americans are not at as high of risk as caucasians

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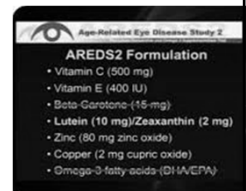
The "conversion" patient pool risk of progression by AREDS simplified risk score



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What did AREDS 2 tell us (abridged version)?

- ▶ Addition of L/Z "helpful"
- ▶ Reduction of Zinc "not helpful"
- ▶ Omega 3 "not helpful"
- ▶ Beta-Carotene not helpful
- ▶ MesoZeaxanthin was not tested
- ▶ Bottom line; about 67% still convert regardless of intervention....



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To make sure at least address...

- ▶ What is the treatment for wet AMD??



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The fastest injection I've seen..

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A more realistic patient experience

- ▶ No draping: sometimes used
- ▶ No speculum: often used

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Low Vision options

Traditional bioptic



Function for those with POOR vision:
Used for AMD in Australia



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OrCam

- ▶ "reader" that can be connected to most frames
- ▶ Reads words on boxes, pages, signs
- ▶ Has ability to recognize specified items (money, products, faces...)
- ▶ Based on technology used to create driverless cars



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Thank You!

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