Optometric Education Consultants

Integrative and Functional Medicine

New Opportunities for Optometry

Greg Caldwell, OD, FAAO

Sunshine State Summer Conference
Optometric Education Consultants
Friday, June 16, 2023

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Disclosures- Greg Caldwell, OD, FAAO

All relevant relationships have been mitigated

- Lectured for: Alcon, Allergan, Aerie, B&L, BioTissue, Kala, Optovue, RVL, Heru, Santen
  - Received honoraria
- Advisory Board: Allergan, Alcon, Dompe, Eyenovia Tarsus, Visus
- I have no direct financial or proprietary interest in any companies, products or services mentioned in this presentation
  - Disclosure: Non-salaried financial affiliation with Pharmanex
- Envolve: PA Medical Director, Credential Committee
- Healthcare Registries – Chairman of Advisory Council for Diabetes and AMD
- The content of this activity was prepared independently by me - Dr. Caldwell
- The content and format of this course is presented without commercial bias and does not claim superiority of any commercial product or service
- Optometric Education Consultants – Pittsburgh, PA, Sarasota, FL, Muncie, IN, Scottsdale/Phoenix, AZ, Orlando, FL, Mackinac Island, MI, Nashville, TN, and Quebec City, Canada - Owner

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Thank You Dr. Richer

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Ocular Disease Career

- OCT - Spectral domain
- OCT Angiography
- Visual Fields
- AMD, glaucoma, retinal degenerations, diabetic retinopathy
- Dark Adaptation

- Focusing on structure and function loss or damage

- Patients asking what about supplements
  - Reading about it on internet
- Promised I would do my due diligence
- Ocular disease optometrist to an Integrative Optometrist

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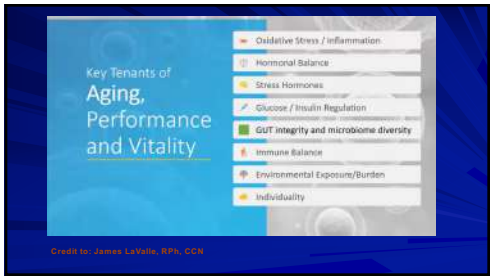

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Patients Are Expecting

- Early detection
- Wellness
- Prevention

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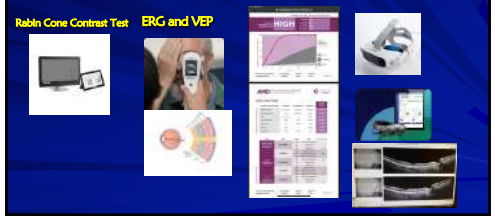
Early Detection and Allopathic Treatments



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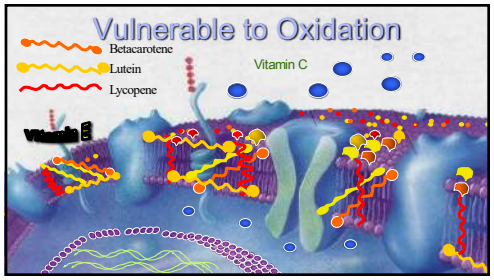

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Comprehensive Antioxidant Support

- Cell membrane support
- Immune support
- Support to the oxidative stress to the extracellular matrix
- Support to cell signaling

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Question?

- Who in here would consider themselves as an integrative optometrist?
- Who has done or recommended?
  - Supplements, vitamins, AREDS2
  - Omegas, EPA, DHA
  - Vital tears – ASED
  - Regener-Eyes
  - Amniotic membranes
  - CBD
  - Probiotics

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Allopathic vs Integrative Medicine

- "Allopathic medicine" is a term used for modern or mainstream medicine
  - Conventional medicine, mainstream medicine, Western medicine, biomedicine
  - Treating conditions and symptoms with its "opposite"
  - Health system in which medical doctors, nurses, pharmacists, and other healthcare professionals are licensed to practice and treat symptoms and diseases
  - Using medication, surgery, radiation, therapies, and procedures
- Complementary and integrative medicine are commonly used along with mainstream medicine
  - Homeopathy, naturopathy, chiropractic care, Chinese medicine
- Allopathic or modern medical schools have recently added more study and information on how food and nutrition can help prevent and treat disease
  - More education is being offered on integrative approaches and potential interactions with mainstream medicine

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Medical Practices

- Allopathic medicine
  - Western medicine
- Alternative "homeopathic"
- Functional
  - Medicine of why, treat the cause
- Integrative medicine
  - Complementary medicine - Eastern complimenting Western

What is integrative medicine?

The practice of integrative medicine refers to the **blending of conventional and evidence-based natural and complementary medicines and/or therapies with lifestyle interventions** to deliver holistic, patient-centred care.

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Chronic and Low-Grade Inflammation

Science has proven that chronic, low-grade inflammation can turn into a silent killer that contributes to cardiovascular disease, cancer, type 2 diabetes, diabetic retinopathy, cataracts, macular degeneration, and many other conditions

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Chronic and Low-Grade Inflammation

Like cancers and other slow-burn diseases, identifying these conditions early can make the difference between full recovery or a dramatically reduced quality of life or even death (vision loss or blindness)

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"Choose Your Parents Wisely"

- This just isn't as true as it's used to be
- Lifetime health
  - 8% genetics "Picking your parents wisely"
    - DNA in our nucleus
      - Can't be influenced
  - 92% epigenetics
    - Lifestyle choices = we can influence
    - Turn on/off gene expression

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Biomarker

- Test that has meaning
- Biological molecule found in blood, other body fluids, or tissues that is a sign of a normal or abnormal process, or of a condition or disease.
- A biomarker may be used to see how well the body responds to a treatment for a disease or condition
- Blood pressure, blood work, heart rate, genetic testing, IOP

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Predictive Biomarker

- Used to identify individuals who are more likely to respond to exposure to a particular medical product or environmental agent
- The response could be a symptomatic benefit, improved survival, or an adverse effect
- A value that we can guide therapy around
  - HbAlc
  - C-Reactive Protein
  - Plasma Homocysteine
  - Vitamin D (25-HydroxyD)
  - Omega 3 index
  - Carotenoid – measure of all antioxidants

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Biohacking

- The Art and Science of changing the environment around you and inside you so you have more control over your own biology.
- Somebody who uses science and technology to make his or her body function better and more efficiently – Dave Asprey

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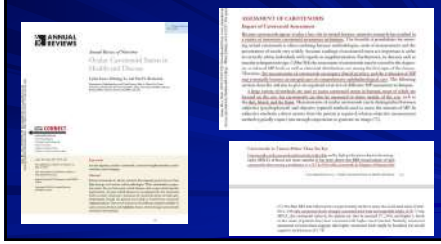
Measure?



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Chronic and Low-Grade Inflammation

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DNA Sciences

- Genomics = all of our genes
- Genetics = individual genes
- Epigenetics – the study of how our cells control gene activity without changing the DNA
  - Internal and external environments

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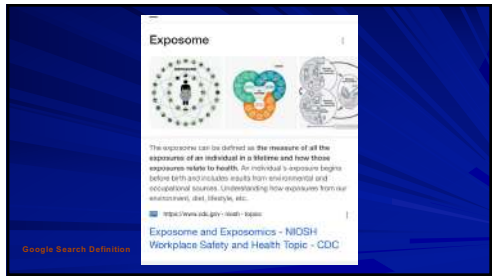

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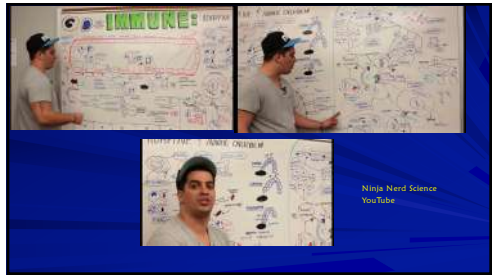

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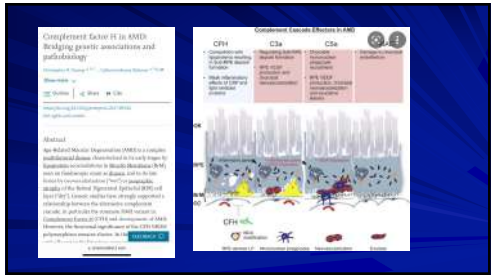

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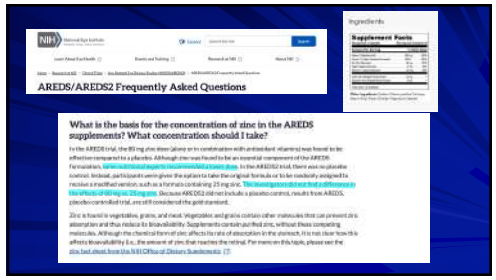

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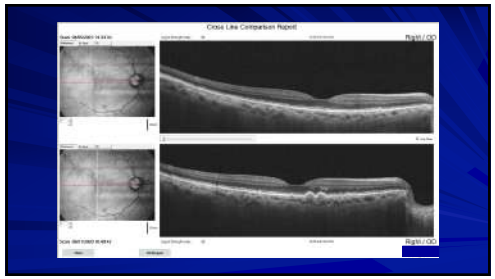

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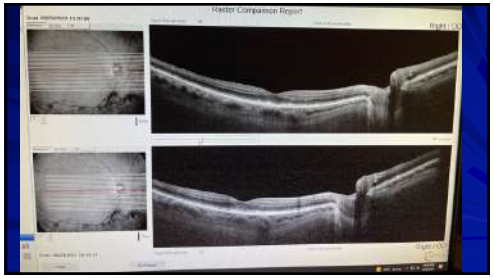

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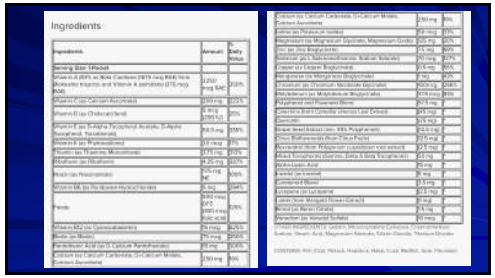

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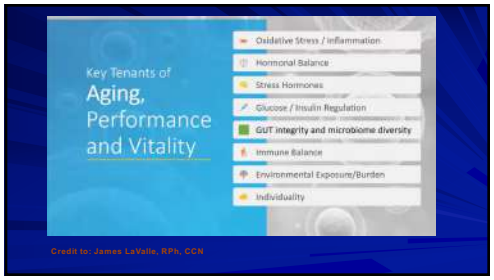

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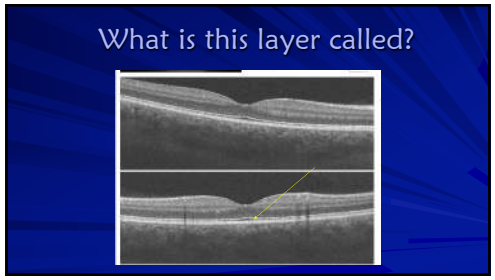

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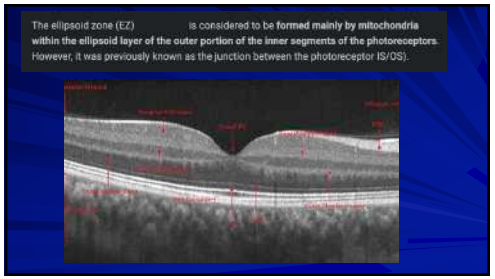

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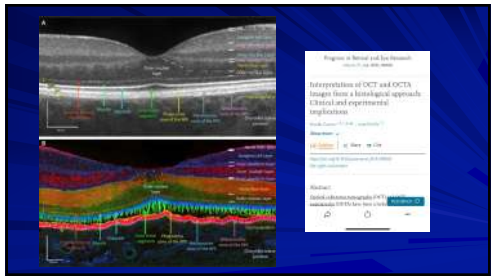

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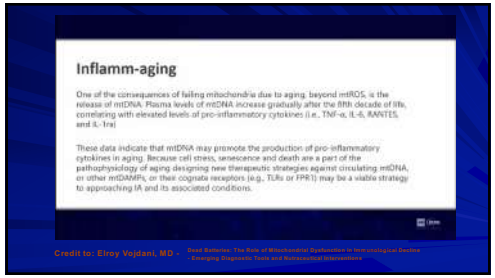

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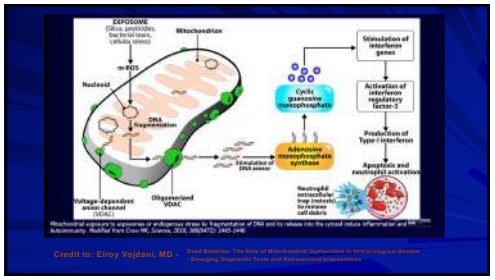

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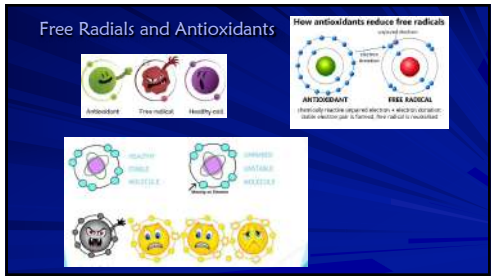

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Oxidative Stress

- Small percentage of oxygen is not completely reduced
- Accumulation of free radicals
- Oxidative damage
- Oxidative stress
- Considered the starting of several diseases
- Responsible for epigenetic alterations
- Mitochondria – vulnerable
- Not going to make this apple new again
  - Prevention is the one of the best medicines

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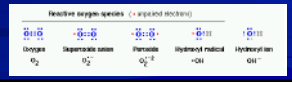
Free Radicals

- During metabolism the O_2 molecule splits and energy is released
  - Endogenous free radical formation
- Regain stability the free single oxygen atom (oxygen free radical) seeks and steals electrons from other molecules
  - Superoxide anion – will accept one electron
  - Peroxide – will accept two electrons
- These molecules can be proteins, lipids, and DNA
  - Proteins (enzymes) – kinases, phosphatases, and transcription factors



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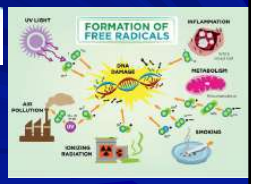
Endogenous and Exogenous Free Radial Formation



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Oh no

- Increasing exogenous free radicals
- Less antioxidant protection in our diet
- More bad and less good

Is an orange of the 1950's equivalent to 21 of today's oranges?

An orange from the 1950's was full of vitamin A, precious for our sight and our immune defenses. To attain the same amounts today, you would have to consume 21 of them. Onions and potatoes no longer contain any trace of it. The iron content in meat? Divided by 2. Calcium in broccoli? Divided by 4. To ingest the vitamin C contained in an apple from yesteryear, you would have to eat 100 today.

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The Equalizer

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October 23, 2021

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Nutritional Antioxidants

- Exogenous antioxidants
  - Tocopherols (E), ascorbic acid (C), carotenoids, ubiquinone, and polyphenols
- Well know antioxidants
  - Vitamin C, E, Beta-carotene, lutein, zeathanin, selenium, quercetin, and resveratrol
- Mechanisms of action;
  - Neutralize free radicals
  - Repair oxidized membranes
  - Decrease reactive oxygen species
  - Neutral reactive oxygen species

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Text me your answer 814-931-2030

Can our body manufacture these antioxidants? Vitamins A, C, and E, carotenoids, flavonoids, resveratrol, and quercetin

A. Yes
B. No
C. Hmmmm – I am not sure

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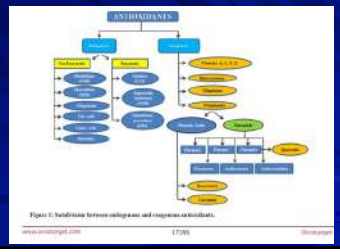
Endogenous and Exogenous Antioxidants



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Comprehensive Antioxidant Support

- Cell membrane support
- Immune support
- Support to the oxidative stress to the extracellular matrix
- Support to cell signaling

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Carotenoids

- Why do hear so much about carotenoids
- Melonie Clemmons, OD May 20, 2022 AACO Nashville

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Carotenoids

- Organic pigments produced by plants, algae, and bacteria
- Cannot be synthesized by the human body
  - Hydrophobic compounds
    - Important for the phospholipid bilayer
- 600 in nature – 50 human food chain – 15-20 human blood stream
- Macular carotenoids (L and Z) – highest concentration found in the human body
  - Diet derived
  - Henle fibers – between the inner and outer plexiform layers
  - Sequester or absorb blue light

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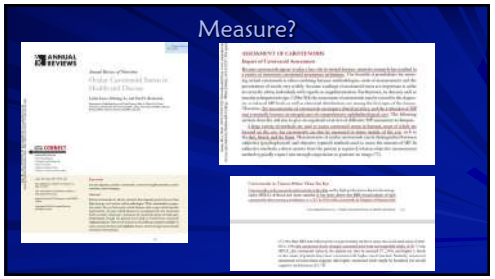

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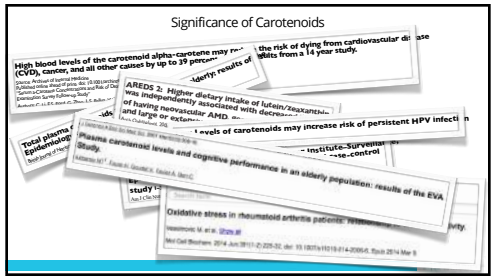

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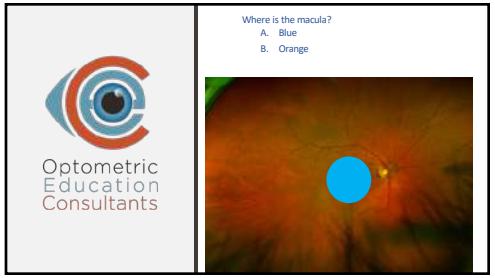

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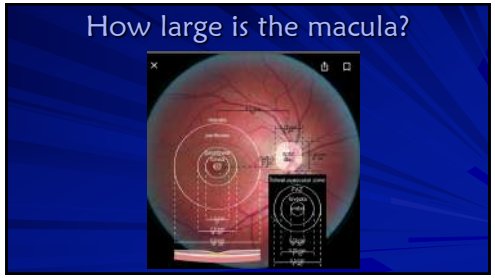

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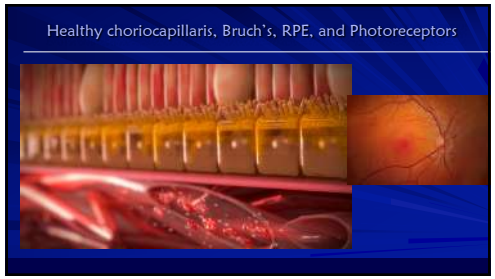

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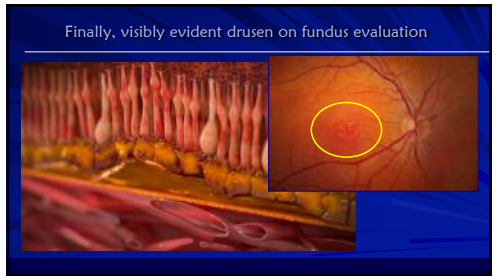

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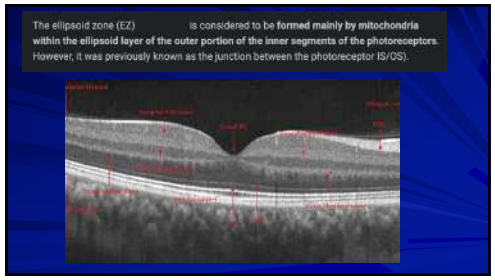

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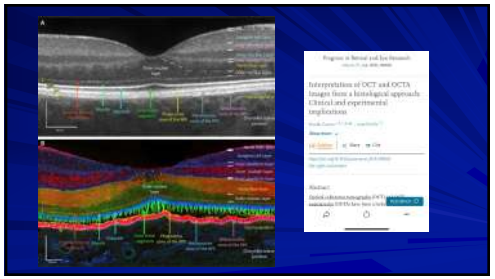

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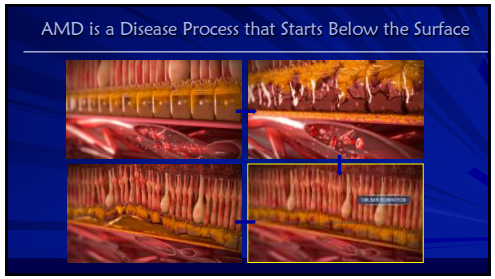

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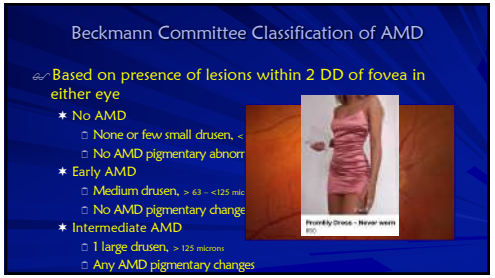

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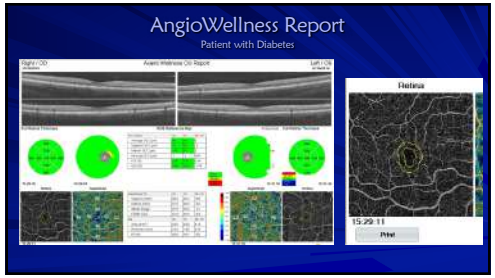

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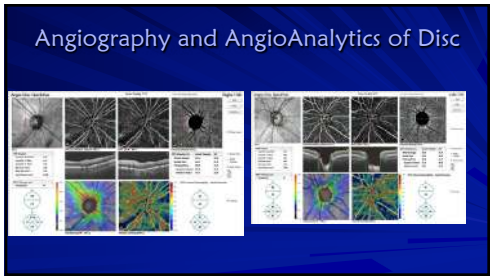

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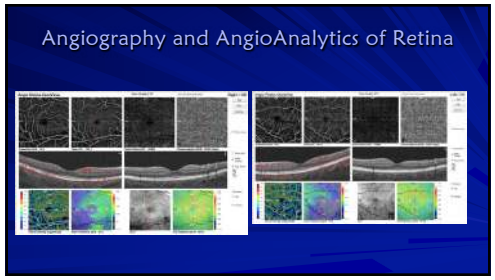

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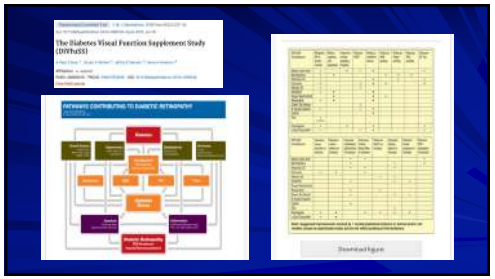

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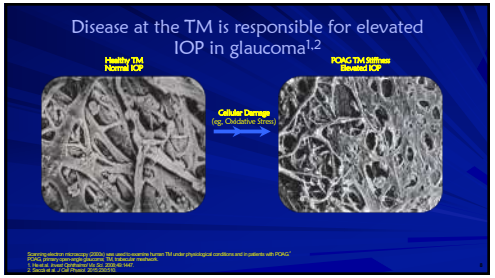

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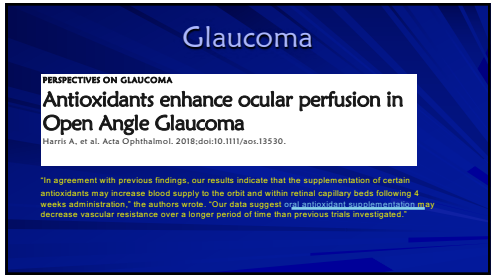

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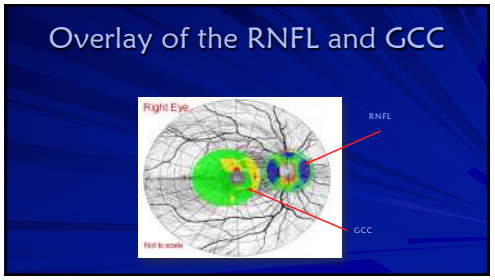

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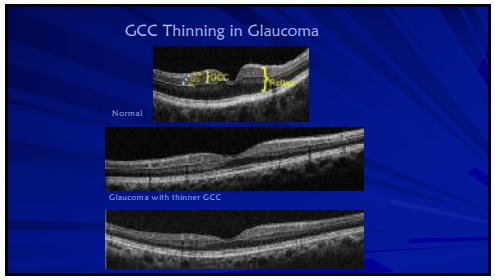

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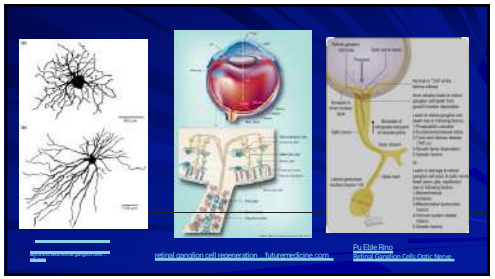

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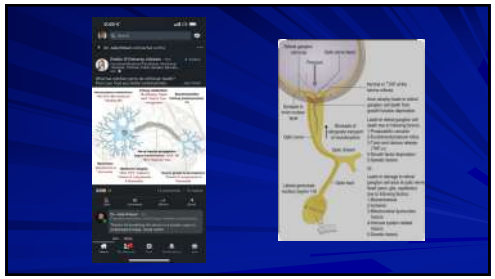

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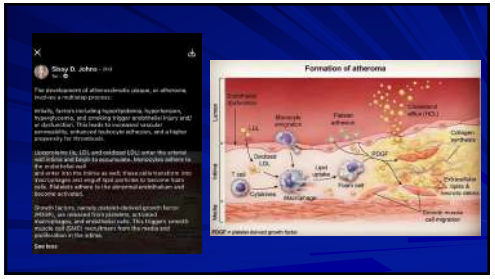

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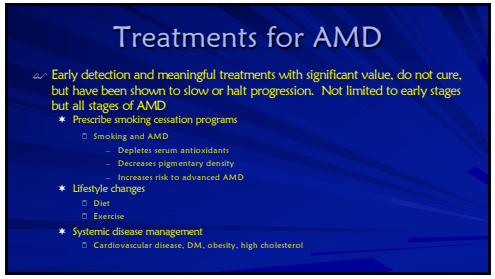

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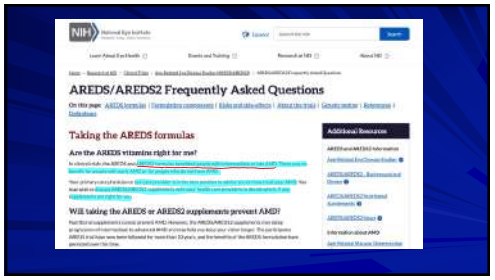

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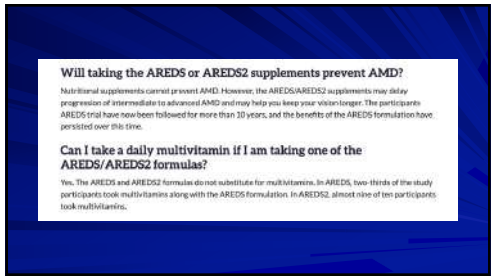

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Treatment for AMD

- Nutritional supplements
  - Sub-clinical/sub-structural or early disease
    - Controversy flourishes
      - No definitive guideline exists
      - Despite consensus evidence suggests using supplements
  - Intermediate – advance disease
    - No controversy on advocating for supplements
  - AREDS 1
    - Contains Beta-carotene and no lutein or zeaxanthin, no longer recommended
    - Investigated early AMD, no statistically significant benefit
  - AREDS 2
    - Recommended for intermediate and advanced AMD, study protocol
  - The Practical Guide for the Treatment of AMD - 3 primary options
    - Macular pigment supplement
      - Carotenoids: lutein, zeaxanthin, meso-zeaxanthin
    - Carotenoids, antioxidants, zinc, and vitamins C & E
      - AREDS 2
    - Carotenoid macular supplement in subclinical and early AMD. Carotenoid and antioxidant is intermediate and AMD that is progressing

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An Evening with Dr. Paul Bernstein

High Performance Liquid Chronography

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ARVO STUDY

Interrelationships between Macula, Skin and Serum Carotenoids- Paul Bernstein, Werner Gellerman et al ARVO May 2016

Conclusions:

"Our results emphasize the importance of measuring the total amount of carotenoids in the macula region using an objective image based modality such as AFI w Spectralis rather than subjective MPOD."

Skin resonance Raman Spectroscopy of skin carotenoids is a reasonable biomarker of macula carotenoid status, and correlates better than than subjective MPOD tests.

The objective hand scanner is better than the subjective Macuscope, QuantifEYE, and Densitometer for estimating macula pigment.

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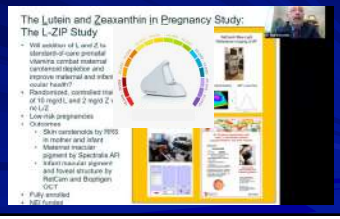
An Evening with Dr. Paul Bernstein



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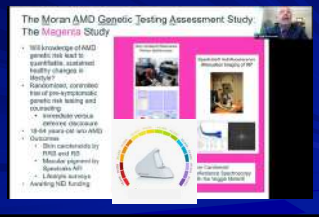
An Evening with Dr. Paul Bernstein



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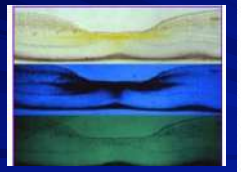
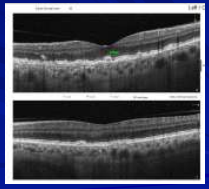
Macular Pigment





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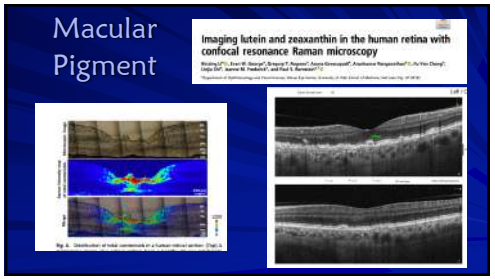

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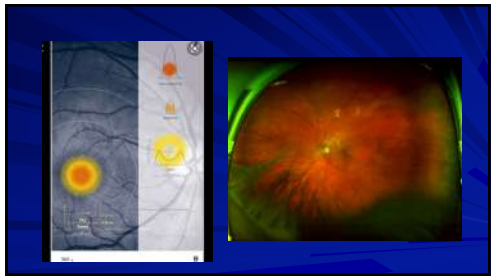

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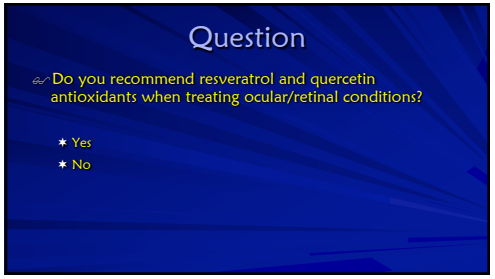

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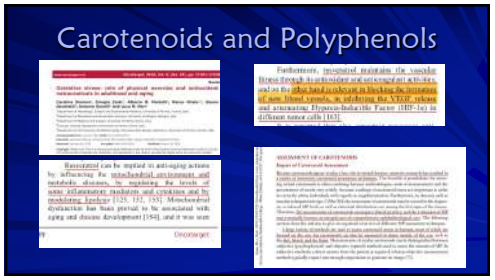

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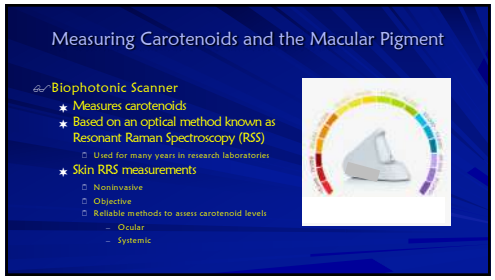

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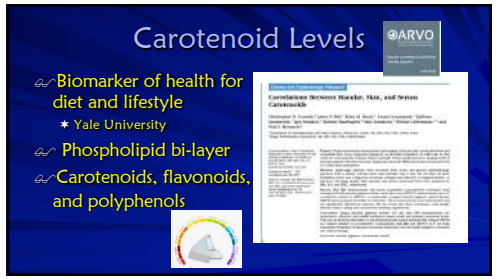

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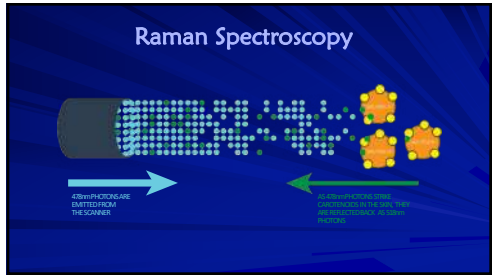

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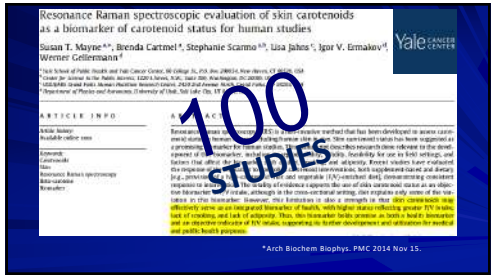

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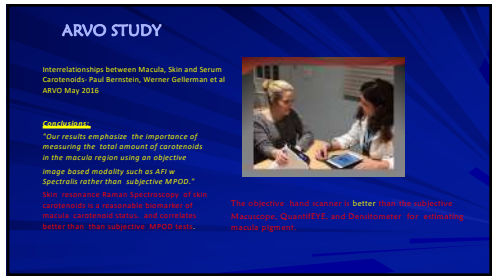

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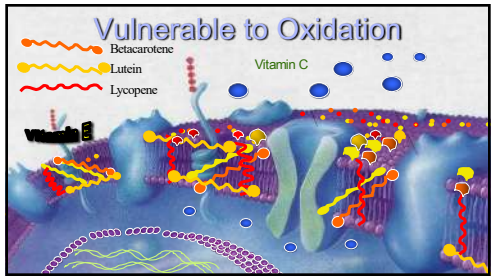

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Are you taking a supplement?

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53-year-old man

- Family history of AMD
  - Dad with 43 injections for AMD
- Pre-diabetic with borderline HbA1c
- Vision 20/20 OU
- DFE- retina clear
- OCT normal
- Passes dark adaptation

CONGRATULATIONS ON TAKING THE FIRST STEPS TOWARDS OPTIMIZING YOUR SCS

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Ingredients

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SUPPLEMENT FACTS

Supplement Facts

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53-year-old man

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CONGRATULATIONS ON TAKING THE FIRST STEPS TOWARDS OPTIMIZING YOUR SCS

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Master Comparison Report

N of 3
So Far

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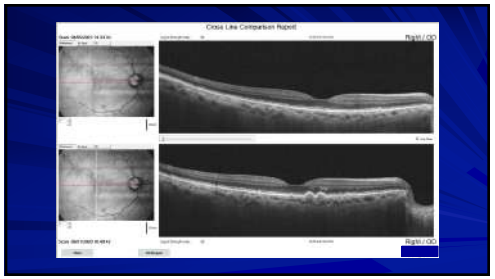

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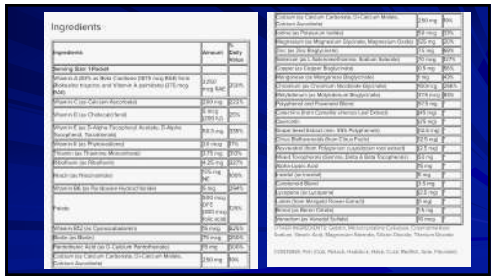

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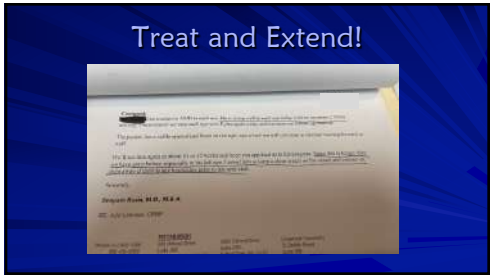

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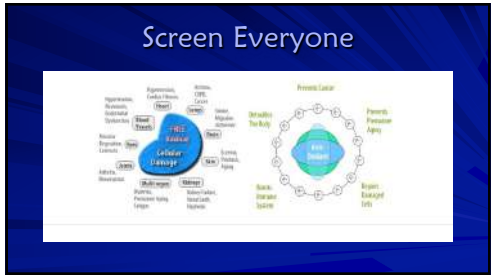

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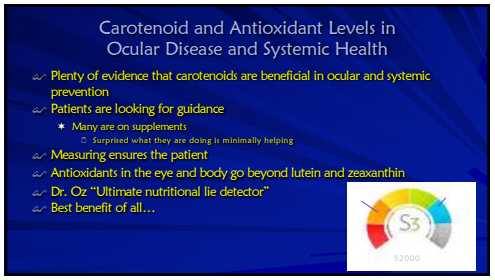

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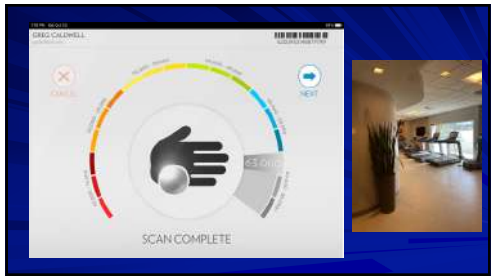

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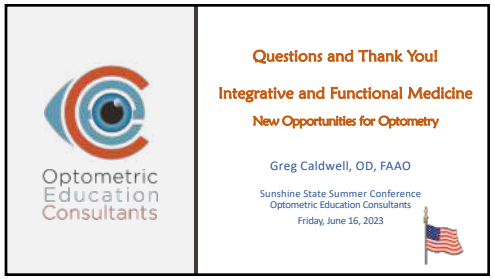
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