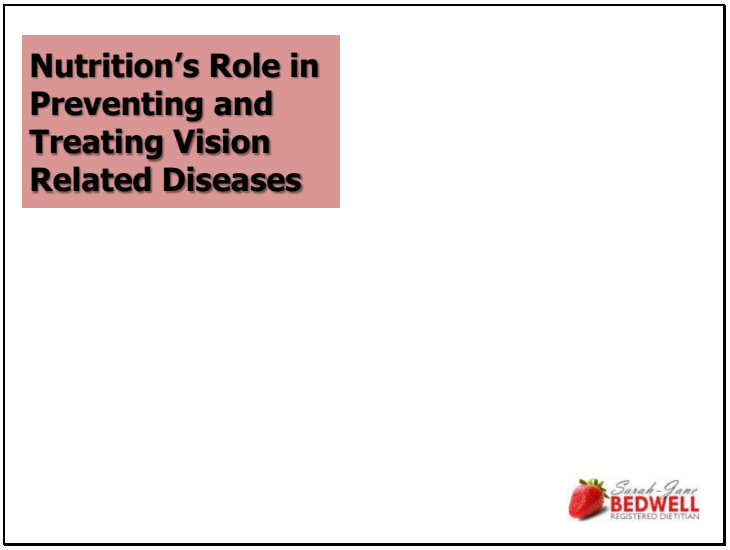
Slide 1


Nutrition's Role in Preventing and Treating Vision Related Diseases
Sarah-Jane
BEDWELL
REGISTERED DIETITIAN

Slide 2

Slide 3

Obesity equals Systemic Disease

- Systemic Disease Equals Eye Disease
  - Diabetic Retinopathy
  - Cataracts
  - AMD
  - Dry Eye Syndrome

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Slide 4

Systemic Disease and Eye Disease

- Blindness affects 1 in 28 over 40
- Diabetic Retinopathy affects half of Diabetics
- 80% of Blindness is avoidable with early detection
- AMD already causing 50% of Blindness
- Obesity indicated as risk factor now

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Slide 5

Medical Nutrition Therapy Can Help

- Integrative Optometry
- Nutritional evidence-based research
- Many patients prefer the use of natural, less invasive interventions
- Improve patient care and outcomes
- High-quality nutrition products and appropriate use

Slide 6

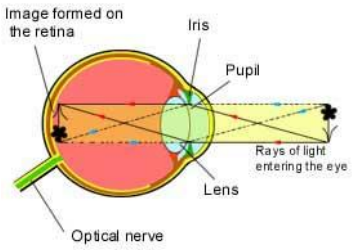
Vision Related Diseases Affected by Nutrition

- Macular Degeneration
- Cataracts
- Diabetic Retinopathy
- Glaucoma
- Dry Eyes

Slide 7

Macular Degeneration

- AMD is the leading cause of blindness in people age 55+
- Irreversible disease
- Leading cause of vision loss in the world
- Free radical damage to the delicate retinal tissue is permanent and cumulative over a lifetime



Slide 8

Macular Degeneration

Slide 9

AREDS' 1 Formulation

Slide 10

ARED-2 - advancing our understanding

- Randomized study of 4000 participants aged 55 to 80 who have large drusen or advanced AMD in one eye
- Participants will receive one of four supplements:
  - placebo
  - 10 mg of lutein along with 2 mg of zeaxanthin,
  - 1 g of DHA and EPA
  - combination of the lutein, zeaxanthin, DHA and EPA.
- All participants will be offered additional treatment with the original AREDS formulation and 3 variations of this formula.
  - (1) no beta-carotene
  - (2) lower amounts of zinc
  - (3) no beta-carotene and lower amounts of zinc

Slide 11

Cataracts

- Age-related eye disease
- No one knows exact cause
- Oxidative Stress
- Diabetes increases risk
- Use of steroids, diuretics, tranquilizers increases risk
- High salt consumption increases risk
- Other risk factors: smoking, air pollution, heavy alcohol consumption

Slide 12

MY Grandma

Slide 13

Cataract Treatment and Prevention

- Cataract surgery is very successful in restoring vision.
- Think Prevention as well: Studies have shown that a diet high in antioxidants and phytochemicals may prevent or delay cataract formation.
  - ✓ Beta-carotene (Vitamin A)
  - ✓ Selenium
  - ✓ Vitamin C
  - ✓ Vitamin E
  - ✓ Omega-3 Fatty Acids
  - ✓ Lutein and Zeaxanthin
  - ✓ Low sodium diet

Slide 14

Recent Research: Specific Nutrients May Prevent Cataracts

- diet high in carbohydrates may increase cataract risk
- foods rich in a variety of vitamins /minerals may help delay the development of cataracts
- higher intakes of or the combined intake of multiple antioxidants reduced the risk of cataracts

Slide 15

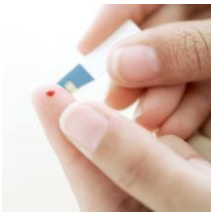
Diabetic Retinopathy

- Caused by uncontrolled diabetes
- High levels of glucose in the blood damage the eye
- Nonproliferative most common

Slide 16

Glaucoma

- 2.5 million Americans estimated to have Glaucoma
- It's the second leading cause of blindness.
- Uncontrolled Diabetes can increase risk



Slide 17

Prevent and Delay Complications

- Diet
- Exercise
- Check-ups
- Compliance with treatments

Slide 18

Medical Nutrition Therapy for Diabetes

- MNT for diabetes is key in preventing Diabetic Retinopathy.
- Encourage optometrist to refer to a Registered Dietitian
- Should be following a controlled carbohydrate diet, high in fiber for prevention.

Slide 19

Regular Check Ups

- Every 3 months: A1C, urine test, blood pressure, weight, foot exam
- Every 6 months: dental exam/cleaning
- Every Year: blood panel, kidney function tests, immunizations, eye exam

Slide 20

Diet Can Protect Us

Slide 21

Good Glucose Control

- Diabetes Control and Complications Trial
- Compliance with meds plus lifestyle
- Eye disease in only ¼ as many people
- Kidney disease in only ½ as many people
- Nerve damage in only 1/3 as many people
- Far fewer people who already had some complications got worse

Slide 22

Dry Eyes

- Over 10 million Americans
- Inflammatory condition of the ocular tissue
- Too many omega-6 fatty acids and not enough omega-3 fatty acids
- Supplements containing certain essential fatty acids can decrease dry eye symptoms.

Slide 23

Fish oil the Natural Solution for Dry Eyes

- Fish oil supports the body's natural anti-inflammatory response
- Women's Health Study (a cross sectional study of 32,470 women)
  - Women who consumed higher amounts of EPA and DHA had significant reduction in the occurrence of Dry Eye Syndrome (DES)

Relation between dietary n6 fatty acids and clinically diagnosed dry eye syndrome in women. *Am J Clin Nutr* 2005; 82:887-893.

Slide 24

Drinking Water

- Mild dehydration may make dry eye problems worse.
- Women need 91 ounces of water
- Men need about 125 ounces

Slide 25

Sources and Recommended Amounts of Key Nutrients for Preventing/Treating Specific Vision Related Diseases/Conditions

Slide 26

Essential Fatty Acids

- EFAs are not made by the human body, but required for proper function of all cells.
- The Omega-3 fats - EPA and DHA
  - attain their highest concentration in ocular tissue

Stillwell W et al, Chem Phys Lipids. 2003
Cordain L, AJCN 2005
Linus Pauling Institute, Corvallis OR 2006

Slide 27

Omega-3's improve overall eye health

- Fish Oil
  - Supports ocular development
  - Improves circulation
  - Anti-inflammatory response
  - Protect from free radical damage

Studer M, et al. Effect of Different Antilipidemic Agents and Diets on Mortality, A Systematic Review. Arch Interr 2005;165:725-730

Durrington P, et al. An omega-3 polyunsaturated fatty acid concentrate administered for one year decreased triglycerides in simvastatin treated patients with coronary heart disease. Heart 2001; 85(5):544-548.

Slide 28

Sources of Omega-3 fats

- Omega-3
  - Fish: EPA and DHA; oily cold-water fish such as sardines, anchovies & salmon (fish oil supplements)
  - Plant: Alpha linolenic acid (ALA); flaxseed oils and vegetable oils
    - *Conversion of ALA to EPA or DHA is limited in humans*
    - *Scientific evidence has determined that ALA is not a reliable source of EPA and DHA*
- Omega-6
  - Plant: Linoleic acid (LA); vegetable oils (soy, corn, sunflower, safflower)
  - Animal: Arachidonic acid (AA); eggs, dairy, and red meat

Slide 29

Styrofoam Test

Which form is best: **ethyl ester or re esterified triglyceride?**

Slide 30

Fish Oil is Safe

- Research shows that pure fish oil supplements are safe with generally no adverse effects.
- Purified fish oil supplements have significantly less impurities than fish.
- It is generally recommended to stop taking omega-3s one week before major surgeries.
- The FDA has ruled that up to 3 g of EPA + DHA is safe without fear of adverse events.

Slide 31

Fish Oil Quality Counts

- Choosing the right fish oil product for your patients is key
  - Burping/Fish smell due to rancid, poorly manufactured oil
  - Fish Oil can easily oxidize
  - Must process in an oxygen-free nitrogen environment
  - Molecular distillation – removes PCB's and mercury
  - Ask for third party testing results

Slide 32

Fish Oil Quality Standards are Voluntary

- **In the United States there are no required manufacturing standards.**

- **There are three voluntary guidelines for manufacturers to consider:**
  - Norwegian Medicinal Standards
  - European Pharmacopoeia
  - Council of Responsible Nutrition

Standards are related to limits for heavy metals, dioxins, PCBs and measurements of freshness.

Slide 33

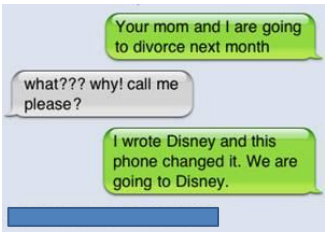
Third Party Testing

To verify quality product should be independently tested for :

- Purity - absence of environmental toxins
- Potency - fatty acid content verified
- Freshness - measurement of oxidation (rancidity)

Slide 34

Some Things Get Lost in Translation



Slide 35

Lutein and Zeaxanthin

- Lutein and zeaxanthin are compounds called xanthophylls, which are carotenoids related to beta-carotene.
- Give vegetables like carrots their orange color
- Found in large amounts in the lens and retina of our eyes

Slide 36

Sources of Lutein and Zeaxanthin

- Dark, green leafy vegetables
- Eggs also contain lutein in the yellow yokes.
- Yellow and orange fruits and vegetables
- 5-9 servings of colorful fruits and vegetables every day
- AREDS 2 still going on so no specific recommended amount yet

Slide 37

Vitamin A and Beta Carotene

- Vitamin A is an antioxidant that you can get from animal sources such as liver or butter, or from plants that contain carotenoids.
- Vitamin A deficiency is one of the leading causes of blindness in developing countries.
- Vitamin A has been reported to prevent cataracts from forming and may have a role in preventing blindness from macular degeneration.

Slide 38

How much Vitamin A is needed?

- The U.S. RDA for males age 11+ is 1,000 Retinol Equivalents (RE) = 6mg beta carotene
- RDA for females age 11+ is 800 RE.
- Smokers and drinkers should take in extra vitamin A
- AREDS 1: 15mg Vitamin A (as beta carotene)

Slide 39

Working Together

Slide 40

Vitamin C and Bioflavanoids

- Complementary Effect
- Help form and maintain connective tissue (collagen in cornea of the eye)
- Promote healthy bones, skin and blood vessels (delicate retina capillaries)
- Studies suggest long-term consumption may reduce the risk of forming a cataract and vision loss from macular degeneration.

Slide 41

Vitamin C and Bioflavonoids Working Together

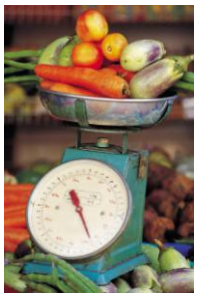
- Bioflavonoids and vitamin C appear to work together in the body.

- Some of these combined effects include:

✓ Reduced risk of heart disease
✓ Reduced risk of certain cancers
✓ Certain anti-aging effects
✓ Protection against infections
✓ Strengthened walls of blood vessels
✓ Improved blood circulation
✓ Decreased blood cholesterol
✓ Improved liver function.

Slide 42

How much Vitamin C and Bioflavonoids is Needed?



- RDA of vitamin C is 90mg per day for men and 75 mg for women.
- Research suggests smokers need more vitamin C than nonsmokers.
- Consume significantly more vitamin C than the RDA
- Safe at high doses
- Bioflavonoids : also safe at high doses.
- No RDA at this time.
- AREDS 1: 500mg Vit C

Slide 43

Sources of Vitamin C and Bioflavonoids

- Foods with the highest content of vitamin C are:

✓ Sweet red peppers (283 mg per one cup serving)
✓ Sweet green peppers (133 mg per one cup serving)
✓ Strawberries (86 mg per one cup serving)
✓ Broccoli (82 mg per one cup serving)
✓ Orange juice (75 mg per one cup serving)

- Almost any food containing vitamin C also contains bioflavonoids.

- Anthocyanins may help reduce the risk of cataracts and macular degeneration and help maintain the health of the cornea and blood vessels in various parts of the eye.

Slide 44

Vitamin E

- Antioxidant
- Possibly prevents cataracts/macular degeneration (AMD)
- AREDS found a 25% lower risk of developing advanced stages of AMD when a nutritional formula including vitamin E was taken.

Slide 45

How Much Vitamin E is Needed?

- The U.S. RDA for adults and children of ages 14 or older is 15 mg per day — the equivalent of 22.5 IU.
- Based on AREDS and other nutritional studies, recommend a daily multivitamin that contains up to 400 International Units (IU) of vitamin E in combination with other antioxidants as part of preventative eye care.
- Some studies indicate that high doses of vitamin E can cause problems such as increased bleeding.
- AREDS 1: 400 IU's

Slide 46

Minerals That Help The Body Absorb Antioxidants

- Selenium: Seafood (shrimp, crab, salmon, halibut); Brazil nuts; enriched noodles; brown rice.
  - RDA: 55 mcg for teens and adults (60 mcg for women during pregnancy and 70 mcg when breast-feeding).
- Zinc: Oysters; beef, Dungeness crab, turkey (dark meat), wheat, nuts.
  - RDA: 11 mg for men; 8 mg for women
- AREDS 1: 80 mg of zinc as zinc oxide/2 mg copper as cupric oxide

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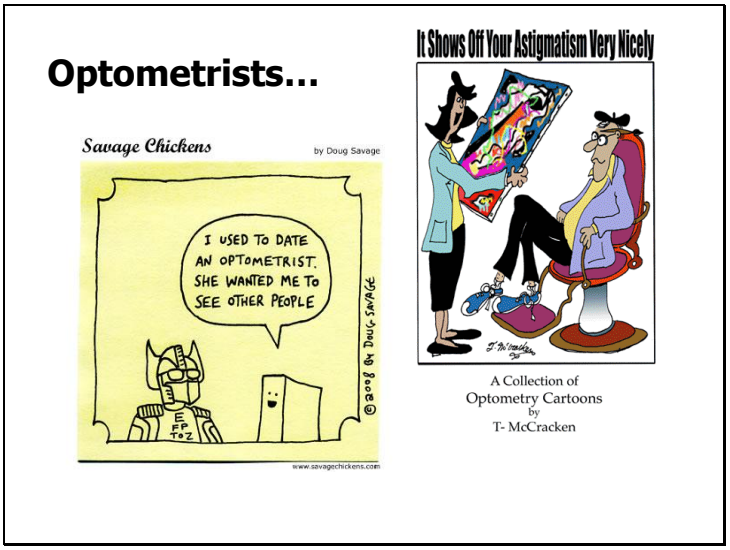
Optometrists…
Savage Chickens
by Doug Savage
I USED TO DATE AN OPTOMETRIST. SHE WANTED ME TO SEE OTHER PEOPLE
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It Shows Off Your Astigmatism Very Nicely
A Collection of
Optometry Cartoons
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Optometrists as a Referral Source

- Volunteer to speak at local or state optometry associations on nutrition and vision
- Ask your optometrist, if he/she currently recommends nutraceuticals or nutrition counseling
- Send letters to your current clients' optometrists
- Offer consulting to help Optometrists:
- identify a high quality product
  - Great taste is key to patient compliance
  - Patient education material
- Establish Protocols
- Stock Product

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Slide 49

What you should tell your patients - prevention starts today

- We won't know the results of AREDS II for a number of years.
- In the meantime, it makes good sense to recommend to patients:
  - Eat a diet rich in fruits and vegetables for antioxidant nutrients, especially dark green leafy veggies which are good sources of lutein
  - Eat fish at least 2-3 times weekly for their omega-3 fats.
- Recommend supplements as needed

Slide 50

Tips When Buying Supplements

- Check for an expiration date
- Make sure the seal on the bottle has not been broken
- Check the serving size
- Capsules often are better than hard tablets
- Best bioavailability
- Avoid fillers

Slide 51

Styrofoam Test Results

Which one was which: **ethyl ester or re esterified triglyceride?**

Slide 52

Precautions When Taking Eye Supplements

- Pregnant or nursing or are taking blood thinners (anti-coagulants)
- Dosage
- About Prevention-not a magic pill

Slide 53

Summary

- Omega-3 Fatty Acids: Protect against AMD, Cataracts. Treat DES. (Supplements)
- Lutein and Zeaxanthin: Protect against AMD, Cataracts. Treats light sensitivity. (diet; possibly supplements)
- Beta-Carotene (Vit A): Protect against AMD, Cataracts. (diet; no supplements for smokers)

Slide 54

Summary Continued

- Vit C and Bioflavonoids: Promotes overall eye health; Protects against AMD, Cataracts, Retinopathy/Glaucoma (diet)
- Vit E: Protects against AMD, Cataracts (diet: possibly supplements)
- Zinc: Protects against AMD (diet: careful with high dose supplements)

Slide 55

Questions?

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