AREDS: Age Related Disease Studies & Nutritional Support For Healthy Eyes

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Your Presenter

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• With NSP since 1982, instructor since 2003
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AREDS: Age-Related Eye Disease Studies

• Major clinical trial sponsored by the National Eye Institute, one of the federal government’s National Institutes of Health
• Results showed that high levels of antioxidants, and vitamins and minerals can significantly reduce the risk of developing advanced age-related macular degeneration

https://nei.nih.gov/amd

Randomized, Placebo-Controlled Clinical Trial

• Involved 4,757 participants, 55-80 years of age, in 11 clinical centers nationwide
• Scientists found that people at high risk of developing advanced stages of AMD lowered their risk by approximately 25%

https://nei.nih.gov/amd
Age-Related Macular Degeneration

“These nutrients will delay the progression to advanced AMD in people who are at high risk, those with intermediate AMD in one or both eyes, or those with advanced AMD in one eye already”

– Paul Sieving, MD, PhD, and director of NEI

Vision Problems Increases with Age

• Approximately 1.7 million Americans have some form of AMD, and approximately 100,000 are blind from the disease
• NEI estimates there are 1.5 million surgeries for cataract each year in the U.S.
• The frequency of both diseases increases dramatically after age 65

Age-Related Macular Degeneration Progression

- In some people AMD advances so slowly that vision loss does not occur for a long time
- In others the disease progresses faster and may lead to a loss of vision in one or both eyes
- As AMD progresses, a blurred area near the center of vision is a common symptom, and over time the blurred area may grow larger or one may develop blank spots in their central vision

What Is AMD?

- Common eye condition that causes damage to the macula -- a small spot near the center of the retina and the part of the eye that is needed for sharp, central vision that allows us to see objects straight ahead
Wet and Dry Macular Degeneration

• About 90% of all people have “dry” AMD, a condition in which layers of the macula get progressively thinner, functioning less and less as they do
• 10% have “wet” AMD, a condition where new blood vessels grow behind the retina and leak fluids causing scar tissue to form, and retinal cells to stop functioning

Risk Factors for AMD Include:

• Older age, race, family history of AMD
• Eye characteristics such as farsightedness, and light-colored eyes
• Cardiovascular disease (including hypertension), smoking, and environmental toxins
Cataract Facts

• The lens (made up of mostly water and protein) lies behind the iris and the pupil, working much like a camera lens
• As we age, some of the protein may clump together and start to cloud a small area of the lens
• Over time the cataract may grow larger and cloud more of the lens, making it harder to see

Risk Factors for Cataract Include:

• Older age, gender, heredity
• Light-colored eyes
• Diabetes, hypertension, steroid medications, trauma, smoking, and sunlight exposure
AREDS-Based Formulas

- May delay progression of advanced AMD and help to maintain vision in intermediate AMD or advanced AMD in one eye
- Participants in the first AREDS trial have now been followed for over a decade, and the benefits of AREDS-based formulations have persisted over time

Nutrients Difficult to Achieve in Diet Alone

- Previous studies have suggested that people who have diets rich in green, leafy vegetables have a lower risk of developing AMD
- “However, the high levels of nutrients that were evaluated in the AREDS are very difficult to achieve from diet alone”
  - Frederick Ferris, MD, director of clinical research at the NEI, and chairman of the AREDS
What Does an AREDS-Based Nutrient Formula Look Like?

- Beta Carotene
- Vitamin C
- Zinc
- Selenium
- Copper
- Lutein
- Zeaxanthin
- Turmeric Root
- Lycopene
- Green Tea
- Bilberry Fruit
- Grape Seed
- Olive Leaf
- Chlorophyll

**Beta-Carotene**

- In the body, beta-carotene converts into vitamin A (retinol)
- We need vitamin A for good vision and eye health
- However, too much beta-carotene can be dangerous for people who smoke or those exposed to asbestos

https://www.umm.edu/health/medical/altmed/supplement/betacarotene
Vitamin C

• Needed for the growth and repair of tissues in all parts of your body
• It is an antioxidant, along with vitamin E, beta-carotene, and many other plant-based nutrients

Zinc

• An essential trace mineral with antioxidant properties
• Next to iron, zinc is the most common mineral in the body, and is found in every cell
• Zinc reduces the amount of copper your body absorbs, so high doses of zinc can cause a copper deficiency
Selenium

• An essential mineral that works as an antioxidant; it is found in small amounts in the body
• You may have low levels of selenium if you:
  • Smoke cigarettes
  • Drink alcohol
  • Take birth control pills
  • Have a condition that prevents your body from absorbing nutrients, such as inflammatory bowel disorders

https://www.umm.edu/health/medical/altmed/supplement/selenium

Copper

• Copper is a mineral found throughout the body that helps make red blood cells and keeps nerve cells and the immune system healthy
• Copper acts as an antioxidant
• People who take high amounts of zinc or vitamin C need more copper

https://www.umm.edu/health/medical/altmed/supplement/copper
Phytonutrients

- *Carotenoids* – produces yellow, red, and orange colors in plants
- *Lycopene* – produces pink or red color in plants
- *Lutein* – produces a deep yellow color, as in egg yolks
- *Flavonoids* – a very large class of pigments

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Phytonutrients

- Apple, green tea leaf – *flavonols, polyphenols, lignans*
- Carrot root- *carotenoids*
- Tomato – *lycopene, lignans*
- Olive leaf, turmeric - polyphenols
- Grape Seed – *lycopene, flavonols*
Lutein and Zeaxanthin

• Lutein and zeaxanthin are the only carotenoids found in the macula of the retina, where they absorb harmful blue light entering the eye and may play an important role in preventing the development of age-related macular degeneration and cataracts


Lutein and Zeaxanthin

• Act as effective antioxidants because they neutralizes free radicals formed by the action of ultraviolet radiation on the retina to protect the eyes

Marigold Flower Extract (*Tagetes erecta* L.)

- The petals represent a rich source of lutein and zeaxanthin
- Marigolds contain numerous antioxidant carotenoids that give the petals their bright orange and yellow colors

Apple Fruit Extract (*Malus Pumila*)

- Apples have been found to have very strong antioxidant activity
- They are a rich source of phytochemicals
Carotenoid Blend: Alpha-Carotene

- Alpha-carotene is one of the most abundant carotenoids in the diet
- It can be converted in the body to an active form of vitamin A, a nutrient important for vision
- Alpha-carotene has less than half the vitamin A activity of the major vitamin A precursor, beta-carotene

http://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals/flavonoids

Carotenoid Blend: Lycopene

- Lycopene is a naturally occurring compound that contributes to the red color of fruits and vegetables, and is a carotenoid antioxidant
- In the human eye, lycopene is present in the retinal pigment epithelium (RPE)-choroid, ciliary body, and iris
- Beneficial in the prevention and treatment of age-related macular degeneration

Carotenoid Blend: Cryptoxanthin

- A common carotenoid that is found in fruit, such as tangerines, persimmons and oranges
- Cryptoxanthin is a precursor of vitamin A, which is an essential nutrient needed for eyesight, growth, development and immune response

Turmeric Root Extract (*Curcuma longa*)

- Curcumin is also a powerful antioxidant
- Antioxidants scavenge molecules in the body known as free radicals, which damage cell membranes, tamper with DNA, and even cause cell death
- Antioxidants can fight free radicals and may reduce or even help prevent some of the damage they cause
Green Tea Leaf Extract (*Camellia sinensis*)

- Green tea is made from unfermented leaves and contains the highest concentration of powerful antioxidants, called polyphenols.
- The polyphenols in green tea can neutralize free radicals and may reduce or even help prevent some of the damage they cause.

[Link](https://www.umm.edu/health/medical/altmed/herb/green-tea)

Bilberry Fruit Extract (*Vaccinium myrtillus*)

- During World War II, British fighter pilots reported improved nighttime vision after eating bilberry jam.
- Bilberry has been suggested as a treatment for retinopathy (damage to the retina) as they appear to help protect the retina.
- Bilberry has also exhibited protective effects against macular degeneration, glaucoma, and cataracts.

[Link](https://www.umm.edu/health/medical/altmed/herb/bilberry)
N-Acetyl-L-Cysteine

• It functions to protect the structural proteins and enzymes necessary for the maintenance of lens flexibility and clarity
• When taken internally, it replenishes intracellular levels of the natural antioxidant glutathione
• The concentration of glutathione in the lens of the eye is higher than in most other tissues

Taurine

• Taurine is especially vital when it comes to eye health, as adequate levels can help prevent age-related vision loss
• When taurine levels are deficient a variety of vision problems can occur, including diabetic retinopathy
• Evidence is strong that taurine is vital in maintaining optimal retinal function
Quercetin

• Belongs to a group of plant pigments called flavonoids, which give many fruits, flowers, and vegetables their colors
• Flavonoids, such as quercetin, are antioxidants

Grape Seed Extract (*Vitis vinifera*)

• Grapes, or the chemicals within them, have been touted as powerful antioxidants
• A study of healthy volunteers found that taking grape seed extract substantially increased blood levels of antioxidants
Olive Leaf Extract (*Olea europaea*)

- Contains many bioactive compounds that have antioxidant properties and provide health benefits to cell signaling pathways


Sodium Copper Chlorophyllin

- Chlorophyllin is a mixture of water-soluble sodium copper salts derived from chlorophyll
- Chlorophyllin can neutralize oxidants and decrease damage induced by chemical carcinogens and radiation

Most Common Eye Diseases

• Between 2010 and 2050, the estimated number of people affected by most common eye diseases will double

https://nei.nih.gov/eyedata

The Amsler Grid for Macular Degeneration

Grid seen by someone with normal vision
AREDS-Based Supplement

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A (beta-carotene)</td>
<td>360mcg</td>
</tr>
<tr>
<td>Vitamin C (ascorbic acid)</td>
<td>440mg</td>
</tr>
<tr>
<td>Zinc (gluconate)</td>
<td>15mg</td>
</tr>
<tr>
<td>Selenium (amino acid chelate)</td>
<td>40mcg</td>
</tr>
<tr>
<td>Copper (gluconate)</td>
<td>1.7mg</td>
</tr>
<tr>
<td>Lutein (marigold flower extract)</td>
<td>18mg†</td>
</tr>
<tr>
<td>Zeaxanthin</td>
<td>3.6mg†</td>
</tr>
<tr>
<td>Proprietary Blend</td>
<td>234mg†</td>
</tr>
</tbody>
</table>

- Apple Fruit Extract (Malus pumila), Carotenoid Blend (Alpha-Carotene, Lycopene, Cryptoxanthin), Turmeric Root Extract (Curcuma longa), Green Tea Leaf Extract (Camellia sinensis), Bilberry Fruit Extract, (Vaccinium myrtillus), N-Acetyl-L-Cysteine, Taurine, Quercetin, Grape Seed Extract (Vitis vinifera), Olive Leaf Extract (Olea europaea), Sodium Copper Chlorophyllin

References

- The University of Maryland Medical Center website: [https://www.umm.edu/health/medical/altmed/](https://www.umm.edu/health/medical/altmed/)
- Sunrise Children’s Hospital website: [https://sunrisechildrenshospital.com/hl/?/21807/NAC](https://sunrisechildrenshospital.com/hl/?/21807/NAC)