Nutrition and the Eye

Are vitamins and other nutritional supplements important for eye health and vision? Let’s separate conjecture from science. First, there’s AREDS and **macula degeneration diseases.** AREDS (The Age Related Eye Disease Study, published by the National Institutes of Health) is actually now two very large, carefully designed and peer reviewed studies that determined that a specific combination of vitamins and associated nutrients can in many cases reduce the risk of vision loss from macula disease. In a substantial number of cases this nutrient mix slowed down or even stopped the progress of the disease and recommending this treatment to at-risk patients is now the standard of care. There are a number of known and suspected causes of macula disease, including genetic predisposition and systemic diseases. Clearly, nutrition plays an important role, too. The AREDS recipe is included here, below.

The need for vitamin A in the human vision system was identified almost 100 years ago. The biochemistry was clearly identified over fifty years ago, making vitamin A the first vitamin carefully examined; hence the reason why it is called A.

Remember the centuries old story about carrots and eyesight? Carrots contain carotene, which just so happens to be part of a chemical reaction in the retina that converts light energy into an electrical signal. People with vitamin A deficiency experience night blindness, or more commonly, poor adaptation to vision in low light situations. As the depletion of beta carotene increases, the quality of vision decreases. Some people with night vision disorders also experience glare and haze under normal light levels because brightness information is not correctly processed as visual data.

Vitamin A starts out as beta-carotene, one of the family of plant chemicals known as carotenoids, which also includes lutein, zeaxanthin and others. When we consume vegetables containing beta carotene (dark green leafy types: spinach, kale, broccoli, cauliflower, cabbage, mustard and collard greens, as well as yellow-orange vegetables like carrots, cantaloupe, pumpkin, yellow squash, etc.), our bodies convert it to the various other forms of vitamin A called retinols. Some are used for skin and ligament repair, others for transporting enzymes and proteins, and some of it is used in the bio-electrical process of vision. Beta-carotene is also one of the anti-oxidants which acts as a free-radical scavenger, helping to eliminate damaged cells within our bodies. There is evidence that this type of reaction is important in fighting certain cancers and regulating the aging process.

Lutein and it’s cousin, zeaxanthin have recently been added to the list of key eye function nutrients. There’s a lot of those chemicals in the macula lutea. It’s even in the name! The AREDS II study and some others looked at these two yellow carotenoid compounds and it appear they might be crucial to maintaining the health of the retina and are now included in the macula degeneration nutrient mix.

**Dry eye syndrome** (DES) is a condition in which inadequate tear production, either the water fraction or the oil or mucous part of the tear film causes tissue damage to the cornea (clear window over the colored iris inside the eye) or conjunctiva (the thin transparent membrane that lines the eyeball and the inside of the lids.) There are a number of causes of DES, including hormone changes in some women, eye lid meibomian (oil) gland dysfunction, inflammation,
allergies, diabetes, rheumatoid arthritis, certain autoimmune disorders and more. We can try to identify the cause and treat that part of the cycle. There’s also good scientific evidence that when inflammation and meibomian gland dysfunction are a cause, omega 3 & 6 fats from flaxseed and fish oil can help. These fat compounds help to reduce inflammation and tend to cause meibomian oils to become thinner and less viscous.

**Cataracts:** Lastly, although there is currently no clear scientific evidence for this one, researchers are looking into n-acetyl cysteine/carnosine (NAC) and ascorbic acid (vitamin C) used as an eye drop and taken orally as preventative for oxidative aging changes in the crystalline lens inside the eye. That’s the part that as it ages causes a gradual loss of near focusing ability (presbyopia) and later, the clouding of the lens, what we call **cataracts.** Cataract surgery to remove the old, hard and cloudy lens and replacing it with a nice new plastic model is almost a routine, accepted part of being in your late 60s or 70s. There appears to be a connection with advancing lens changes and faulty sugar metabolism as in diabetes and exposure to UV light tends to help age the lens. We’ll have to wait for the scientific testing to prove the NAC and vitamin C connection, but for now, sunglasses are a must-have protection plan. And don’t forget to eat your carrots and spinach with dinner and have a nice piece of cantaloupe for dessert!

**Dietary concerns: How much is enough?**

One issue that is not clearly understood is the relationship between consumption of these nutrients and the resulting bio-availability to the eye tissues. For some people, taking large quantities of these nutrients does not increase its presence in the eye. For others, just eating vegetables does the trick. Some researchers feel that when the key to making these important micronutrients easily available to the eye is found, the aging process within the eye may be halted. This may eliminate presbyopia (near vision focusing problems in people over 40), cataracts (the clouding of the crystalline lens) and macula degeneration (loss of active photoreceptors in the retina).

People with age-related macular degeneration or risk are encouraged to take supplements consisting of:

- 5-15mg beta-carotene,
- 100-400 IU tocopherol vitamin E,
- 500-1000 mg vitamin C, 50% as calcium ascorbate,
- 15-45 mg zinc,
- 25-40mcg selenium
- 5-50mg l-glutathione
- 6-15 mg lutein

A number of products are available with these micronutrients. They are marketed under the brand names: OcuVites, EyeVites, OcuCaps, I Caps Plus and others. If you consider purchasing them, first check your regular multi-vitamin/mineral supplement and your anti-oxidant supplement. You may already be getting appropriate levels of these important nutrients.
Remember that the carotenoids and most minerals are readily available in vegetables! There is increasing scientific evidence that obtaining these from natural dietary sources may provide better tissue absorption as you are getting other related compounds as well. That is how the effects of lutein were discovered! Also, eating whole foods is good for you. They provide a source of fiber and protein---the way nature intended for you to get your nourishment. Supplements are, however, appropriate for certain people who would not ordinarily be able to get adequate amounts of these important nutrients or who have metabolic deficiencies which prevent their absorption.

Certain medications may interact with micro-nutrients. It is a good idea to consult with a physician or dietitian before beginning special nutritional therapies.