Diet and Vision Study Participant Newsletter

Winter 2018

Happy New Year from the Diet and Vision Research Team!

2018 marks the 16th year since you first participated in the Diet and Vision Study, an ancillary study to the Women's Health Initiative. We are grateful for the time you gave this study! Between 2001-2004, your participation, along with 2,000 other women from Oregon, Iowa, and Wisconsin has provided invaluable data to our research studies of diet and eye health, shared with scientists and eye doctors around the world.

Thanks also to the hundreds of you who have been willing and able to participate in the **Second** Diet and Vision Study, funded by the National Eye Institute, in progress since 2016. It is **the very first large, world-wide study assessing the stability of plant pigments in our eyes** taking place over a decade. It evaluates the long-term benefits of plant pigments in our eyes for improving vision and lowering risk of common age-related eye diseases. (This part of the Diet and Vision Study is called the "Carotenoids in Age-Related Eye Disease Study".) This study informs us about how a simple, non-invasive measure of plant pigments (like lutein) in the back of our eyes might predict eye health (and more) over a decade later! For those of you who have not yet had an opportunity to participate in this second study, **stay tuned for additional options for participation in 2018!**

In this newsletter, we describe new ways to learn about the many insights this study has contributed about diets, lifestyles and genetics which promote good vision.

Why do plant pigments matter? How do I increase lutein in my eyes?

When we eat foods containing the carotenoid plant pigments lutein and zeaxanthin, they accumulate in our eyes. Sources in the diet include many vegetables (especially dark leafy greens), fruits, and egg yolks. The most concentrated accumulation of these yellow pigments are in the center (macula) of the back of the eye (retina) and comprise "macular pigment." Macular pigment absorbs excessive light (in the blue range of the visible light spectrum) like sunglasses, protecting the retina and helping us see better. These pigments are also antioxidants and fight inflammation.

Macular pigment density has, on average, ***increased*** over time in women who have participated in our study so far. This suggests that these protective pigments do not

necessarily decline with age, as some previous studies suggested. These findings suggest that we can increase these pigments in our eye at any age, if we incorporate them into our diet. We will soon learn the final results from the Second Diet and Vision Study, suggesting ways we can enhance their accumulation. (Some of us accumulate them more easily than others.) Study visits are expected to conclude in June 2018. We are studying whether other aspects of diet, supplements, health, and genes are related to maintaining or increasing these eye pigments over the past fifteen years.

Many studies suggest that men and women who have **diets** rich in lutein develop fewer age-related eye disease such as central cataract, macular degeneration and glaucoma. What's more, balanced, lutein-rich diets containing a lot of fruits and vegetables (such as Mediterranean Diets) have been demonstrated to lower blood pressure and the risk of developing many chronic diseases.

Do lutein supplements help people see better?

So far, 17% of women in this study are taking vitamin supplements that contain lutein (or zeaxanthin or mesozeaxanthin) in levels ranging from 2 milligrams to 45 milligrams. Two milligrams is about the level in the average American's diet.

Will they help me see better? It is **too early** to know whether these supplements can reliably improve vision. It is also too early to know how much lutein intake is safe and which formulations are best. Many small studies in which participants take supplements of lutein and/or related compounds for 6 months to 2 years suggest that vision improves in a variety of ways, both in people with and without age-related eye diseases such as age-related macular degeneration. However, the results are not consistent from study to study, nor do we know the impact over longer periods of time. Testing has not been done on the safety of taking high doses of supplements (more than 20 mg) over many years. Longer and larger studies are needed. You should always discuss with your eye care provider supplements that are best for you.

In 2018, we plan to present early Diet and Vision Study findings at international meetings, suggesting that women with higher levels of macular pigments see better. Our study results indicate that women with higher levels of these pigments in their eyes have better ability to see contrasts, which is important in seeing edges, such as stair steps. Our early findings also suggest that vision is improved in women both with and without age-related eye diseases (such as macular degeneration or glaucoma).

A large clinical trial conducted by the National Eye Institute (the Second Age-Related Eye Disease Study [AREDS2]) indicated that adding lutein and zeaxanthin to high dose antioxidant supplements slowed progression of age-related macular degeneration in certain individuals. The protective effect was seen when lutein and zeaxanthin replaced beta-carotene in the supplement formula, and in people with

low levels of lutein and zeaxanthin in their diets.

Lutein levels in our eyes reflect levels in our brains. New studies suggest that higher lutein and zeaxanthin intake can provide improvements in thinking and memory for both young and old individuals. However, other studies suggest no such improvements with lutein supplements.

The degree of benefit to vision function is unclear at this time. We hope that the several vision tests performed in the Diet and Vision Study (and other studies of younger people) will provide more answers.

Could plant pigments in our eyes tell us something about our overall health?

The 20% of women with the highest levels of macular pigment in 2001-2004 were 40% more likely to survive through 2016. Why? We know from the first Diet and Vision Study that women with higher macular pigment levels were generally healthier (for example, less likely to have chronic diseases), and had healthier lifestyles (for example, consumed more fiber). These characteristics reflect body processes that enhance the body's ability to absorb lutein and zeaxanthin from the diet into the body, transport them in the blood and take them up into the retina. Someday we may want to measure macular pigment routinely when attending eye appointments and those of us with low macular pigment might be advised to adopt healthy lifestyles not just to increase pigment levels in our eyes, but also to lower risk for many chronic diseases and improve vision.

Too soon to tell…

It is still too early to know whether the early results can be repeated in larger and longer-term studies. Results from the Second Diet and Vision Study will contribute to the scientific evidence needed to support such studies.

For a full review of the current scientific literature about lutein and zeaxanthin and eye health, see Dr. Mares' recent article "Lutein and Zeaxanthin Isomers in Eye Health and Disease" at: http://pubmed.gov/27431371.

Learn Along with Us

New this year is a link for Diet and Vision Study participants on the research team website of Principal Investigator, Julie Mares. This link gives you a fast and easy way to learn what your participation in the first Diet and Vision Study made possible, and to share this information with your friends and family. To access it go to this site:

nutritionforeyes.ophth.wisc.edu

And click on the link: *"For Diet and Vision Study Participants"*

This link explains our unique studies of lutein plant pigments and eye health that the Diet and Vision Study has contributed, and will continue to contribute, along with practical hints about healthy diets and lifestyles that may improve vision. Also on this website are results of studies on vitamin D and healthy diet patterns that your participation made possible.
Stay tuned!

The value of your participation in the Diet and Vision Study and Women's Health Initiative over the years continues to grow. This includes studies which do not require you to attend new study visits! We will continue to post new findings as they become available. For example, collaborators are using previously collected information and blood samples you provided (if you consented to this) to plan studies that help us understand the role of vitamin D and B vitamins on eye health.

Pilot studies of our gut microbes, B vitamins and eye have been conducted. Findings are being used to develop larger studies with collaborators. Also, pilot studies on the benefits of breast feeding on lifelong eye health have been conducted. This was done because early findings suggested that women who were breastfed as infants had more plant pigments in their eyes in adulthood (breast milk provides lutein that is readily absorbed by the retina in infancy, when critical development of the eye occurs). We have conducted more pilot studies in middle-age men and women that are consistent with these findings, and we are planning more studies on how this might influence vision, and possibly even brain health, over a lifetime.

Would you prefer paper copies of what we are learning? Please feel free to call our study coordinator at our toll-free number 1-844-218-5656 or complete the enclosed postcard, and we would be happy to send this information to you.

Recent or Upcoming Presentations

On April 5, 2018, Principal Investigator Dr. Barbara Blodi of the University of Wisconsin-Madison will be presenting a talk "The ABCs of AMD". To register to attend or view this event, you may go here:

https://www.ophth.wisc.edu/event/saving-sight-session/

At an October 2017 Saving Sight Session at the University of Wisconsin-Madison, Dr. Mares presented a talk, *"What Are Plant Pigments Doing In Our Eyes? What Can They Tell Us?" Watch the website for a link to the video recording, coming soon!*