Retina Care "Plus"

How Primary Eye Care Can Elevate Patients' Retinal Health

Kerry Gelb, OD
is a practicing optometrist at
Contact Lens & Vision, Woodbridge, NJ.

Retinal health and function has always been an essential part of primary eye care. Optometrists examine the entire eye from the front to the back, and this, of course, includes the retina, its structure, and its function. Retinal examination is a fundamental part of the optometric evaluation.

Thanks to improvements in retinal technology, eye care professionals are now able to move beyond routine assessments of the retina and advance to what I call a 'retina care plus' model; that is, retina care *plus prevention*, in order to broaden the scope of their optometric care. This novel approach enables eye care professionals to address their patients' retinal health and function, with the aim of catching any potential damage early and preventing progression to disease.

Optometrists, because of the amazing technology available to them, can detect potential disease long before the primary care physician, and recommend strategies to reduce mortality and morbidity, and lower healthcare costs. This capability has become even more profound with our aging population.

Contemporary imaging modalities enable clinicians to, for example, more easily observe subtle macular pigment changes, early drusen, microaneurysms in the retinal capillaries, and tiny retinal hemorrhages. Such findings offer optometrists a more complete picture of the eye's health and the opportunity to manage patients more impactfully through functional, preventive medicine approaches that address root causes.

Proactive and preventive care is not a new concept for optometrists in other areas of practice. Adapting this approach in the retinal realm can steer patients toward better retinal and overall health, and strengthen the doctor-patient relationship. Eye care professionals who go beyond their usual responsibilities to provide guidance on improving overall nutrition and exercise habits, reducing stress levels, smoking cessation, and proper macular supplementation can lead to life-changing improvements for patients, reinforcing their loyalty to the practice.

The Right Technology to Intervene

To move to the next level in retina care, it's key that optometrists have the right imaging technology in their practices. State-of-the-art retinal cameras and optical coherence tomography technology (OCT) systems are essential tools to assess retinal structures, and help monitor disease progression and therapeutic responses.

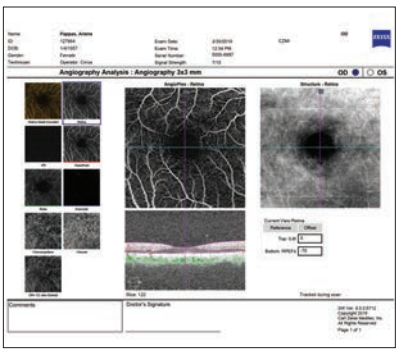
Retinal cameras offer the clinician a better view of blood vessel changes that might indicate diabetes or macular degeneration, while OCT provides structural details of the retina, resulting in quantitative and qualitative information that is useful in tracking diabetic macular eye disease. The OCT is sensitive down to approximately 8

Link Between Retinal Microaneurysms & Diabetes

The association between findings of retinal microaneurysms and future diabetes is strongly correlated. One study I co-authored and published in *Diabesity* looked at how insulin resistance negatively affected the retinal vessel health of individuals at risk of diabetes.[1]

Using highly sensitive 580nm multispectral retinal imaging, our group found that subclinical retinal microaneurysms correlated with insulin and pancreatic function, and IR measures more closely than fasting glucose tests. We concluded that diabetes research should focus on retinal microaneurysms and IR as actionable pre-diabetes and pre-retinopathy risk factors. *—Dr. Gelb*

1. Gelb K, Richer S, Zimmer C, et al. Retinal multispectral imaging of 'sub-clinical' capillary micro-aneurysms in non-diabetics correlates with insulin resistance. Diabesity. 2016;2(3):19-25.



OCTA Images. Microaneurysms in a diabetic patient. Images: Kerry Gelb, OD

microns, allowing the optometric physician to zero in on the smallest retinal blood vessels, providing excellent ability for very early detection of hidden problems.

More recently, advanced OCT angiography (OCTA) has become available to produce depth-resolved images of abnormal new blood vessels at the macula without the need for contrast agents, while ultra-widefield imaging is able to capture up to 200 degrees of retinal view in a single shot.

Catching Disease Early

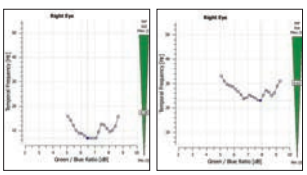
New technology can illuminate subtle harbingers of disease sooner than direct ophthalmoscopy. For example, it can help optometrists detect early drusen (signs of age-related macular degeneration) or retinal pigment epithelium stacking (signs of geographic atrophy) that are not appreciable by more traditional means. In addition, OCTA and advanced retinal cameras can reveal microaneurysms and intraretinal hemorrhages that aid clinicians in identifying individuals at risk for diabetic retinopathy or diabetes. This capability is paramount, as research has borne out a strong connection between the presence of microaneurysms and future diabetic disease.[1]

In my own clinical experience, I have had a number of patients present with hemorrhages imperceptible on direct ophthalmoscopy that led to eventual diagnoses of diabetes. So having access to advanced imaging technology that can pinpoint early signs is invaluable for me as a doctor and for my patients.

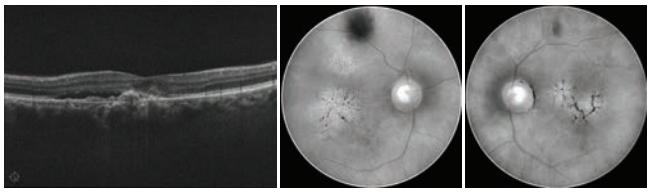
Using Nutraceuticals to Improve Retinal Health & Vision

In addition to leveraging advanced imaging, I also test patients' macular pigment density to evaluate retinal health. If I see evidence of abnormal macular pigment loss, I recommend macular supplementation—specifically MacuHealth with LMZ (which I also use daily).

The macula relies on three diet-derived pigments—lutein, zeaxanthin, and meso-zeaxanthin (MZ)—to function optimally. Numerous studies have shown that people with low macular pigment are at greater risk for macular degeneration, and that boosting pigment levels can slow damage from natural aging and oxidative stress that frequently leads to disease.[2-6] Another reason why macular supplements are so important is that most of us are not getting adequate nutrients from our diets, partially because the nutrient content of fruits and vegetables has declined over time.[7,8]



Macular Pigment Improvement. Macular pigment optical density improvement seen after supplementing with MacuHealth with LMZ, using the QuantifEye MPOD Measurement Instrument.



OCT and Fundus Imaging. Macular degeneration is evident.

Since I've been recommending macular supplements over the last 15 years, I have observed transformative improvements in my patients' retinal health and functional status. I only recall one patient progressing to wet macular degeneration among the hundreds who have supplemented and made positive dietary changes.

Macular supplementation is also exceptionally beneficial for healthy patients. Since the macula makes up the central 4% of the retina, and mediates central and color vision, optometrists can actually enhance visual function in healthy patients through proper nutritional supplementation.[2] Studies show that increasing the density of the macular pigment layer can improve contrast sensitivity, decrease glare, and aid in photostress recovery.[9,10]

Rationale for Adding the Next Level of Retina Care

The reason I added preventive retinal care to my practice is because I wanted to help my patients *before* they were diagnosed with disease. Since I have a way to support patients' eye health and vision for a lifetime—through proper macular supplementation—I want to start taking action immediately. The decision to expand into preventive retina has paid off exponentially for my patients' eye and vision health, as well as for my practice in the form of ongoing referrals from extremely happy patients. In fact, my happiest, most enthusiastic patients are the one I speak to about lifestyle medicine.

It's true that optometrists are busy seeing patients and running practices on a day-to-day basis, and the idea of adding another clinical responsibility might not be top of mind. Also, some optometrists could be uncomfortable about the idea of selling or promoting nutritional supplements. However, if eye care providers take the time to educate themselves on the enormous benefits of macular nutrition to patients, the decision to recommend supplementation is an easy one.

The best part about expanding retina in the eye care practice is that it's a win-win—for patients' health and the practice's growth. Many ocular and systemic diseases that manifest in the body show early signs in the retina, so the opportunity for optometrists to extend care beyond their existing scopes of practice is considerable. But even more importantly, I firmly believe that to be a great, comprehensive optometrist, you have to be great at retina.

Clinical Strategies to Address the Whole Patient

Along with recommending macular supplementation to patients who exhibit low macular pigment levels or early signs of AMD, I prescribe omega-3 supplementation and refer for vitamin D blood tests. If vitamin D levels are low, I encourage patients to get out in the sun more often or take a vitamin D3 and K2 supplement to improve cardiometabolic function and overall health.

Often, I will assess DNA methylation, a process that can modify gene function, and test for MTHFR gene mutations—which can affect the body's ability to use folic acid or folate, and increase disease risk. If patients test positive for mutations, I'll prescribe a B-complex supplement.

I also spend time discussing lifestyle improvements such as diet and exercise strategies with patients. *—Dr. Gelb*

1. Gelb K, Richer S, Zimmer C, et al. Retinal multispectral imaging of 'sub-clinical' capillary micro-aneurysms in non-diabetics correlates with insulin resistance. Diabesity. 2016;2(3):19-25.
2. Nolan JM, Power R, Stringham J, et al. Enrichment of Macular Pigment Enhances Contrast Sensitivity in Subjects Free of Retinal Disease: Central Retinal Enrichment Supplementation Trials - Report 1. Invest Ophthalmol Vis Sci. 2016;57(7):3429-39.
3. Akuffo KO, Beatty S, Peto T, et al. The Impact of Supplemental Antioxidants on Visual Function in Nonadvanced Age-Related Macular Degeneration: A Head-to-Head Randomized Clinical Trial. Invest Ophthalmol Vis Sci. 2017 Oct 1;58(12):5347-60.
4. Nolan JM, Akkali MC, Loughman J, et al., Macular carotenoid supplementation in subjects with atypical spatial profiles of macular pigment. Exp Eye Res. 2012 Aug;101:9-15.
5. Thurnham DI, Nolan JM, Howard AN, et al. Macular response to supplementation with differing xanthophyll formulations in subjects with and without age-related macular degeneration. Graefes Arch Clin Exp Ophthalmol. 2015 Aug;253(8):1231-43.
6. Ma L, Liu R, Du JH, et al. Lutein, Zeaxanthin and Meso-zeaxanthin Supplementation Associated with Macular Pigment Optical Density. Nutrients. 2016 Jul 12;8(7). pii: E426.
7. Davis DR, Epp MD, Riordan HD. Changes in USDA food composition data for 43 garden crops, 1950 to 1999. J Am Coll Nutr. 2004 Dec;23(6):669-82.
8.Scheer R, Moss D. Earth Talk. Dirt Poor: Have Fruits and Vegetables Become Less Nutritious? Available at: https://www.scientificamerican.com/article/soil-depletion-and-nutrition-loss/ (last accessed July 2, 2019).
9. Nolan JM, Power R, Stringham J, et al. Enrichment of Macular Pigment Enhances Contrast Sensitivity in Subjects Free of Retinal Disease: Central Retinal Enrichment Supplementation Trials - Report 1. Invest Ophthalmol Vis Sci. 2016;57(7):3429-39.
10. Stringham JM, Garcia PV, Smith PA, et al. Macular pigment and visual performance in glare: benefits for photostress recovery, disability glare, and visual discomfort. Invest Ophthalmol Vis Sci. 2011; 52:7406-15.