Establishing a Center for Macular Health in Your Practice

Help Patients See Better and Manage Risk Factors through Healthy Macular Pigment
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Introduction

Macular health has been a hot topic the last few years, with many new technologies and scientific studies focused on the role of nutrition and macular health. Until recently, most nutrition studies related to macular health have been associated with Age-Related Macular Degeneration (AMD). Recent scientific studies support the assertion that healthy and dense macular pigment also improves visual function. This whitepaper was written to provide clarity and a supportive rationale regarding the creation of a “center for macular health” in your practice. Most practitioners have and utilize imaging technologies and other tools to diagnose macular pathology. Others are looking for tools and options to preserve their patient’s macular health and minimize the risk of disease. Toward that end, many doctors have begun offering Macular Pigment Optical Density measurement (MPOD), nutritional counseling, and nutritional supplements to provide the most comprehensive macular care for their patients. This paper addresses the nutrition related aspects of creating a center for macular health in your practice.

Patient Types

While macular health is applicable and important to all, this paper will focus primarily on Baby Boomers – those born between 1946 – 1964 (currently between the ages of 48 and 66). According to the US Census Bureau, there were approximately 35 million Americans age 65 and older in 2000. By 2030, our aging population over age 65 is forecasted to double to an estimated 78 million people, or 26% of the population.

As an OD, you probably see these patients every day. As we age, our vision deteriorates and the risk of Age-Related Macular Degeneration and visual performance deficits increase. Therefore, the goal of establishing a center for macula health is to help patients preserve and enhance their vision.
A growing number of Baby Boomers understand the potential effects of aging on their eyesight and are therefore motivated to take action to maintain their independence. Studies show that today’s “older” Americans are far more active for much longer than previous generations; they stay in the workforce longer; have more hobbies and interests; and some studies among this group report that loss of independence is actually feared more than death. So, when older patients are able to drive safer and more confidently; handle bright light easier; read without strain; and manage risk factors for AMD, the case for a center for macular health becomes much clearer.

**Nutrition and Supplementation**

Considering that the #1 vegetable in the US is the french fry, it is unlikely that most patients are going to turn over a new leaf, and become prolific vegetable eaters. What’s more, the stats tell the hard truth: as a society, our diets and health status are becoming less healthy every day. Obesity and diabetes are rampant, and the Centers for Disease Control and Prevention (CDC) indicate that nearly 33% of US adults are obese, 25 million have diabetes, and another 86 million have undiagnosed prediabetes.

**What Your Eyes Need Most**

There is a deep and ever growing body of scientific evidence supporting the relationship between proper nutrition and macular health (more than 300 published clinical studies/papers). Later in this document we provide highlights of several studies that demonstrate the very important role nutrition (including supplementation) plays in supporting the macula and helping patients see better and manage their AMD risk. Unfortunately, most don’t consume enough of the right nutrients in their diet to build and maintain a healthy, dense macular pigment comprised of Zeaxanthin (zee-uh-zan-thin) and Lutein.
Macular Pigment and Macular Health

Macular pigment is made up of two carotenoids: Zeaxanthin and Lutein, which are photo-protectants and antioxidants. An apple provides a great example of how antioxidants provide protection. The skin of the apple protects the inside until it is sliced open and exposed to oxygen. When this occurs, the inside turns brown via a process known as oxidation. A similar process occurs in our eyes over time as we age.

Macular pigments and the protection they provide in the eye have often been compared to “internal sunglasses.” The macular pigments play an important role in protecting the rods and cones from damaging light and they are also essential to healthy vision. Thick, dense internal sunglasses block the harmful blue light part of the light spectrum that damages one’s eyes across their lifetime.

Healthy Fovea and Biological Positioning

The cone-rich fovea resides in the center of the macula and a healthy fovea contains a natural 2:1 ratio of Zeaxanthin to Lutein. Zeaxanthin is biologically positioned in the center of the macula to protect the cones, while Lutein is positioned more in the para-foveal region to protect the rods. Zeaxanthin and Lutein are found at a 1:1 ratio in the macula as a whole and their unique biological positioning signals the importance of both macular pigments in properly protecting one’s eyes.
Macular Pigment: The Eyes’ Internal Sunglasses

While Zeaxanthin and Lutein are the two dietary carotenoids in the macula, a third non-dietary carotenoid, meso-zeaxanthin, is sometimes present (through conversion of Lutein) when one does not consume adequate quantities of fruits and vegetables or supplements that contain dietary Zeaxanthin. The body cannot synthesize or create dietary Zeaxanthin or Lutein, so they must be obtained through the diet.

Lutein is found in many dark green leafy vegetables like spinach, collards, or kale and is relatively easy to obtain through the diet. Zeaxanthin is far more scarce in the average daily diet, requiring one to consume an extraordinary amount of corn, red/orange peppers, goji berries, or other brightly colored fruits and vegetables to obtain the amount necessary to establish or maintain healthy macular pigment density. Based upon the difficulty to consume an adequate quantity of dietary Zeaxanthin via food sources, it is understandable and logical that many prefer to take supplements with a higher quantity of dietary Zeaxanthin vs. Lutein.

**Internal Sunglasses**

Healthy macular pigment can act like “internal sunglasses” to protect the cones in the macula in the back of the eye that are responsible for central vision.

**Weak Internal Sunglasses:**
- Low levels of Zeaxanthin
- Blue light passes through
- Damages cones responsible for central vision
- Increases risk for AMD
- Decreases visual performance

**Strong Internal Sunglasses:**
- Healthy levels of Zeaxanthin
- Absorbs harmful blue light
- Protects cones and photoreceptors
- Reduces key AMD risk factor
- Enhances visual performance
Macular Pigment Protects and Enhances Central Vision

Below are some of the benefits associated with healthy macular pigment:

**AMD** – low macular pigment is a key risk factor for Age-Related Macular Degeneration (AMD).

**Photophobia** – low macular pigment can contribute to increased light sensitivity.

**Contrast Sensitivity** – the ability to distinguish an object from other objects or background.

**Distance Viewing and Haze** – vision improvement in an open area, the effect of haze on how far one can see.

**Glare Disability and Veiling** – Reduction in vision due to direct bright light or bright light at an angle.

**Color Saturation** – blue light spectrum tends to scatter in the eye causing a reduction of saturation of colors.

**Chromatic Aberration** – different wave lengths of light focus at different point in the eye causing a bluish purple outline to some objects.

**Acuity** - ability to see clearly is affected by contrast sensitivity, glare, light scatter, and other factors.
Quality Nutraceuticals

For many, the terms “vitamin” or “supplement” conjure up images of advertisements that promise unrealistic and unbelievable benefits. Unfortunately, there are less than truthful companies in the supplement industry that cut corners and take advantage of the unsuspecting and it can be daunting to find a trusted company with high quality products. Companies like ZeaVision have been serving doctors and patients for more than a decade and have earned customer trust with products like the EyePromise brand of nutraceuticals that are scientifically proven to increase Macular Pigment Optical Density (MPOD), and feature an unconditional, 60-day money-back guarantee.

Quality manufacturing is essential to producing a high quality nutraceutical product. Companies that strictly adhere to the FDA’s current Good Manufacturing Practices (cGMP), conduct internal as well as external third-party testing of ingredient composition, strength, purity, label compliance, and quality are rare. Quality is indeed a very important consideration in selecting a nutraceutical supplier.

Key considerations when choosing a nutraceutical for your patients and practice:

- Where are the ingredients made/sourced?
- Are the ingredients natural or synthetic?
- Where is the finished product manufactured?
- What is the track record of the manufacturer and product(s)?
- Are the products safe?
- Is there science to validate the products?
- What quality guidelines does the manufacturer follow (cGMP FDA, GOED, NSF, CRN, others)?
- What happens if a patient cannot tolerate the product?
- What training is provided to help implement in your practice?

Whether you currently offer nutraceuticals or have been thinking about it, there are many things to consider and doing a bit of homework will elucidate the many patient and practice benefits while helping you choose a manufacturer and brand that truly enhances the patient care you are providing.
Macular Pigment Measurement

MPOD or Macular Pigment Optical Density measurement is non-invasive, fast, and easy. Currently, the only commercially available technology to conduct macular pigment measurement is Heterochromatic Flicker Photometry (HFP). HFP is a subjective exam, and is accomplished when two lights of different color are alternated at various wavelengths, and their relative intensities are observed by the patient until the flicker sensation is minimized or increased, depending upon the instrument. MPOD measurement is similar to a visual field test.

What are the benefits of measuring a patient’s macular pigment?

1. Low MPOD is a key risk factor for AMD
2. Higher MPOD is associated with increased visual performance
3. MPOD measurement demonstrates if supplementation is effective
4. MPOD measurement encourages nutraceutical compliance

While there are a couple of MPOD instruments commercially available, you may want to ask:

- Is the technology and instrument proven, reliable, repeatable?
- How will it affect lane time and office flow?
- Will my staff and patients be able to use it easily?
- How does it fit with other technology and areas of focus?
- Will the company provide initial and ongoing training support?
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Though all MPOD devices employ HFP, instruments vary widely in terms of software, user interface, reliability, and repeatability. A few things to consider are:

- Does the MPOD instrument store patient data and results for later viewing?
- Does the MPOD instrument allow electronic transfer of patient results into EMR?
- Does the MPOD instrument provide a graph or validation of responses to assess accuracy?
- Does the MPOD instrument require operator/patient communication during exam?
- Does the MPOD instrument have to be manually calibrated for flicker sensitivity?
- Does the MPOD instrument have the ability to measure central and peripheral MPOD?
- Does the MPOD instrument offer the ability to do central testing with peripheral estimate?
- Does the MPOD instrument result in an exam that takes more than 3 minutes?

There is a lot to consider when evaluating an MPOD device, but it is a particularly opportune time given the growing awareness around AMD and macular pigment health among Baby Boomer patients. MPOD instruments like the QuantifEye® instrument are utilized by hundreds of EyeCare Professionals every day, and validated by scientific research.

Science to Support – Nutrition and Macular Health

To date, there are more than 300 published studies/papers regarding nutrition and eye health; macular pigment measurement; and the effects of nutritional supplementation. Below is a summary of some of the most relevant research providing scientific evidence that nutrition, supplementation, and healthy macular pigment can allow patients to see better and manage AMD risk factors.
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AMD & Macular Pigments: (Zeaxanthin and Lutein)

**POLA Study:** (Delcourt et. al. - Investigative Ophthalmology and Visual Science: 2006)
- 899 subjects
- Patients with high plasma levels of Zeaxanthin had a 93% reduction in AMD
- Patients with high plasma levels of Lutein had a 79% reduction in AMD

**Rotterdam Study:** (Lintje Ho, MD et. al - Archives of Ophthalmology 2011)
- 2,167 subjects
- Participants with genetic AMD risk factors in the highest tertile of dietary zinc, B-carotene, Lutein/Zeaxanthin, and EPA/DHA intake had a significant hazard ratio reduction for AMD of approximately 40%.

**Serum Carotenoids and Risk of AMD:**
(Zhou et. al. - Investigative Ophthalmology and Visual Science 2011)
- 263 Chinese subjects
- Serum levels of carotenoids and retinol were significantly lower in cases with exudative AMD than in controls.
  - Zeaxanthin (96% Relative Risk Reduction) Lycopene (78% Relative Risk Reduction)
- No significant associations between serum Lutein and cases with early or exudative AMD were observed.

**Blue Mountains Eye Study:**
- 2,454 subjects
- Higher dietary intake of Zeaxanthin and Lutein reduced risk of AMD (in 3654 patients) by 65%.
- Confirmed protective influence of zinc.
- Higher beta-carotene associated with increased risk of AMD.

**AREDS Report 22:** (Emily Chew, MD, et. al. - Archives of Ophthalmology: 2007)
- 4,757 subjects
- Participants reporting highest intake of Zeaxanthin & Lutein less likely to have advanced AMD (NV & GA) or intermediate drusen.

**Zeaxanthin & Visual Performance benefits:**

**Richer, Stuart, et. al.**
(Zeaxanthin and Visual Function Trial - Journal of Optometry, November 2011)
- 60 elderly subjects with early to moderate AMD
- Consumed 8mgs of dietary Zeaxanthin per day for 12 months
- Improved high contrast near visual acuity by 8.5 letters or 1.5 lines
- Achieved clearing of central scotomas
- Improved foveal shape discrimination
- Improved night driving skills

**Stringham, Hammond, et. al.** (Optometry and Visual Science: 2008)
- Retinal increase of Zeaxanthin and Lutein reduced glare disability through improved photostress recovery times. Contrast sensitivity also improved.
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**Kvansakul, et. al.** (Applied Vision Research Centre, City University, London: 2006)
- Zeaxanthin and Lutein improve contrast acuity in the mesopic range and may benefit night driving.

**Stringham, Hammond, et. al.** (Journal of Food Science: 2009)
- Glare induced photostress recovery times can be reduced by 5 seconds by increasing macular pigment via supplementation. This equates to 440 ft. improved reaction time at 60 MPH while driving at night.

**Macular Pigment Optical Density Measurement: (MPOD)**

**Van Der Veen, et al.** (Ophthalmology and Physiological Optics 2009)
- MPOD was measured with the QuantifEye device and the method demonstrated good repeatability with ($r = .97$) and the data are comparable with retinal reflectometry ($r = .78$).

**MPOD Measurement** (Berendschot, et. al. – Eye 2011)
- We found low agreement between test and retest measurements with Macuscope.
- We found high agreement between test and retest measurements of QuantifEye ($0.02 \pm 0.18$) and the fundus reflectance method.

Click here to read the abstracts and these studies and more at ZeaVision's website.

**Conclusion: Value Proposition to Your Patients and Practice**

A *center for macular health* can offer your Baby Boomer patients the enhanced patient care they desire and deserve, and the annuity revenue streams from nutraceuticals and MPOD testing can have a dramatic effect on the financial performance of your practice as well.
About ZeaVision and EyePromise

Founded by Dr. Dennis Gierhart in 2001, ZeaVision developed its flagship nutraceutical brand, EyePromise, as a professional channel supplement that is evidence-based, doctor recommended, and made from only the highest quality ingredients. To date, more than 25 million doses of EyePromise have been safely consumed.

ZeaVision’s Eye-Q Intelligent AMD Risk Management Program allows ODs to perform MPOD testing using the QuantifEye instrument with more than 2 million eyes reliably and accurately tested. The program also includes the EyePromise brand of nutraceuticals.

For more information, visit www.eyepromise.com, contact us via email at support@eyepromise.com, or call us toll-free at 866-833-2800.