

How Macular Carotenoids Optimize Patient Care

In a Q&A session, Professor John Nolan discusses the latest evidenced-based research revealing the importance of prescribing macular supplements to patients.



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1. How can macular supplements benefit patients in the eye care practice from a protective standpoint?

Over the last two decades, we have learned about the possibility of using nutritional supplements to reduce the risk of age-related macular degeneration (AMD). Such a possibility is extremely important for eyecare, given the aging and growing population—and subsequent increases in AMD cases. In the US alone, more than 2 million people over the age of 50 have late AMD and 11 million people have some form of AMD.^{1,2} The idea that nutritional intervention could reduce risk of AMD was fueled by the original AREDS trial,³ which demonstrated a major (25%) risk reduction of AMD progression from intermediate to advanced AMD. However, since this trial was published in 2001, science and technology has progressed at an exceptional rate, and researchers have been able to identify the exact nutritional molecules that have been proven to reduce the risk of AMD and improve visual function, across all populations.^{4,5} These nutritional molecules are known as the macular carotenoids or macular

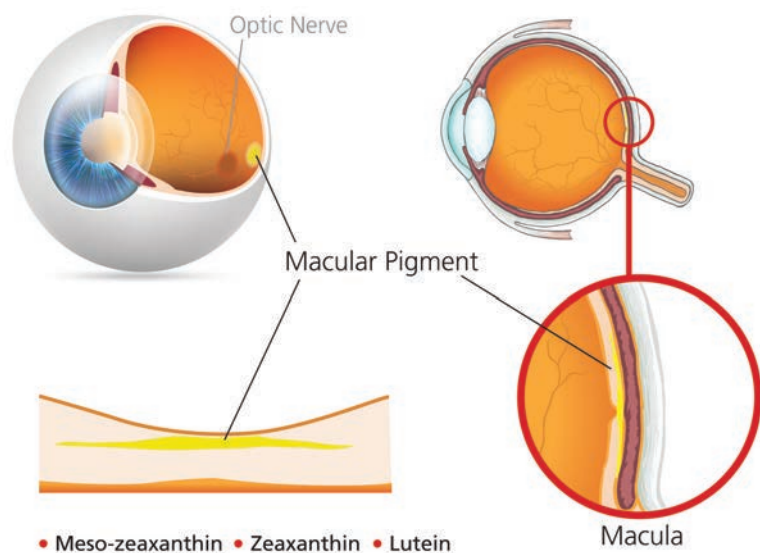


Image: John Nolan, PhD



The Macula & Macular Pigment. Macular pigment (MP)—which gives the macula its yellow color—is a term used to describe a collection of three dietary carotenoids located at the macula. These carotenoids—lutein, zeaxanthin and meso-zeaxanthin—are found in equal concentrations at the macula, with meso-zeaxanthin serving as the dominant carotenoid at the center of the macula.

pigment (meso-zeaxanthin, lutein and zeaxanthin).

Remarkably, these molecules are found in equal concentrations at the macula, and studies have demonstrated the importance of supplementation with all three carotenoids.⁴⁻⁸ The macula is the central 4% of the retina that mediates central and color vision. For optometrists, this evidence-based science represents a truly unique opportunity to not just reduce patients' risk of AMD, but to actually enhance visual function in healthy patients.⁴ The internal optics of the eye are optimized by enriching macular pigment, as the macula benefits by filtration of short-wavelength (blue) light by the yellow-filtering pigment. The health of the macula is also enhanced as a result of the antioxidant and anti-inflammatory properties of macular pigment. For the optometry practice, it is also important to utilize new technologies that allow for sensitive assessment of visual function and risk of retinal diseases. Data shows that successful implementation of these novel technologies greatly improves patient care and practice outputs.

2. Are there any findings to support the role of macular supplements in supporting or even optimizing patient vision and visual performance?

Yes, this is a very important question. We must not just consider nutritional intervention as something we should do when patients develop AMD. Remember, it is the antioxidant and light-filtering properties of macular pigment that enhance the health and optics of the macula, respectively; and this is important ever before AMD presents. The opportunity, therefore, is for all of our patients. This pigment is in the macula for visual function. When a mother breastfeeds, she provides the macular carotenoids to her baby. Nature does not do this to protect against a disease that presents in our sixties!

A number of key studies support the importance of macular pigment in maintaining or enhancing visual abilities that are important for visual performance. Research from the Nutrition Research Centre Ireland, Waterford Institute of Technology demonstrated that a daily nutritional supplement containing lutein, zeaxanthin and meso-zeaxanthin improved the visual performance of people with normal visual acuity and free of retinal pathology (CREST Normal Trial).⁴ In the one-year study, 53 adult subjects took a daily supplement containing 10 mg lutein, 2 mg zeaxanthin and 10 mg meso-zeaxanthin (commercially known as MacuHealth). Their visual performance outcomes were compared with those of 52 age-matched controls who took a placebo supplement for the same period. At the end of the 12 months, participants who had taken the carotenoid supplement showed significant improvement in contrast sensitivity. This improvement correlated with increased levels of macular pigment measured in the eyes after nutritional supplementation. It is important to

note that contrast sensitivity correlates highly with subjective visual performance, and therefore is a very good measure of visual function.⁹

In a separate trial known as CREST AMD⁵ (again with the 10:10:2 carotenoid formula plus the AREDS co-antioxidants—commercially known as MacuHealth Plus) over a 24-month intervention period, patients with the early stage of AMD exhibited clinically meaningful improvements in contrast sensitivity at the end of the study. This is a very important discovery because patients with early AMD typically experience a decrease in visual function; however, these findings identified a way to improve visual function in these patients.

3. What is the danger of not encouraging patients to supplement with macular nutrients such as lutein, zeaxanthin and meso-zeaxanthin in light of increasing use of digital devices and exposure to damaging blue light?

I would go as far as to say that eye care professionals must not just encourage patients to supplement with the macular carotenoids, but they must prescribe these supplements. Eye care should be driven by evidenced-based science and medicine. The evidence is now overwhelmingly directing us to fortify the retina with these key micronutrients. The yellow macular pigment is ideally located, and has the ability to neutralize free radicals and optimize the use of light and protect against damaging blue light. This is now more important than ever because we are living longer and exposed to significantly more blue light than ever before. Failure of the optometrist to implement macular pigment nutritional strategy in the clinic represents a danger and failure to the patient.

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