BEATING MACULAR DEGENERATION WITH NUTRITION

Empower Yourself With Nutritional and Lifestyle Principles for Healing

Gluten-Free, Food Allergy Friendly, Diabetic and "Normal" Recipes

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Hope

I once heard a speaker say that we can live a few weeks without food, a few days without water, a few minutes without air, but only a few seconds without hope. Hope is indeed essential to life, to living rather than just surviving or existing.

This is a story of hope. However, it did not begin that way. The message we originally received was, "Macular degeneration? We have new drugs for wet macular degeneration." This wasn't reassuring because we are very close to my aunt who has been treated with these drugs for over thirteen years and became legally blind during that time. No hope for her, just progressive loss of sight.

The week after my husband, Mark, was diagnosed with macular degeneration at a routine refraction appointment, he had an appointment with a retina specialist. She told us that his dry macular degeneration was already in the intermediate stage and gave us no hope except for telling us that when his condition progressed to the wet form of macular degeneration, there were drugs that could be injected into the eye that could slow the progress of the disease. This treatment option was devoid of hope for us because my aunt has taken (and still takes) over a hundred injections in her right (wet) eye and yet the disease progressed to a degree of blindness that makes it impossible for her to live independently at home. She is also legally blind in her left eye which is affected with advanced dry macular degeneration.

Our hope came from something I had heard eighteen years previously when my mother was diagnosed with early stage dry macular disease. I was listening when she was told by her allergy doctor, "There is an intravenous (IV) therapy protocol for macular degeneration that stops it in its tracks."[1]

One week after we saw the retina specialist, Mark had an appointment with a naturopath at a clinic that could give him the macular degeneration IV protocol. Rather than delaying giving Mark help while the clinic obtained the necessary solutions for the IVs, the doctor got him started immediately on eating an intensely nutritious diet. She even knew how to get foods he did not like into him. Her "Eye Smoothie" (recipe on page 87) contains kale and fish oil, and he doesn't mind them that way. He also began taking more supplements, getting more exercise, and drinking more water. When his blood tests results came back, his diet became even better for his eyes. His food choices were changed due to his hemoglobin A1c blood test result being in the pre-diabetes range. Our new goal became to protect his eyes from blood sugar surges

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1 Not every macular degeneration patient needs to take IVs to arrest the disease. Early stage dry macular degeneration, especially, responds well to an intensively nutritious diet and supplements. In *Save Your Sight!* ophthalmologists Marc and Michael Rose, MD, who treat macular degeneration with food and supplements rather than IVs, write, "We have seen hundreds of patients halt the progression of macular degeneration and dozens actually reverse it." Quote from: Rose, Marc R., MD and Michael R. Rose, MD. *Save Your Sight! Natural Ways to Prevent and Reverse Macular Degeneration.* (New York, NY: Warner Books, 1998), xii.

When the IVs began, he noticed a small improvement in some aspect of his vision every week. At first he noticed things at night such as a line of car headlights extending for miles while driving in the dark and the lighted railings at the water plant behind our house in the evening, which he thought were beautiful. The next week, he noticed that a family across the street had Venetian blinds on their patio door. He had never before detected the slats when light shone though the blinds in the evening. The following week headlights became *two* separate twinkling lights rather than one shining blur of light.

Then colors which he hadn't realized he wasn't seeing became intense and very enjoyable. He suddenly loved the color of a bright blue blouse that I'd had and worn in warm weather for two years. He hadn't realized that I owned a blouse that color before. Yellow traffic lights and school busses were bright orangish-yellow just as he remembered from elementary school years. The purple gem iris in our yard with white and bright orange or yellow markings in the centers were a delight to him. They had had bloomed unnoticed the previous spring.

The question that arose was, "Why is intensive nutritional treatment for macular degeneration almost unknown and rarely practiced?" I'm not sure there is a good answer to that question. Both eye doctors we saw initially recommended the AREDS™ formula supplement, which is woefully incomplete. (See more about this on pages 25 to 26). After they've told a patient to eat kale, salmon and egg yolks and take this supplement, their work on nutrition seems finished.

There is very little *good* nutritional advice for macular degeneration or diabetes to be found either in books or on the internet. It's all about eye injections, diabetes drugs, and American Diabetic Association diets that are so liberal and dependent on drugs that they almost insure that all diabetics suffer complications that lead to amputations, blindness, and heart disease.[2]

But take heart: there is hope! Macular degeneration does not have to be a sentence of progressive blindness. I fervently hope that this book will begin to remedy the lack of information on *real* (not AREDS™) nutritional treatment for macular degeneration.

Spread the word! Share the hope with everyone you know so they will have heard, "There is hope for macular degeneration" just as I had heard eighteen years before Mark's diagnosis. Then they will have that hope to help them explore the options in this book if they or someone they love is diagnosed with macular degeneration.

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2 "The target blood sugar ranges for people with diabetes listed by both the Joslin Diabetes Center and the American Diabetes Association go as high as 130 mg/dl for fasting blood sugar and up to 180 mg/dl after meals or snacks. It is these levels that lead to widespread damage in people with 'controlled' diabetes… Debilitating, life-altering repercussions are expected in people with diabetes who are being treated according to current standards." Quote from Carpender, Dana. *The Low-Carb Diabetes Solution Cookbook.* (Beverly, MA: Fair Winds Press, 2016), 14.

An Unexpected Diagnosis

About a year ago, Mark needed a new prescription to get safety glasses for work. I offered to accompany him just in case he decided to get his eyes dilated and would need someone to drive him home. True confessions: Both of us have had undilated eye examinations routinely so we could drive immediately after the appointment and get back to doing what we needed to do quickly. Mark's reply to my offer was that he didn't plan to get his eyes dilated but wouldn't mind having me along for company.

He had the refraction and got his new prescription. Then the doctor convinced him to let her dilate his eyes. Normally, when she looks inside the eyes with a hand-held ophthalmoscope, she looks and looks and looks at one eye, and then moves to the other eye and does the same. At this appointment, I was sitting behind her, facing Mark, and saw that she looked at one eye for just a few seconds and then quickly moved to the second eye and examined it for her normal amount of time. Then she returned to the eye she had first looked at and examined it thoroughly.

She said, "I'm glad you came in today. You have early stage dry macular degeneration."

We were both stunned. Mark's father was diagnosed with macular degeneration when he was ten years older than Mark was that day, and within a few months his dad could barely see. My beloved 94-year old aunt had moved to an assisted living facility eleven months previously to continue recovering from a fall. She had hoped to return home soon. However, she is legally blind in spite of having taken over 100 injections of drugs in her wet eye. She keeps taking the injections, although less often than initially, because she thinks her vision will be worse if she doesn't.

I was visiting her one day when the physical therapist came. We all went for a walk in the hall of her building. During one of our rests, she was talking, as she often did, about how much she wanted to go home to her dog. The therapist asked her, "What do you see when you look at my face?" She replied, "I can see the edges of your head, but not your features. He said, "It's not safe for you to go home because you might not see something on the floor and could trip and have another fall."

Because of our family members' experiences, when we heard the eye diagnosis both Mark and I knew, immediately and with certainty, how macular degeneration can devastate a life.

The doctor advised Mark to eat kale every day, salmon once a week, four egg yolks a week for lutein and take the AREDS™ eye supplement. (See pages 25 to 26 for more about the AREDS™ supplements). She also said he should see a retina specialist and gave us the names of two doctors nearby. I asked her if either of them was holistic. She said, "With dry macular degeneration, nutrition is the only thing you can do. They both are holistic because both will give you nutritional advice."

When we arrived at home, I made an appointment with the doctor she had recommended most highly and who had all five-star ratings on internet reviews. Her

patients praised her in the reviews for getting them in for treatment quickly in a crisis and said that her staff was very kind.

During the seemingly-long nine days between the routine eye examination and his appointment with the retina specialist, Mark and I discussed everything we had ever heard or had just read on the internet about macular degeneration. The most important thing we talked about was what I had heard about eighteen years previously. My 78-year-old mother had been diagnosed with early stage dry macular degeneration. She was taking allergy shots called EPD[1] which our son Joel and I also took. (We now take LDA, an Americanized version of the shots. For more information, see the footnote below). When she had a routine between-shots phone appointment with her allergy doctor, with me on another phone extension, she mentioned that she had just learned that she had macular degeneration. The doctor told her, "There is an IV protocol that stops it in its tracks. If it gets worse, you should take the IVs."

Mark's appointment with the retina specialist lasted more than two hours. First an assistant took a detailed health history, had Mark read the Snellen eye chart, and put dilating drops in his eyes. We sat in a mid-office waiting area while the drops took effect. Two types of scans followed. Finally we saw the doctor, and she gave us the results: Intermediate stage dry macular degeneration. Intermediate already? She gave us a handout with a list of foods he should eat including leafy green vegetables, with kale at the top as the best, salmon or other fish, and egg yolks and with information about the AREDS™ supplement. We asked her how fast Mark's macular degeneration might progress.

"Impossible to tell."

Did she have any other nutritional advice? We mentioned some information we had read.

"We have no evidence that any of those things help."

Mark said that he had been following a low glycemic index diet for several years. She said she did not think it would be helpful.

The one thing that she did know was that he should look at an Amsler grid daily with each eye, and if the lines looked wavy or a dark area appeared in the middle of the grid, he should call her as soon as possible during a weekday "but not at 4 pm on Friday afternoon." She would give him an injection of a drug in his eye within a few weekdays of his call. She gave us no real hope: she offered only the treatment that had failed to help my aunt.

It was time for Plan B. I Googled "IV therapy near me," and discovered a clinic 4.5 miles away. I called and made an appointment for an initial office visit. The receptionist told me that one of their doctors had experience in treating macular degeneration with IVs. I contacted the doctor who had told my mother about the IV protocol years before. Although retired, he emailed me the protocol within a few

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1 EPD stands for Enzyme Potentiated Desensitization. The Americanized version of EPD is LDA, which stands for Low Dose Allergens. For more about these treatments see www.food-allergy.org/epd.html and http://www.drshrader.com/lda_therapy.htm .

hours. One week after the seeing the retina specialist, with the IV protocol in hand, Mark had his first appointment with a naturopath.

She told us that she had worked with an MD who used a similar protocol for macular degeneration and that it worked well for stopping the progression of the disease. She also told me how to get plenty of spinach and kale into Mark, plus fish oil that he previously could not stand to take, plus plenty of anthocyanins from blueberries plus other nutrients – all via a smoothie. She said that the Occudyne™ supplement that Mark had switched to when we read about the AREDS™ supplement online and became disillusioned with it was a good, complete eye supplement. She also said that the nutrients in Occudyne™ and in the IV protocol were in safe amounts. We discussed supplements Mark was already taking and should take and she advised us about them. We discussed whole grains, green leafy vegetables, red, orange, yellow and purple vegetables, tomatoes, blueberries, omega-3 fatty acids and vitamin D. She also told me which brand of fish oil to purchase for palatability and where to buy it. She said Mark should drink half his body weight in ounces of water per day and that he needed to relax and let his parasympathetic nervous system function as much of the time as possible. He said, "I need to become less compulsive about work."

She gave us lab paperwork for a vitamin D blood test and a battery of other relevant tests. We left the office feeing hopeful and happy to have heard that there really is something that can be done to limit or stop the progression of macular degeneration and even prevent blindness.

Most of the advice she gave us was about nutrition. Although Mark's nutrition had improved quite a bit during 41½ years of marriage, his childhood had not been nutritionally ideal, so there was catching up to do. I started a "cooking frenzy," as Mark called it, which was therapeutic for me. We both began to learn more about what could be done to help Mark's eyes. What we learned and experienced is in the following chapters.

About Macular Degeneration

Macular degeneration is a progressive disease in which the center part of the retina, called the macula, gradually dies, initially a few cells at a time. In a chapter title of his book, one ophthalmologist author called macular degeneration "Starvation of the Retina." Nutrition is the key answer to macular degeneration because the disease really is starvation of this small part of the eye in a body that may seem well nourished but actually is not. This disease is often called age-related macular degeneration (AMD or ARMD) because its incidence increases with age.[1]

All macular degeneration starts as dry macular degeneration and may become wet (neovascular) macular degeneration if abnormal blood vessels which leak and/or bleed grow under, in, or over the macula. Wet macular degeneration may cause sudden severe changes in vision. Dry macular degeneration usually progresses more slowly but can be just as destructive if geographic atrophy (GA) develops. With geographic atrophy, regions of the retina waste away (atrophy) and die.[2]

Macular degeneration affects central vision but not peripheral vision, so it does not cause "total blindness," which means that no stimulus from light reaches the brain. However, it often causes "legal blindness" which is vision (with corrective lenses) of 20/200 or worse.[3] Macular degeneration can make reading, driving, watching TV, recognizing faces, many kinds of work, and living independently difficult or impossible.[4] AMD may cause the pleasures one intended to enjoy in later years to become only a dream.

A number of risk factors exist for developing macular degeneration. Age of over 60 years is a major risk factor, and the risk rises with increasing age. Family history of macular degeneration also increases risk, as do light colored eyes and Caucasian race. Other factors that are possibly more controllable are exposure to ultraviolet (UV) or high-energy blue light, cardiovascular disease, obesity, smoking, exposure to toxins and environmental pollution, and low blood levels of minerals and antioxidant vitamins such as vitamins A, D and E.[5]

The macula is the center part of the retina and is packed with light sensing structures called rods and cones. (For more detail about how rods and cones turn light into vision, see pages 23 to 24. Beneath the rods and cones is the retinal pigment epithelium (RPE), a membrane containing protective pigments derived from the diet. Beneath the RPE is the choroid, a layer that contains blood vessels. With age,

1 Buettner, Helmut, MD, Editor in Chief. *Mayo Clinic on Vision and Eye Health.* (Rochester, MN: Mayo Clinic, 2002), 137.

2 https://www.brightfocus.org/macular/article/what-geographic-atrophy

3 Buettner, 139.

4 Buettner, 137.

5 Rose, Marc R., MD and Michael R. Rose, MD. Save *Your Sight! Natural Ways to Prevent and Reverse Macular Degeneration.* (New York, NY: Warner Books, 1998), 18; Heier, Jeffrey S., MD. *100 Questions and Answers About Macular Degeneration.* (Boston, MA: Jones and Bartlett Publishers, 2011), 19; and Buettner, 142-143.

the RPE deteriorates and thins, thus lessening both the transport of nutrients to the macula and waste products out of the macula. The drusen seen in the eyes with macular degeneration are deposits of waste products. Dry macular degeneration is diagnosed based on the appearance of drusen. Furthermore, the thinning and deterioration of the RPE gives the retina a mottled look rather than a uniformly red appearance. In the final stages of advanced dry macular degeneration, the RPE may deteriorate to the point of no longer supplying the macula with nutrients or supporting its function in other ways, thus resulting in complete loss of central vision.[6]

Wet macular degeneration occurs in only 10 to 15% of cases but causes 90% of the incidents of severe vision loss. Macular degeneration becomes "wet" when new blood vessels grow from the choroid. These vessels leak fluid or blood and can cause sudden legal blindness. Patients are instructed to look at an Amsler grid daily to see if the lines become wavy or a dark spot develops, which means they are experiencing bleeding or leaking of blood vessels under the macula. Injections of anti-VEGF (anti-vascular endothelial growth factor) drugs into the vitreous humor of the eye may stop current bleeding but do not prevent the growth of new abnormal blood vessels.[7] Also, although the drug-treated blood vessels no longer leak or bleed, they are not functional. They become scar tissue which replaces normal tissue.[8]

What is the underlying cause of the eye's problem with disposing of waste products that initiates macular degeneration?[9] Lack of antioxidants in the diet[10] leads to oxidation in the eye that causes blockage of small blood vessels, resulting in decreased nutrient transport and waste removal.[11] When the lack of blood flow becomes severe enough, the body attempts to correct the problem by growing new blood vessels. However, the new vessels are very fragile and leak, bleed, or grow out of the choroid and over the macula.[12]

As with many chronic diseases, the most effective treatment is prevention or nutritional and other natural intervention early in the disease process. For advanced wet macular degeneration with actively bleeding or leaking blood vessels, conventional treatment with anti-VEGF drugs can help temporarily by stopping the bleeding. However, the drugs do not prevent new abnormal blood vessels from growing and leaking or bleeding nor do they prevent the formation of scar tissue. Thus, progressive destruction of the macula continues, although more slowly. In my opinion, individuals with macular degeneration can best improve their odds against blindness with excellent eye nutrition, ideally started before their macular degeneration has had much time to advance.

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6 Buettner, 139.

7 Heier, 49, 64.

8 Buettner, 142.

9 Buettner, 141.

10 Rose and Rose, 56-57.

11 Buettner, 142 and Rose and Rose, 56-57.

12 Buettner, 142.

How Rods and Cones Produce Vision

In the discussion of rods and cones earlier in this chapter, more information about how our eyes are "fearfully and wonderfully made" was promised. Here is the amazing story of how our eyes process light to become complex images of the world around us.

We first heard about the incredible function of rods and cones one night when both of our sons were eating dinner with us, and we were discussing Mark's improvements in color vision. Our older son, Joel, an electrical engineer whose dissertation subject was image processing, told us that he had learned in graduate school about how the human eye processes images. He said that our retinas are populated with rods and some cones that serve special purposes including detecting motion, lines, edges, etc. We have three kinds of color-detecting cones: short, medium and long. The short cones detect blue light, the medium cones detect green, and the long cones detect red. Although the detection of yellow depends mostly on the short cones, the signal sent from the retina to the brain for yellow is a combination of information from all three types of cones. We see yellow when the brain compares the signals from short (yellow/blue) cones to signals from long (red) and medium (green) cones.

Each rod or cone has a nerve coming from it. These nerves work together to combine and interpret the signals from nearby rods and cones to form an image, such as "red stationary object." These "processed" signals then travel to the brain and are transformed into a visual image there. In addition to detecting light, the retina is actually also a neurological structure, like an extension of the optic nerve into the eye, when it combines signals from various rods and cones to produce part of an image.

We learned more about this from a paper Mark found online titled "Detection of Early Loss of Color Vision in Age-Related Macular Degeneration – With Emphasis on Drusen and Reticular Pseudodrusen."[13] In addition to covering some of the information we heard from Joel, the paper said that the short yellow-blue (YB) cones are the fewest in number, comprising about 8% of the cones in the retina and less in the macula, ranging from a high of 5% across the outer parts of the macula to 0.5% in the center of the macula. Therefore, when macular degeneration patients are tested for color vision, as their vision worsens, they experience changes in yellow-blue color sensitivity first because the short cones are fewest in number, so the loss of just a few of them is more noticeable.

In this study, loss of yellow-blue color sensitivity preceded and was slightly greater than the loss of red-green (RG) color sensitivity. The patients with the highest loss of both yellow-blue and red-green color sensitivity were the most likely to

13 Vermala, Roopa, Sobha Sivaprasad and John L Barbur. "Detection of Early Loss of Color Vision in Age-Related Macular Degenration – With Emphasis on Drusen and Reticular Pseudodrusen." *Investigative Ophthalmology & Visual Science*. August 2017, Vol. 58, BIO247-BIO254.

have their disease progress rapidly to wet macular degeneration or to geographic atrophy, the advanced stage of dry macular degeneration.

In Mark's experience, as he was progressively regaining color vision with each IV he took, he noticed blue first after about three IVs. (Read about the long-owned but never noticed bright blue blouse on page 10). His realization that yellow traffic lights, center-of-the-street lines and school busses were bright orange-ish yellow rather than pale lemon yellow came next after five IVs. Then he became able to see more subtle differences in color, such as that most car headlights emit the warm yellow-tinged light color of incandescent bulbs but than LED headlights look blueish white. He also began to recognize a very light beige or cream color in places which he thought were white before.

We think that his eyes may have contained some short cones that were struggling nutritionally and therefore not functioning well, but were still alive. As they received high levels of much-needed nutrients with each weekly IV, they became more functional. The body's ability to heal is amazing! His experience tells us that as long as there is life left in a cone or rod in the eye, there is hope for recovery of its function with intensive nutrition. Thus there is hope for improvement in vision.

Treating Macular Degeneration

A variety of treatments exist for macular degeneration. Retina specialists usually treat wet macular degeneration by injecting the eye with anti-VEGF (anti-vascular endothelial growth factor) drugs to stop leaking or bleeding from small blood vessels in or under the macula. Currently, the two most commonly used drugs are Lucentis™ (ranibizumab) and Avastin™ (bevacizumab). Avastin™ was developed to treat colon cancer and is used off-label for macular degeneration. It is much less expensive than other anti-VEGF drugs. The oldest drug, Macugen™ (Pegaptanib sodium), is rarely used because it is less effective than Lucentis™ and Avastin™.[1] Newer drugs include Eylea™ (aflibercept) and Opthea™ (opt-302).

Anti-VEGF drugs do stop bleeding but because they do not prevent the growth of new abnormal blood vessels, patients need repeated injections. Blood vessels that have been clotted by the drug remain and may form scar tissue. When enough scar tissue forms, it can create a dark spot in the center of visual field.[2] Other treatments for wet macular degeneration include photocoagulation and laser surgery.[3]

There are no conventional treatments for dry macular degeneration. The advice conventional eye doctors give to patients with the dry form is to eat kale or other dark green leafy vegetables, salmon and eggs and take an AREDS™ (Age-Related Eye Disease Study) supplement for eye health. This supplement is favored because large clinical trials were performed with it. Conventional eye doctors seem to consider all other eye supplements inferior because their makers could not afford to sponsor large trials.

The AREDS and AREDS2 clinical trials showed that about 25% of subjects with intermediate stage dry macular degeneration had slower progression of their disease to the advanced stage. The AREDS™ and AREDS2™ supplements did not prevent macular degeneration, slow progression from the early to the intermediate stage, or slow the progression of the advanced stage of the disease to legal blindness.[4] When the results from the first AREDS study were analyzed by genotype, two genotypes comprising 31% of the study participants had a greater chance of progression than those taking the placebo.[5] There was no benefit as a result of taking AREDS™ in these patients and the trend was towards harm.

In the AREDS2 study, the amount of zinc in the formula was reduced to 25 mg. The AREDS2 formula slowed the progression of intermediate stage macular degen-

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1 Anshel, Jeffrey, OD and Laura Stevens, M. Sci. *What You Must Know About Age-Related Macular Degeneration.* (Garden City Park, NY: Square One Publishers, 2018), 25.

2 Buettner, Helmut, MD, Editor in Chief. *Mayo Clinic on Vision and Eye Health.* (Rochester, MN: Mayo Clinic, 2002), 142

3 Buettner, 145-146 and Anshel and Stevens, 145-146.

4 Heier, Jeffrey S., MD. 100 Questions and Answers About Macular Degeneration. (Boston, MA: Jones and Bartlett Publishers, 2011), 40-41.

5 Anshel and Stevens, 59 and "AREDS Eye Supplements: Helpful or Harmful?" https://www.macularisk.com/amd-pharmacogenetics/areds-eye-supplements-helpful-or-harmful.html

eration to the advanced state in about 25% of patients (like the original AREDS™ supplement) but also lacked positive results for prevention of progression at other stages. In spite of the equal results with the lower amount of zinc, the amount of zinc in the formula was kept at 80 mg. Dr. Jeffery Anshel, OD, and Laura Stevens, MSci, co-authors of *What You Must Know About Age-Related Macular Degeneration,* feel that the lower dose of zinc is appropriate.[6]

The original AREDS™ supplement (Bausch & Lomb's Preservsion™ AREDS Eye Vitamin and Mineral Supplement which is still sold) contains 500 mg of vitamin C, 400 IU of vitamin E, 15 mg of beta-carotene, 80 mg of zinc, and 2 mg of copper. For the AREDS2 study, the beta-carotene was removed from the supplement and lutein and zeathanthin were added. The AREDS2™ supplement (Bausch & Lomb's Preservsion™ AREDS2 Eye Vitamin and Mineral Supplement) contains 500 mg of vitamin C, 400 IU of vitamin E, 80 mg of zinc, 2 mg of copper, 10 mg of lutein and 2 mg of zeaxanthin.[7]

In *The Right Dose: How to Take Vitamins and Minerals Safely*, Patricia Hausman, MS, discusses a study which measured the HDL "good" cholesterol levels of men who took 80 mg of zinc per day for five weeks. This higher-than-usual dose of zinc reduced their HDL levels by 25%. For individuals with macular degeneration, the goal is to protect small blood vessels in the eyes. Since HDL helps remove deposits from blood vessel walls, lowering the blood level of HDL would seem counterproductive for health of the blood vessels in the eyes.[8]

In *The Eye Care Revolution*, ophthalmologist Robert Abel, MD says that the high level of zinc in AREDS™ inhibits the absorption of calcium, magnesium, selenium, chromium, vanadium and other minerals needed by macular degeneration patients. He also states that the copper which is added to AREDS™ to balance the high level of zinc reduces the clearance of Alzheimer's disease-associated beta-amyloid in the brains of mice. The mice also exhibited a four-fold increase in abnormal capillaries in the brains. This indicates that excess copper may increase the risk of Alzheimer's disease

At Mark's appointment with the retina specialist six month's after his diagnosis, the doctor told us about and gave him a sample of a new AREDS2 supplement, Systane I-Caps™ Chewable Eye Vitamin and Mineral Supplement AREDS2, which is made by Alcon/Novartis Pharmaceuticals. This supplement contains the reduced amount of zinc used in the AREDS2 study, 25 mg. It also contains 500 mg of vitamin C, 400 IU of vitamin E, 2 mg of copper, 10 mg of lutein and 2 mg of zeaxanthin.

In addition to the problems with the AREDS™ supplements mentioned above, there are a large number of nutrients that promote eye health but are not included in the AREDS™ supplements.[9] See the next page for the list of nutrients which oph-

6 Anshel and Stevens, 59.

7 Anshel and Stevens, 55, 57.

8 Hausman, Patricia MS. *The Right Dose: How to Take Vitamins and Minerals Safely.* (New York, NY: Ballantine Books, 1987), 390.

9 Abel, Robert, Jr. MD. *The Eye Care Revolution: Prevent and Reverse Common Vision Problems.* (New York, NY: Kensington Publishing Corp., 1999, 2014), 187 and Anshel and Stevens, 65.

thalmologists Marc and Michael Rose, MD recommend that their patients take. They say, "We're going to give you very detailed nutritional guidelines that we have seen prevent, halt, and sometimes even reverse the progress of macular degeneration... If you can commit to our Ten Steps to Restoring Vision and Vitality and the nutritional protocol for eye disease for at least nine months, you can almost certainly improve your vision. At the very least, you can keep it from getting worse."[10]

Nutritional treatments which are more complete than AREDS™ effectively address the causes of macular degeneration. Medical professionals such as naturopaths, who are specifically educated and trained to use nutritional methods, have much to offer for the treatment of macular degeneration – dietary advice, complete supplementation protocols and intravenous nutritional therapy. Since lack of nutrients reaching the retina is linked to the development of macular degeneration, comprehensive nutritional treatment actually addresses the underlying root problem rather than putting a temporary Band-Aid™ on symptoms as the anti-VEGF drug injections do. (To find a naturopath nearby, see "Sources," page 221).

Two of the pioneers of nutritional therapy for macular degeneration were Jonathan Wright, MD, and Alan Gaby, MD. They developed the Occydyne and Occudyne II™ eye supplements based on their experiences treating patients and they also gave more advanced macular degeneration patients nutritional IVs. Dr. Wright's Tahoma Clinic claims 70% effectiveness for stabilizing vision and reducing further loss in those with dry macular degeneration. In some cases even gains in vision are made.[11]

In *Save Your Sight!*, ophthalmologists Marc and Michael Rose recommend that macular degeneration patients take daily oral supplements containing:

Vitamin C – 2000 mg
Vitamin A – 10,000 IU
Lutein – 6 to 10 mg[12]
Zeaxanthin – 0.3 to 1 mg[12]
Magnesium – 300 to 500 mg at bedtime
Fish oil – 1 teaspoon, should contain rosemary, etc. to prevent rancidity
Vitamin E – 800 IU
Selenium – 200 mg
N-acetyl cysteine – 500 mg, on an empty stomach 2 to 3 times per day
Taurine[13] – 500 to 2000 mg between meals
Zinc – 15 to 30 mg
CoQ 10 – 30 to 200 mg

10 Rose, Marc R., MD and Michael R. Rose, MD. Save *Your Sight! Natural Ways to Prevent and Reverse Macular Degeneration.* (New York, NY: Warner Books, 1998), xiii.

11 http://tahomaclinic.com/2011/11/prevent-stop-or-reverse-vision-loss/ and http://tahomaclinic.com/treatment-for-dry-macular-degeneration/

12 Lutein and zeaxanthin are pigments that protect the macula.

13 Taurine is for blood vessel health. Take it separately from N-acetyl cysteine

Additionally, macular degeneration patients should have a blood test for vitamin D levels. If the result is low, supplement with enough vitamin D3 to bring the blood level to 50 to 60 ng/ml and maintain it there.

Two other nutrients that have benefited eye health in recent years since the publication of *Save Your Sight!* are bilberry and astaxanthin. Bilberry contains anthocyanins, improves capillary fragility, is anti-inflammatory, is a powerful antioxidant, and improves insulin resistance in diabetics. The recommended dosage is 50 to 125 mg taken twice a day.[14] For more about how the anthocyanins in bilberry and blueberries help insulin resistance, see the article cited below which is available online.[15]

Astaxanthin is the pigment that gives salmon its color. It is made by a species of algae called *Haematococcus pluvialis* which is consumed by krill, a microscopic crustacean, which is consumed by salmon. When choosing an astaxanthin supplement, look for one made from *H. pluvialis* because natural astaxanthin has significantly greater antioxidant capacity than if it is made in a laboratory from petrochemicals.[16]

Natural astaxanthin is the most powerful carotenoid antioxidant, is potently anti-inflammatory, crosses the blood-brain barrier and blood-retina barrier (making it especially helpful for macular degeneration), absorbs ultraviolet-B light (thus protecting the eyes from damage), and helps stabilize blood sugar, among other beneficial effects.[17] Recommended dosages range from 2 to 12 mg/day.

The Occudyne II™ eye supplement that Mark takes contains most of the nutrients listed above and also includes B vitamins and trace minerals including boron, chromium, manganese, selenium and vanadium. Mark's naturopath said Occudyne II™ was a good eye supplement and all the nutrients were at safe levels but that it was not a substitute for a highly nutritious diet, so it should be taken in addition to making dietary changes. "Food is best," she says. See pages 17 to 19 for her dietary recommendations for Mark. For recommendations from many sources, see pages 33 to 39.

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14 Anshel and Stevens, 72-73 and Bornsek, SM, L ziburna, et al. "Bilberry and blueberry anthocyanins act as powerful intracellular antioxidants in mammalian cells*."*
Food Chemistry, 2012 Oct 15;134(4):1878-84. doi: 10.1016/j.foodchem.2012.03.092. Epub 2012 Mar 30. https://www.ncbi.nlm.nih.gov/pubmed/23442633 The article may be requested here: https://www.researchgate.net/publication/235739688_Bilberry_and_blueberry_anthocyanins_act_as_powerful_intracellular_antioxidants_in_mammalian_cells

15 Stull, April J. "Blueberries' Impact on Insulin Resistance and Glucose Intolerance." *Antioxidants*. 2016 Dec; 5(4): 44. http://www.mdpi.com/2076-3921/5/4/44 (full text article)

16 Shah, Mahfuzur, Yuanmel Liang, et al. "Astaxanthin-Producing Green Microalga*Haematococcus pluvialis*: From Single Cell to High Value Commercial Products." *Frontiers in Plant Science*, 2016; 7: 531.Published online 2016 Apr 28. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4848535/

17 Mercola, Joseph, DO. "Astaxanthin: The Most Powerful Nutrient Ever Discovered for Eye Health." November 23, 2010. https://articles.mercola.com/sites/articles/archive/2010/11/23/astaxanthin-the-eye-antioxidant-550-times-more-powerful-than-vitamin-e.aspx

Mark's macular degeneration was diagnosed at the intermediate stage and his father went from diagnosis to being legally blind in a few months. Thus, in addition to excellent nutrition from food and supplements, he chose to have more assertive treatment with nutritional IVs. All potential problems with absorption are bypassed by the IVs and higher levels of nutrients than can be achieved by oral supplementation bathe the eyes with what they need effectively. The IV protocol he took is the most comprehensive of any I've seen. (Admittedly, I've only see descriptions of a few on the internet). It contains vitamin C, a multi-B vitamin complex, additional B-6 and B-12, magnesium, selenium, zinc, boron, copper, molybdenum, chromium, manganese, vanadium, lithium, strontium, and taurine.

Mark and I first heard about astaxanthin after he had completed treatment with nutritional IVs. He was very impressed with what he read, and I told him I could easily add it to his smoothies if he didn't want yet another supplement to swallow. Then I added it without mentioning it. On the fourth day after he consumed the first astaxanthin-containing smoothie, he saw something he had never before seen in the Magic Eye™ 3D image books he received as gifts several months previously. He discovered that the designs on the inside of the front and back covers of the books were also 3D images. He hadn't seen anything totally unexpected since the third month he took IVs so was wondering what changed. When I told him that I began adding astaxanthin to his smoothies a few days earlier, he was sure that was what made him able to see 3D much more easily. A week later, he looked at a Magic Eye™ image that is mostly shades of blue. He had never been able to make out a hidden object in this image before, but after about ten days of taking astaxanthin, an old Spanish sailing ship popped out at him. For more about all the improvements in vision he experienced, see pages 10 and 70 to 72.

Nutritional treatment for macular degeneration may succeed after conventional treatment has failed. In *Blind Faith*,[18] John Crittenden tells of consecutively taking injections of three different anti-VEGF drugs monthly for a total of nineteen months with no improvement in his vision. In fact, during this time, he became legally blind. Then, with his ophthalmologist's blessing and with assistance from a naturopath, he researched and worked out a diet and supplement protocol that restored his vision from 20/400 to 20/80 in eleven weeks. Upon examining his eyes, his ophthalmologist told him that he had never seen that kind of regeneration before, and said, "Keep doing what you're doing. You may change some minds."

I realize that this book is only one man's experience, but given a choice between legal blindness if you live long enough and making nutritional changes, does it not seem that nutritional treatment is worth a try?

Keep reading for more about how to implement nutritional changes and additional ways to help yourself.

18 Crittenden, John. *Blind Faith.* (2014).

Principles for Beating Macular Degeneration

The last chapter discussed ways to beat macular degeneration which included an extremely nutritious diet, supplements and, in addition, nutritional IVs for more advanced cases. Since macular degeneration is starvation of the retina[1], excellent eye nutrition is the cornerstone of beating macular degeneration. Supplements are easy to take, but consuming a diet of the right high-nutrient foods may be even more important. There are also a number of damaging factors, influences and substances to avoid and lifestyle changes that can help you beat macular degeneration.

The **first and most important principle** for beating macular degeneration **is to eat the best possible diet for eye health**. This has become less easy to do over the last several decades as giant agribusinesses have replaced small family farms and the use of many agricultural chemicals has become the norm. Chemical fertilizers are very limited in the nutrients they contain and do not produce plants as high in trace minerals and other nutrients as grocery store produce contained decades ago.

Our meat and dairy products have also changed. During our great-grandparents' days, all animals were raised naturally and humanely. The chickens and turkeys pecked the ground looking for bugs to eat and the cattle grazed on grass. This yielded meat, eggs and dairy products with healthy ratios of omega 3 to omega 6 fatty acids.[2]

Artificial foods such as trans-fats did not exist before the 1940s. Highly processed and convenience foods were also products of the early and mid-20th century.

Wheat was intensively hybridized from the 1940s through the early 1980s to produce high-yielding wheat that is easier to harvest and thresh. This modern wheat is also higher in types of gluten that are more likely to cause celiac disease or gluten intolerance;[3] hence the epidemic of these problems. To read more about this, see http://www.healingbasics.life/how-wheat-changed.html.

Unsurprisingly, the incidence of food allergies has also risen dramatically in the last 25 years. Although the FDA did no testing before approving GMOs and insists that they are safe, the timeline associated with the epidemic of peanut anaphylaxis in children casts grave doubt on the safety of GMOs.[4] In 1996, GMO soy, the first

1 Abel, Robert, Jr. MD. *The Eye Care Revolution: Prevent and Reverse Common Vision Problems.* (New York, NY: Kensington Publishing Corp., 1999, 2014), 170

2 Servan-Schreiber, David, MD, PhD. *AntiCancer: A New Way of Life.* (New York: Penguin Group, Inc.,2009), 73.

3 Davis, William, MD. *Wheat Belly*. (New York, NY, Rodale, Inc., 2011), 25-26; also Gao, X; Liu, SW, et al. "High frequency of HMW-GS sequence variation through somatic hybridization between *Agropyron elongatum* and common wheat." *Planta* 2010 Jan;23(2)245-50.

4 O'Brien, Robyn. *The Unhealthy Truth: How Our Food Is Making Us Sick and What We Can Do About It.* (New York, Broadway Books, Random House, 2009), 65.

GMO food the FDA approved, came into widespread use. Soy and peanuts are both in the legume family, and it is not unusual for a person allergic to one member of a food family to react to other members as well. In 1997, the incidence of peanut anaphylaxis rose by 20%. This rate of increase in the United State has continued every year to the present time. When my children were elementary school students in the 1990s, none of their classmates suffered from peanut anaphylaxis. Now one in thirteen elementary school children has peanut anaphylaxis, meaning there are on average two to three sensitive students in each class.

In 1998, GMO soy was introduced in the United Kingdom, and the rate of soy allergies rose 50% in 1999.[5] Although these examples may not constitute proof that consuming GMOs is unsafe, I personally do not want to develop more food allergies, so I avoid GMO foods. The current list of GMO foods in the United States includes soy, corn, sugar beets (beet sugar), canola (oil), cottonseed (oil), papaya, zucchini, yellow summer squash, some tomatoes, some apples (including non-browning apples), some potatoes (but not sweet potatoes or yams) and alfalfa. When you shop for these foods fresh, if you want to avoid GMOs, you must buy organic produce. For packaged foods, look for a logo that says the food is certified GMO free.

This book offers help for coping with the changing dietary demands modern life and food have given to an increasing number of people. Aside from a few wheat-containing breads, the **recipes here are gluten-free and food-allergy friendly**. Therefore, readers who have these dietary challenges can **improve their eye nutrition while adhering to their special diets and thus helping keep inflammation levels in check, which is important for limiting the progression of macular degeneration.**

The **second principle** for beating macular degeneration is to **protect your eyes from high levels of blood glucose**,[6] also called high blood sugar. Both the retina and lens of the eyes are adversely affected by high or widely fluctuating blood glucose levels. The chapter beginning on page 40 and appendix sections beginning on pages 177 to 195 will help macular degeneration patients with type II diabetes, pre-diabetes, insulin resistance or reactive hypoglycemia to achieve stable blood glucose levels. Ophthalmologists Marc and Michael Rose report that the majority of their patients with type II diabetes can achieve control of their blood sugar using diet, supplements and exercise.[7] All the carbohydrate-containing recipes in this book give carbohydrate units per serving to assist diabetics and others with blood sugar problems in planning their diets. Some recipes also give protein units to help individuals following the insulin resistance diet to link and balance protein and carbohydrate units in meals.

The **third principle** for beating macular degeneration is to **protect your blood vessels**. The choroidal capillaries in the macula are very small and can eas-

5 O'Brien., 66, 89-90.

6 Rose, Marc R., MD and Michael R. Rose, MD. Save *Your Sight! Natural Ways to Prevent and Reverse Macular Degeneration.* (New York, NY: Warner Books, 1998),112.

7 Rose, 115-116.

ily become clogged.[8] Wet macular degeneration develops when they bleed or leak. The chapter beginning on page 47 gives nutritional and lifestyle advice to help keep these capillaries in good condition.

The **fourth principle** for preventing or beating macular degeneration is to **protect your eyes from damaging light**. This includes ultraviolet light (UVA and UVB) and, according current sources, high energy blue light. The chapter beginning on page 50 explains how light damages the retina and provides information on nutrients and sunglasses that prevent damage.

The **fifth principle** for beating macular degeneration is to **avoid drugs that may damage the eyes**. The chapter beginning on page 53 tells how various drugs cause eye problems and lists drugs to avoid.

The **sixth principle** for beating macular degeneration is to **avoid toxins and eliminate them from your body**. Avoidance is covered in detail as is drinking sufficient water, a practice that will help clear your body of toxins. Other practices which may help eliminate toxins are also discussed briefly in the chapter which begins on page 59.

The **seventh principle** for beating macular degeneration is to **exercise**. Strenuous exercise is not needed. Moderate exercise such as walking will help your eyes and, especially if done outdoors in a natural area, can be enjoyable. Read more about exercise starting on page 65.

The **eighth principle** for being kind to your eyes and to yourself in general is to **pursue peace and promote dominance of the parasympathetic nervous system** (the "rest and digest" part of the nervous system), as opposed to the "fight or flight" sympathetic nervous system. This information begins on page 67.

At first, following the principles above may seem overwhelming. Getting help can make implementing them easier and optimize the effects of the changes you make. It may be beneficial to consult a naturopath, an expert in nutritional health treatment. Mark's naturopath ordered blood tests and spent considerable time talking to him to determine what he needed and how to personalize the principles here to produce the best results. To find a naturopath nearby, see "Sources," page 221, for a website that lists naturopaths by location.

Following these principles will promote better health of your whole body as well as your eyes. You have everything to gain and nothing to lose.

8 Rose, 56.

Progress

Progress is a difficult concept for macular degeneration patients. They are told that the best they can expect is for the disease to advance slowly and thus their eyes might serve them for activities such as dressing and walking for some time. Progress in a negative direction is monitored by high-tech scans, photos and self-administered tests of the eyes by having patients look at an Amsler grid daily.

The "Hope" chapter of this book (page 10) told of changes in Mark's vision that occurred during his first two months of weekly IVs. Because only negative change is expected, he had difficulty believing that his vision could possibly be improving. "I must be looking at things more closely and that's why I'm seeing this color," he often said. However, when some yellow objects such as traffic lights and lines down the center of roads began to appear orangish-yellow to him, he suddenly remembered a school-bus yellow truck he had spent hours playing with before he was kindergarten age. The realization that orangish-yellow *was* and still *is* the color that warns us "Be careful!" made the improvement in his vision seem more real.

Five months after he received the diagnosis of macular degeneration, we attended a concert. He decided to wear his old glasses because he was wearing dress clothes. His new glasses, made using the prescription he got at the eye exam where he first heard "You have macular degeneration," have safety side shields which he did not want to remove to make them suitable to wear to the concert.

Wearing the old glasses was "a shock," he said. He had been attributing improved ease of seeing his computer monitor at work to having a new prescription in his glasses. The evening of the concert, he was amazed that he could see very well with his old glasses. The change in his vision was not due to the new prescription: it was his eyes that had improved.

At that time, he had taken twelve IVs. He also had just had an appointment with a holistic eye doctor recommended by our dentist. The new eye doctor had a special camera to photograph the retina. She took photographs of his retinas and compared them to photographs taken by the retina specialist over four months previously.

"No change," she said, which is usually the best news possible for a macular degeneration patient. She also told us that she had been looking at retina photos for over thirty years.

The allergy doctor who many years previously told my mother about the macular degeneration IV protocol "stopping it in its tracks" was very pleased to hear about the improvements in vision Mark had noticed and that the retina photos showed no change. He recommended that Mark take the IVs every other week until his six-month appointment with the retina specialist. After that, if the report was also positive, he said Mark could take the IVs at monthly or longer intervals, but he should be taking zinc, selenium and taurine supplements daily. (See page 27 for more about these supplements including dosages). He also recommended

that Mark have a self-test[1] that would detect the beginning of possible deterioration in his vision. He said a self-test would reveal any deterioration in vision before the scans, photographs and examinations by eye doctors could detect the change.

As the six-month appointment with the retina specialist grew near, we both began to dread it because the first appointment had been so depressing. Mark's goal was to remain on good terms with the doctor so if he ever experienced a crisis and needed an anti-VEGF injection, she would take care of him quickly. Since she seemed very conventional, he decided not to tell her about taking IVs, etc.

On the day of the appointment, he first saw the same young assistant as on the previous visit. As part of taking Mark's recent history, he asked, "Have you noticed any changes in your vision?" Mark replied that he was seeing blue and yellow better and that he could see his computer monitor at work more easily. "But I did have a refraction before I first came here in December and got new glasses in January," he explained. However, Mark had disproved the "new glasses made the difference" theory to himself when he wore his old glasses to drive to the concert a month previously.

Our next stop was the mid-office waiting area. I whispered to Mark that I was surprised that he had mentioned seeing blue and yellow better and asked, "What are you going to tell the doctor if she asks you about why the improvement happened?" Before he could reply, a technician summoned him for eye scans and photographs.

When the tests were finished, we were ushered into the room where the doctor would examine his eyes and discuss the test results and her findings with us. After the examination, she looked at his test results on a computer monitor. Her back was to me and I could see the monitor. She studied the OCT (Optical Coherence Tomography) scan quietly. She asked Mark if he had ever smoked. He replied, "No, but my parents did and I got plenty of second-hand smoke growing up."

Then she examined a set of four color photos of Mark's retinas, each of which was a composite of photos taken from several different angles. She began making "Hmmm… hmm… hmmm… hmm… hmm" sounds as she clicked with her computer mouse. What was she seeing? The "hmm" sounds drove me to the verge of panic. I looked closely at the photos to try to determine what she saw. They all looked very similar aside from slight variations in color. The two upper images on the monitor were bright red with a small yellow spot in the middle of the cloud of orbs. The two lower images also contained a yellow spot (the macula) in the center and but were duller red and even grayish-red in some places.

She turned her chair to face him squarely and said, "Your macular degeneration is *definitely* stable. Whatever you're doing, *keep doing it!"* Then she replied to Mark's comment about his parents smoking and she told us about her childhood

1 Mark's self-test is paying attention to how easily he can see and work at his computer monitor at work. Before he began taking the IVs, he had to take his glasses off and put his nose close to the monitor, put them on, take them off, put them on, etc. all the time. If he ever cannot keep his eyes at a set distance from his monitor and work comfortably with his glasses on, he will know it is time to return to weekly IV treatments until his vision again improves. The doctor thought this sounded like a good self-test.

experiences with smoking. She described growing up on a farm in Iowa, her father smoking, giving her a puff of his cigarette when she was about ten years old, and how that experience "cured" her of smoking for life. However, her three siblings, who did not take a puff at an early age, all smoke now. She told us she'd recently found her bronzed baby shoes in her basement. They were part of an ashtray set and she had dropped the ashtray. Mark later said she was like a totally different person than she had been on our first visit. She seemed human instead of an aloof authority figure.

The next day, as I was mentally processing what had transpired at the appointment, I remembered having read that the color of a normal, healthy retina is bright red. However, with macular degeneration the color dulls and can become mottled.[2] Perhaps a change to a more normal retina color was what she had seen! I also realized that it must be very difficult for a doctor to have to tell patients terribly depressing news for most of the day every weekday. When she saw better-than-usual retina photos, she might have been so surprised that she lost her inhibitions and opened up to us. As we shared baby shoe and other stories, she became a real person under her white coat. By the end of our visit, we felt that we had begun to know her personally and she was learning about us. Without knowing why she saw what she saw, she gave us comfort.

Although she did not know what we had been doing, much of the "doing" happened in the kitchen where the next several chapters will take us. These chapters will make cooking easier than you may expect. Time in the kitchen will improve your nutritional status which is the most effective factor for improving outcomes with macular degeneration.

2 This information is on page 22.