

DRUSEN

Derived from German Mineralogy word describing speckles in Stone.

Retinal Pigment Epithelium cells continuously ingest photoreceptor outer segments that are shed throughout life. The residue of intracellular digestion may eventually fill the cell. The earliest clinical sign of Age Related Macular Degeneration is the development of drusen, which are extracellular deposits that lie between the basement membrane of the retinal pigment epithelium and the inner collagenous zone of Bruch's membrane. It has been suggested that apoptosis, a process by which cells cast off a part of their cytoplasm, may lead to drusen formation.

Drusen vary in size, shape, color, consistency, and distribution, although they are often bilaterally symmetric, clustered in the macular region, and tend to increase in number with advancing age. Histopathologically, retinal receptors overlying drusen usually show minimal evidence of degeneration, and, therefore, most patients with drusen have excellent vision and are asymptomatic. However, some patients with central drusen complain of mild metamorphopsia and decreased ability to read. Histochemically, drusen contain sialic acid and cerebroside. Drusen can be classified as one of several types: (1) hard (nodular), (2) soft, (3) calcified, or (4) basal laminar.

HARD DRUSEN

Hard drusen are small, round, discrete punctate nodules. They are believed to develop by the shedding of basal cytoplasm of Retinal Pigment Epithelium through its basement membrane. The material in hard drusen resembles the components of aging Bruch's membrane, containing coated, membrane bound bodies, membrane fragments, vesicles, and granular material. Hard drusen are probably the consequence of extrusion of material from one or a cluster of Retinal Pigment Epithelium cells. Dominant drusen refers to a dystrophy in which excessive numbers of hard drusen are seen in the macular area of younger patients. They tend to be bilaterally symmetric. These patients may be at increased risk for the development of SRNV later in life.

SOFT DRUSEN

Soft drusen are large, pale-yellow or gray, dome-shaped, occasionally confluent structures with indistinct margins. The material within the drusen is located beneath the Retinal Pigment Epithelium and may appear homogeneous and hyalinized, granular, or a combination of both. Soft drusen vary greatly in size and shape and are indicators of a general decline in cellular function. Clinically, angiographically, and histopathologically they appear identical to pigment epithelial detachments. Soft drusen have the poorest prognosis of all drusen.

Natural history of drusenoid pigment epithelial detachment in age-related macular degeneration: Age-Related Eye Disease Study Report No. 28.

Cukras C, Agrón E, Klein ML et al.

National Institutes of Health, Bethesda, MD, USA.

Ophthalmology 2010;117:489–99.

Editor's note: This is another study from the AREDS (Age-Related Eye Disease Study) cohort. Of 4757 patients enrolled in AREDS, 255 were identified as having drusenoid pigment epithelial detachment (PED) in at least one eye and ≥ 5 years of follow-up.

Drusenoid PED was defined as a fairly well-circumscribed, shallow elevation of the retinal pigment epithelium formed by a confluence of soft drusen, often located in the central macula. After 5 years of follow-up, advanced age-related macular degeneration (AMD) developed in 42%, with 19% progressing to central geographic atrophy and 23% progressing to neovascular AMD. Other aspects noted were progression to calcified drusen and pigmentary changes. Overall, 40% of eyes experienced reduction in visual acuity (VA) by ≥ 15 letters, with the mean VA decreasing from 76 letters at baseline to 61 letters at 5 years.

CALCIFIED (REGRESSING) DRUSEN

With time, drusen change in size, shape, distribution, color, and consistency. They may fade and disappear, or they may lead to localized areas of atrophy of the Retinal Pigment Epithelium. Once the Retinal Pigment Epithelium overlying the drusen fails, the drusen start to regress, assuming a whiter and harder appearance. This may be associated with pigmentary stippling. Some drusen become filled with cholesterol crystals and present a sparkling

appearance. They may become calcified as well as atrophic. Ultimately, drusen fade completely to leave multifocal patches of atrophy, although glistening calcium deposits may remain for years.⁷

BASAL LAMINAR DRUSEN

Bruch's membrane consists of five layers, the innermost being the pigment epithelial basement membrane, also called the basal lamina or cuticular layer. Hard and soft drusen cause a separation of the pigment epithelial basement membrane from the inner collagenous portion of Bruch's membrane. Basal laminar or cuticular drusen are focal thickenings of the basement membrane of the Retinal Pigment Epithelium. Although not impressive on clinical examination, these basal laminar drusen present a striking fluorescein angiographic picture of innumerable uniform, small, slightly raised, yellow nodules. Basal laminar drusen fluoresce early during angiography, corresponding to focal areas of Retinal Pigment Epithelium attenuation overlying the nodular thickenings.

PERIPHERAL DRUSEN

Although drusen are most commonly found in the macular region, they may be present anywhere in the fundus. Peripheral drusen are often surrounded by rings of pigment. This pigmentation may be confluent, linear, or radiating, producing a reticular pattern referred to as senile reticular pigmentary degeneration. There is a strong correlation between peripheral drusen and pigmentation and the macular changes of Age Related Macular Degeneration.

Treatment

It is not possible to remove the Drusen but the concern is that this may lead to age related Macular degeneration. There are a great deal of interest in antioxidant multivitamins for age related Macular degeneration in its early phase. Many people do take a selection of antioxidants to increase the antioxidant level within the retina in the belief that the free radicals that are released when light enters the eye and meets the photo receptors are more quickly dealt with and thus do not produce damage to the photo receptors of the eye. I recommend to all of my patients with age related Macular degeneration to take additional vitamin supplementation.

Age Related Macular Degeneration

Vitamin Supplementation –

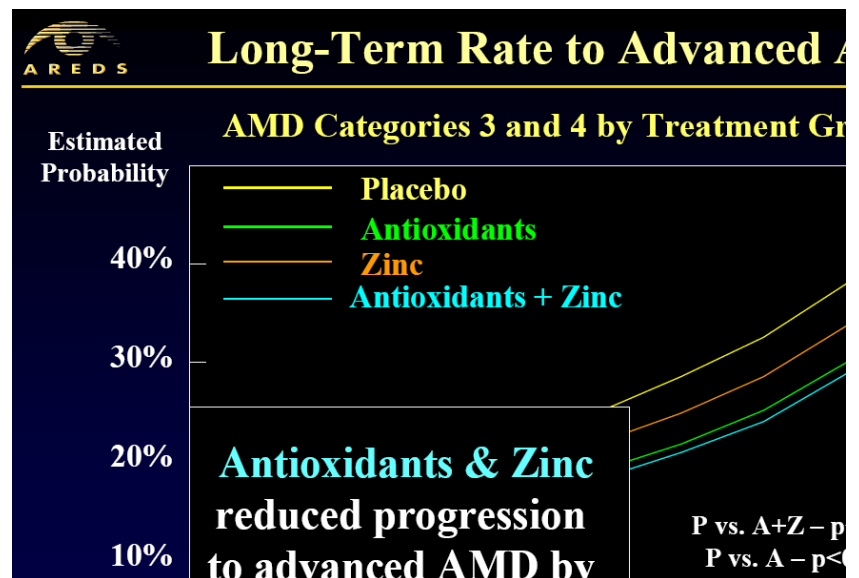
3 Types acting at different levels

1. Retinal Photoreceptor Protection

Results from the long-anticipated AREDS study, published in the October 2001 issue of Archives of Ophthalmology, show that taking supplements containing high levels of antioxidants and zinc significantly reduced the risk of advanced age-

related macular degeneration (AMD). This study has now been extended to 10 years with continued benefit, and a second study is under way. AREDS II will report in 2013 and is looking at the benefit for Omega3 and Lutein addition to the PreserVision Vitamins.

Minimum Protection is: OcuVite PreserVision Original Gels two a day is recommended for Age Related Macular Degeneration. (Not for smokers who should use OcuVite Lutein Gels.



Available from Chemists or on line from eg. www.chemistdirect.co.uk 0845 259 0175
Price around £14.00 is typical.

A Recent Royal College Of Ophthalmology Focus report recommends the use of AREDS Vitamin formulation ie OcuVite PreserVision.

Consider the following two as well.

2. OMEGA 3 Fish oils – Anti-Inflammatory

Increasingly interest in this area at present. These acids are mainly found in fish and nuts. These fatty acids have anti-inflammatory properties and may be anti-angiogenic, which may mean that they protect against the formation of the new blood vessels found the wet form of AMD. A number of studies have found a reduced risk of AMD in patients who have diets rich in omega-3 poly-unsaturated fatty acids. instance in the AREDS study there was a fifty percent



fatty

in

For

reduction in advanced AMD for the group who had the highest intakes compared to the group who had the lowest. It didn't take much of the omega 3 poly-unsaturated fatty acids to be effective because the highest intake group on average ate only one serving of broiled or baked fish a week. The National Eye Institute's AREDS 2 trial will also test if supplementation with omega 3 poly-unsaturated fats reduces the progression of Age Related Macular Degeneration

It will be a few years before we know the result. However it may be appropriate to take 1000mg of Omega-3 Oils in tablet form, as well as a diet rich in oily fish (Mackerel, sardines, Anchovies and Tuna). These can be bought cheaply from Chemist Direct (0845 259 0175) at 1.89 per bottle, or at local health food shops.

Do not however use Cod Liver oil as this contains vitamin A as well which you may well be taking in PreserVision Original Gels.

For Vegetarians there is Omega 3 From Flaxseed oil from Healthspan.co.uk on 0800 73 123 77

3. Lutein – Natural sunglasses

In addition Lutein 10mg & 2mg zeaxanthin is included in the AREDS II trial as well and is worth taking for maximal vitamin protection until we know the results of the trial.

Macushield is a Lutein and Zeoxanthin containing vitamin currently undergoing randomized trials. It has been shown to increase the levels in the blood stream. There has been recent publicity in the press over it.

It is a good source of Lutein and may be used in conjunction with PreserVision Original.

a unique supplement to support eye health

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MacuShield is a unique carotenoid eye supplement
 research institutions and endorsed by eye care

Scientists have long known that the yellow colour, or pigment, inside the macular comes from the carotenoids, lutein, zeaxanthin, and meso-zeaxanthin and believe these plant compounds help protect the eye by absorbing blue light and neutralising free radicals.

The patented blend brings together all three of these carotenoids (meso-zeaxanthin, lutein & zeaxanthin) to help maintain eye health throughout our later years.

...more
MESO-ZEAXANTHIN FORMULA
 Meso-zeaxanthin (10mg), Lutein (10mg), Zeaxanthin (2mg)

This formula combines powerful antioxidants that help reduce the damaging effects of free radicals and is designed specifically for the macula.

***Contains Meso-Zeaxanthin, the only carotenoid found exclusively in the macula**

ABOUT CAROTENOID SUPPLEMENTS
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Nature's Plus. The Energy Supplements.

Ultra MAXIMUM STRENGTH LUTEIN

100% PURE FloraGLO LUTEIN

60 SOFTGELS

GLUTEN Free

Nutritional Support for Healthy Eye Function.*

- Ultra Lutein® features FloraGLO™ brand lutein, an active carotenoid from the marigold flower.
- Ultra Lutein contains a full 20 mg lutein, the level that scientific studies document as providing effective antioxidant protection of the eyes.
- Ultra Lutein provides 860 mcg zeaxanthin to synergistically enhance antioxidant support.
- Ultra Lutein is ultra convenient: just one softgel daily!

Free from artificial colors and preservatives.
DIRECTIONS: As a dietary supplement, one softgel daily. **KEEP TIGHTLY CLOSED IN A COOL, DRY PLACE. KEEP OUT OF REACH OF CHILDREN.**

*FloraGLO™ is a trademark of Kemin Industries, Inc.

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Supplement Facts	
Serving Size 1 Softgel	
Amount Per Serving	
Lutein** (active carotenoid from marigold flower extract)	20 mg†
Zeaxanthin*** (active carotenoid from marigold flower extract)	860 mcg†
†Daily Value not established.	

Other ingredients: Gelatin, soybean oil, glycerin, beeswax, health purified water and natural color.

Map: 5487 Dlx, 112 Mill St, Richmond, VA 23234
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Another popular Lutein supplement Natures Plus Lutein from Marigolds which also has Zeaxanthin added.

Protect your eyes from direct sunlight by wearing UV Sunglasses/ shields and a brimmed hat/cap. Eg. Sunshield Wraparounds 100% UVA/B

Where to buy the vitamins?

- Ocuvite Preservision - Pharmacy
- Omega 3 - Supermarket / Health food shop/Pharmacy
- Lutein - Health food shop/ Pharmacy

