

Aging Eye Times

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Age Related Macular degeneration (ARMD) is a disease that causes progressive damage to the macula. Macula is the central part of the retina that allows us to see fine details. When the macula degenerates, people experience blurring or darkness in the center of their vision and tasks such as reading and driving are affected. The words on a page may look blurred, a dark or empty area may appear in the center of vision, or straight lines may look distorted.

There are two forms of macular degeneration

- **Dry** (atrophic) macular degeneration
- **Wet** (neovascular / exudative) macular degeneration

● Dry macular degeneration is the more common form of the disease and accounts for 90% of all AMD. The classic lesion in dry macular degeneration is [Geographic atrophy](#). Geographic atrophy of the macula causes severe central visual loss. There is no treatment, laser or other, that can halt or reverse the relentless progression of dry macular degeneration related vision loss.

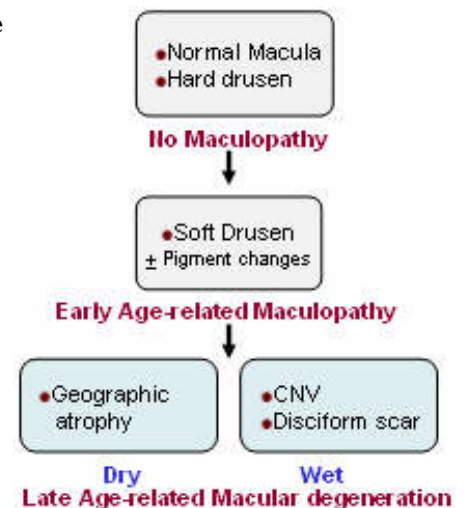
The precursor lesion that leads to the development of Geographic atrophy is a small yellowish macular lesion called 'drusen'. There are 2 types of drusen (soft and hard). [Soft drusen](#) are pale yellow and large with ill defined margins. In persons over the age of 55 years, soft drusen, particularly those larger than 63 micrometer, are a sign of age-related maculopathy. (Sixty-three micrometers is approximately half the width of a major retinal vein at the optic nerve head). [Hard drusen](#) (round, yellow with well-defined boundaries) are common in young people and are not considered to represent age-related maculopathy. It is the soft drusen, not the hard drusen, that evolves to macular degeneration.

● Wet macular degeneration form is less common but more severe than the dry form. It accounts for approximately 10% of all AMD but 90% of all blindness from the disease. This form is characterized by [choroidal neovascularization \(CNV\)](#), the development of abnormal blood vessels beneath the retinal pigment epithelium (RPE) layer of the retina. These vessels can bleed and eventually cause macular scarring which can result in profound loss of central vision ([disciform scar](#)).

To summarize:

- Early age-related maculopathy lesion is a [soft drusen](#).
- Late-stage macular degeneration lesion are 1). '[Geographic atrophy](#)' and 2). 'Neovascular lesions' which include [Choroidal neovascularization](#) and [Disciform scar](#).

Geographic atrophy represents 'dry' macular degeneration. Neovascular lesions represent 'wet' macular degeneration.



Risk Factors for Macular Degeneration

Strong Risk Factors

- **Aging**

Approximately 10% of patients 66 to 74 years of age will have findings of macular degeneration. The prevalence increases to 30% in patients 75 to 85 years of age.

- **Smoking**

The only environmental exposure clearly associated with macular degeneration is tobacco smoking. Not only does smoking increase the risk of macular degeneration development, current or ex-smokers cannot take the vitamin supplements that have beta carotene because the risk of lung cancer increases if they do so. Beta carotene vitamin supplements were recently shown to help in slowing macular degeneration in a NIH supported [study](#).

- **Family history** of macular degeneration

Macular degeneration appears to be hereditary in some families but not in others. Since macular degeneration affects most patients later in life, it is difficult to study successive generations in a family. Approximately one fourth of all late-stage macular degeneration appears to have a genetic basis. The lifetime risk of developing late-stage macular degeneration is 50% for people who have a relative with macular degeneration vs 12% for people who's relatives do not have macular degeneration, i.e a four fold higher risk. People who have first-degree relatives with late-stage macular degeneration develop macular degeneration at an increased rate at a relatively young age. (Arch Ophthalmol.1998;116:1646-51)

Possible Risk Factors

- Exposure to sunlight especially **blue light**
- Female gender
- Non-hispanic Whites
- Hyperopia (far sightedness)
- Hypertension
- Cardiovascular Risk Factors



Recently published data shows that persons with previously controlled hypertension (blood pressure less than 160/95) were approximately twice as likely, and persons with uncontrolled hypertension (blood pressure more than 160/95) were approximately thrice as likely, to develop wet macular degeneration than persons with normal blood pressure (Ophthalmology 2003; 110: 636-643). In the Age-Related Eye Disease Study persons with hypertension were 1.5 times as likely to have wet macular degeneration compared with persons without hypertension.

If your blood pressure is 140/80, that means your systolic blood pressure is = 140 and your diastolic pressure = 80. The pulse pressure is calculated as follows: systolic blood pressure minus diastolic blood pressure. Therefore in this example your pulse pressure would be 60 (140 minus 80). In general, higher systolic pressure and higher pulse pressure are associated with higher risk of wet macular degeneration. (The pulse pressure would be high if the systolic pressure is high and the diastolic pressure is low). Higher pulse pressure and lower diastolic blood pressure may therefore be markers for degenerative changes occurring in eyes that are at risk for wet macular degeneration development.

Physical activity like brisk walking, jogging, bicycling, etc., long enough to work up a sweat when performed regularly (more than 3 times a week) reduces macular degeneration. A sedentary lifestyle may result in obesity, which has been inconsistently found to be associated with macular degeneration.

Progression of Macular Degeneration

Drusen evolve from hard to soft. They increase in number, size, and confluence to eventually evolve to dry or wet macular degeneration. If, in addition, pigment changes occur in the retina, the risk of developing dry or wet macular degeneration increases considerably.

In general, the risk of developing macular degeneration (dry or wet) is strongly depended on the age and the stage of age-related maculopathy (i.e. whether you have soft drusen or pigment changes etc.). Therefore, a person who is 80 years or older and who has soft indistinct drusen and pigmentary changes has a very high risk of developing macular degeneration over the next 5 years. The 5-year risk of developing macular degeneration in such an individual is 42% (Arch Ophthalmol 2003; 121: 519-26).

As with macular degeneration, the risk of developing early maculopathy is also dependent on your age. If you have normal retina, then over the next 5 years the risk that you will develop retinal changes of early maculopathy is 0.7% if your age is less than 60 years, but the risk is 22.5% if you are more than 80 years of age.

If there is macular degeneration in one eye, then the fellow eye is at a high risk of developing macular degeneration as well. The risk of the fellow eye developing macular degeneration was reported to be 55% in the AREDS and 38.7% in the Rotterdam Study.

Comparing the data from different studies, it seems that the risk of developing macular degeneration is higher in the US as compared with the European population. There may be unknown genetic and environmental factors that play a role in producing this difference.

Dietary Fat & Macular Degeneration Risk

High fat intake is associated with an increased risk of macular degeneration in both women and men. Our diet contains two types of fat (saturated and unsaturated). Both types are associated with an increase in risk of macular degeneration. Surprisingly, even increased intake of polyunsaturated fats (the good fat), which have a protective effect against heart diseases, do not have a similar protective against macular degeneration. Recent research has shown that although increasing the intake of all types of polyunsaturated fats does not help in macular degeneration, preferentially increasing intake of one type of polyunsaturated fat and simultaneously reducing intake of another type of polyunsaturated fat does help. Linolenic acid (omega-3 fatty acid), which is a type of polyunsaturated fat found primarily in fish and flaxseed oil, is associated with lessening of macular degeneration risk, but only among individuals with lower intake of linoleic acid (omega-6 fatty acid). Therefore, intake of food sources with high linolenic acid (omega-3 fatty acid) and low linoleic acid (omega-6 fatty acid), as is found in Canola oil may help in macular degeneration.

Of the food sources, intake of beef, pork, or lamb as a main dish increases the risk of macular degeneration. More than 1 serving/week of beef, pork, or lamb as a main dish is associated with a 35% increased risk of macular degeneration as compared with less than 3 servings/month. A high intake of margarine is also significantly related to an increased risk of macular degeneration. People who eat fish more than 4 times/week have a lower risk of macular degeneration than those who consume it less than 3 times/month. This is especially true for Tuna fish. People who eat canned tuna more than once per week are 40% less likely to develop macular degeneration as compared with those who consumed it less than once per month. Fish is a major source of DHA (an omega-3 fatty acid).

Fat provides about 42 percent of the calories in the average American diet. A diet that derives closer to 20-25 percent of total calories from fat is probably healthier. Reducing fat intake to this level means cutting down greatly on consumption of red meats and dairy products such as milk, cheese, and butter. Eating more cold-water fish for their omega-3 fatty acid content (at least twice weekly), rather than red meats, may help macular degeneration patients. (References: Arch Ophthalmol.2000;118:401-4, Arch Ophthalmol.2001;119:1191-9, Am J Clin Nutr 2001;73:209-18)

Does risk of macular degeneration increase after cataract surgery?

Several large scale studies have assessed the association between cataract surgery and macular degeneration risk, but there seems to be no consensus on this issue. However, when data from the three major population based studies were pooled, the odds of having macular degeneration were found to be 1.7 times higher after cataract surgery than without cataract surgery (Am J Ophthalmol 2003; 135: 849-56).

There are several possible reasons for this increased risk of macular degeneration after cataract surgery. One possibility is that cataract and macular degeneration simply share one or more common risk factors or developmental pathways. With aging, a person develops both a dense cataract as well as macular degeneration, and therefore regardless of whether you have cataract surgery or not, the risk of having macular degeneration progressively increases. Another explanation is the "light hypothesis." In this hypothesis, removal of the cataract newly exposes the retina to certain wavelengths of light (or at greater intensity), damaging the retina and increasing the risk of macular degeneration. As most of the intraocular lens implants currently in use have ultraviolet-B blockers, the critical wavelengths are likely to be in the blue light region. Further investigations of this hypothesis is needed.

AgingEye Times recommendation: Although there are several unanswered questions about 'blue light' damage to the macula, based on the growing body of evidence, we suggest using appropriate measures to limit blue light exposure to the macula. There are 2 strategies one can use. The first is to increase the intake of green leafy vegetables and/or lutein & zeaxanthin supplements. These macular pigments filter the blue light as it hit the retina and therefore help to prevent macular damage. The second strategy is to wear 'blue blocking' glasses. The color that blocks blue is yellow, so blue blockers must contain a yellow tint. There are ready-made "NOIR" sunglasses that block blue and UV light with a variety of tints, including light yellow, dark yellow, amber, and plum. NOIR glasses are available as clip-ons, and as large plastic frames that fit over your regular glasses. You can also ask your local optical shop to make you a pair of UV and blue blocker glasses or add blue blockers to your existing glasses.

Reading Materials on Macular Degeneration

[AMD FAQ](#) [Ciba-Vision AMD Booklet](#)

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