

A photograph of fresh carrots on an orange background. A large bunch of carrots with green tops is tied together with twine and positioned at the top. Below it, a single carrot lies vertically next to a knife with a wooden handle. The text is overlaid on the top half of the image.

Eat Well AMD's Well

Knowing More about Age-Related Macular Degeneration
and Nutrition for Managing the Condition

As we advance in age, some of the more commonly known eye problems which may affect us include cataracts, dry eye, floaters, glaucoma and presbyopia. There is also another eye condition which may affect us as we grow older, and which we may not be familiar with: Age-Related Macular Degeneration (AMD).

WHAT IS AGE-RELATED MACULAR DEGENERATION?

At the back of each eye is a thin layer of nerve tissue known as the retina. The retina contains millions of light-sensitive cells that receive and process visual information. That information is sent to the brain via the optic nerve, which then creates the images we see.



The macula is part of the retina. Although it is only about 5mm in width, the macula is vital for our central vision and the majority of our colour vision. It allows us to pick out the fine details of what we see. The rest of the retina is responsible for our peripheral vision.

AMD is an irreversible condition where the macula deteriorates and results in the loss of our central vision, making it challenging for us to recognise faces and read. With enough peripheral vision, we may still be able to carry out certain daily activities, even with the loss of our central vision. However, for other activities where central vision is crucial, such as driving, these activities will likely be out of the question.

TYPES OF AMD

There are two types of AMD - wet AMD and dry AMD. The majority of AMD patients start with the dry form, which can eventually progress to the wet form.

Dry AMD occurs when the waste products of the retinal cells are deposited in the macula, resulting in a gradual breaking down of the light-sensitive retinal cells over time. This leads to a loss of vision. While there is no effective treatment for dry AMD, loss of central vision is typically slow for this condition, such that one's eyesight is generally preserved until the very advanced stages set in.

Wet (Exudative) AMD occurs when abnormal blood vessels develop under the retina. This can lead to fluid and protein leakage, or bleeding into the macula. Over time, a scar will develop and cause permanent vision loss. Vision loss from wet AMD tends to progress rapidly and is usually more severe than dry AMD. There are different types of treatment available and early treatment can help to slow down the progression of the disease.

SYMPTOMS

Dry AMD happens progressively over three stages: early, intermediate and advanced. At the early stage of dry AMD, there are usually no symptoms. In the intermediate stage, some patients may still experience no symptoms. Others may start to find that their central vision is blurry or distorted. They may also have difficulty seeing in low light.

At the advanced stage for both dry and wet forms, straight lines will appear wavy or crooked. Patients will often notice a blank patch or dark spot in the centre of their vision. They will find reading, writing or recognising objects challenging. Colours may also seem less vibrant than before.

If you or a loved one experience blurring of the central vision, it is highly advisable to visit an eye specialist for evaluation as soon as possible.

DIAGNOSIS

For the diagnosis of AMD, a comprehensive eye examination will be conducted by the eye specialist to check for AMD and other eye conditions at the same time. Eye drops will be administered to dilate or widen your pupil, allowing the retina to be examined. An early sign of macular degeneration is the presence of deposits under the retina, also known as drusen.



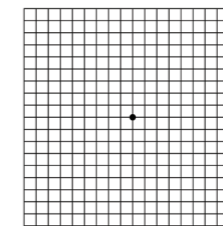
Consultation with Dr Clarissa Cheng

As with all vitamins and minerals taken at high levels, it can come with some risks. If you are considering health supplements that contain these various components, it is advisable to consult your eye specialist to discuss their suitability.

You may also need to undergo one or more of the following tests:

Amsler Grid Test

The Amsler grid is a diagram made up of multiple identical squares (resembling graph paper) with a central black dot.

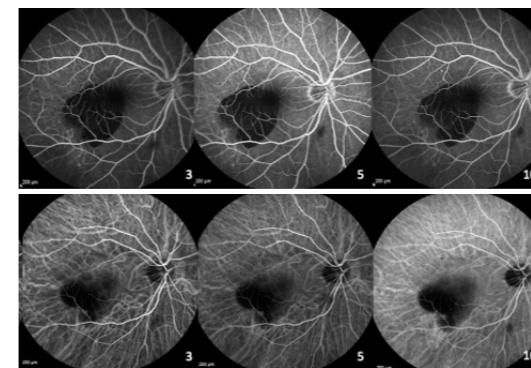


Amsler Grid Test

If someone has AMD, the Amsler grid may appear to have wavy or missing lines, or some parts of it may be missing or blurry.

Fluorescein and Indocyanine Green Angiography

A yellow dye (fluorescein) and green dye (indocyanine green) is injected into a vein in the arm. Within a short span of seconds, the dye will circulate within the body and reach the blood vessels in the eyes. Photographs will be taken and these images help the eye specialist to detect abnormalities or guide on where to focus treatment.



Angiography

Optical Coherence Tomography (OCT)

This is a non-invasive scan that uses light waves to generate cross-section images of the retina. This allows the eye specialist to measure the thickness of the retina's different layers.

Early detection of AMD is vital so that the best treatment option can be advised by your eye specialist.

TREATMENT OPTIONS

While there is currently no cure for AMD, treatments can help to slow the progression of the disease and prevent severe vision loss.

The following are treatment options for wet AMD:

Intravitreal Drugs

Anti-vascular endothelial growth factor (anti-VEGF) injections administered directly into the eye can help to prevent the growth of abnormal blood vessels that cause wet AMD. To be effective, multiple injections have to be done over a few months to control the disease activity and prevent severe vision loss.

Laser Photocoagulation

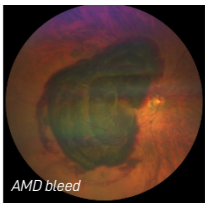
An intense beam of light is applied to seal off the abnormal leaky blood vessels in the eye to prevent more vision loss.

Photodynamic Therapy (PDT)

A non-thermal laser is applied together with an intravenous drug (Verteporfin) to seal abnormal blood vessels and thus slow the progression of AMD.

Surgery

In severe cases where there is a large bleed under the retina, surgical intervention may be required to quickly remove the blood away from the macula.



While there is no treatment for advanced AMD, low-vision aids can be prescribed to help people make the most of their remaining vision as these devices can produce enlarged images of nearby objects.

Nutritional supplements containing vitamins C, E, zinc, copper, lutein and zeaxanthin are also recommended for high-risk patients. These cannot restore vision, but they can help prevent the progression of dry AMD to the advanced stage, or development into wet AMD.

RISK FACTORS

There are some common risk factors for AMD that you may want to take note of. They include:

Age

AMD is one of the leading causes of vision loss for those over the age of 50. In Singapore, AMD is estimated to affect over 25% of the ageing population.

Genetics

If there is a family history of the condition, you may have a higher risk of developing AMD.

Gender

Women are more prone to developing AMD.

Health

Conditions such as cardiovascular disease, high blood pressure (hypertension), high cholesterol levels and obesity are linked with a higher risk of AMD.

Diet

A diet lacking in nutrients, especially vitamins and minerals found in vegetables, can increase the risk of AMD development. There will be a more detailed discussion on nutrition later in the article.

Smoking

Smokers have up to four times higher risk of developing AMD compared to non-smokers.



Sunlight Exposure

Long-term unprotected exposure of the eyes to bright sunlight results in a higher risk of AMD development.

PREVENTION/SLOWING DOWN OF AMD

Without any cure available for AMD at this moment, the best

course of action is prevention. We can prevent AMD by lowering our risk factors. This will hopefully slow down the development and progression of AMD.

Leading a healthy lifestyle by exercising, not smoking, protecting our eyes from harmful UV rays and eating the right foods will go a long way towards improving our eye health.

FOODS TO INCLUDE IN YOUR DIET

These are some important nutrients and foods which you should include in your daily diet for the prevention of AMD. They include:

Vitamin C

This is a powerful antioxidant that can protect your body cells, including those in the eyes, from damage by free radicals. Vitamin C is also required to make collagen, a protein that gives structure to your eyes. Oranges, grapefruit, strawberries, tomatoes, red and green peppers, broccoli and papaya are some foods that are high in vitamin C.



Vitamin E

Similar to vitamin C, vitamin E is also a potent antioxidant. Good sources of vitamin E include plant-based oils (sunflower, safflower, corn and olive), almonds, sunflower seeds, wheat germ, asparagus, avocados and pumpkin.

Zinc

Found in high concentration in the retina, research indicates that zinc from food and supplements could delay the progression of AMD, likely by preventing cellular damage. Oysters and seafood in general have more zinc per serving than other foods. Red meat, poultry, legumes, seeds, dairy products and fortified cereals can also provide you with zinc.

Lutein and Zeaxanthin

Lutein and zeaxanthin are found in the macula and retina, where they act as antioxidants and help to absorb damaging blue and ultraviolet light. Thus, increasing your intake of these nutrients can help to boost your eye health. Leafy green vegetables (kale, spinach, lettuce), broccoli, carrots and colourful fruits (blueberries, grapes, persimmons, raspberries, mangoes, etc.) are great sources of these two nutrients.

Omega-3 Fatty Acids

Docosahexanoic acid (DHA) is essential for the integrity of retinal cells as it promotes retinal development and repair. Salmon, mackerel, sardines and herring are some of the best sources of DHA. Flaxseed, chia seeds, walnuts and edamame are alternative sources. However, fatty fish remains the primary source for the omega-3 fatty acids that your body needs.

Supplements

The largest study on vitamins to date is the Age-Related Eye Disease Studies (AREDS2) where researchers found a combination of supplements including vitamin C, vitamin E, copper, zinc, lutein and zeaxanthin reduced the risk of AMD disease progression by up to 19% and/or vision loss by 25%. Your eye specialist may recommend AREDS2 supplements if you are at risk of developing advanced AMD or have other risk factors.

The AREDS 2 formula includes:

- 500 mg vitamin C
- 400 IU vitamin E
- 10 mg lutein
- 2 mg zeaxanthin
- 80 mg zinc
- 2 mg copper



As with all vitamins and minerals taken at high levels, it can come with some risks. If you are considering health supplements that contain these various components, it is advisable to consult your eye specialist to discuss their suitability.

SUMMARY

With an increased awareness that AMD is a leading cause of blindness, we should also realise the importance of early detection in slowing its progression and preventing severe vision loss from AMD. Keep in mind that eating a balanced and nutritious diet, coupled with leading a healthy lifestyle is beneficial for optimal eye - and overall - health. **PRIME**



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Dr Clarissa Cheng is a Senior Consultant Ophthalmologist with more than 10 years of experience in Ophthalmology. She was a recipient of the Gold Medal Award for the Ministry of Health Specialist Board Examinations and further honed her subspecialty expertise in Vitreoretinal surgery during her fellowship at Manchester Royal Eye Hospital in 2018. Prior to starting her own practice, she was a Consultant at Tan Tock Seng Hospital and Visiting Consultant to both Khoo Teck Puat Hospital and Woodlands Health Campus. She specialises in cataracts and complex retinal surgeries, such as retinal detachments, macular hole repair surgery, epiretinal membrane surgery, and scleral fixation of intraocular lenses. She also has extensive experience in the treatment of age-related macular degeneration, diabetes related eye disorders, and retinal vascular disorders.

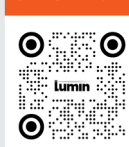
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