

Nutrition and eye health

A healthy diet is an important part of looking after your eyes.

This leaflet is available on audio CD.

**You don't have to face macular disease alone.
For the best information and support call us on
0300 3030 111.**

While the causes of age-related macular degeneration (AMD) are not fully understood, scientists believe factors responsible include age, genetics, smoking, exposure to sunlight and diet.

Why diet is important

Diet is thought to be important because certain nutrients protect the body from damaging substances called oxidants.

Oxidants are thought to be partly responsible for the ageing process. In the eye they may contribute to the

development of AMD by speeding up cell degeneration.

Antioxidants reduce this harmful effect. Vitamins A, C and E are antioxidants.

Carotenoids are also effective against oxidants. Lutein and zeaxanthin are important carotenoids.

Many of these substances can only be obtained from food.

Lutein and zeaxanthin are yellow plant pigments which give certain foods their colour. Lutein and zeaxanthin are found

in high concentrations in the macula. Another carotenoid, meso-zeaxanthin, is formed in the body from lutein.

These three carotenoids are known as 'macular pigment'. They are thought to play an important role in absorbing damaging blue wavelengths of light. They act as a natural sunblock for the macula and can counteract the effects of free radicals.

Some studies have suggested that people with low levels of macular pigment may be more likely to develop AMD. Some

people may have naturally low levels of macular pigment but weight and diet may also be factors.

The human body cannot make lutein or zeaxanthin. They have to be eaten. Several studies suggest that eating at least 10mg of lutein a day has the most beneficial effect on macular pigment levels. The average western diet is thought to contain no more than 3mg of lutein and zeaxanthin a day.

While it is important to eat a wide range of foods, the vegetables

that have the highest amount of lutein are:

Lutein in vegetables milligrams (mg)/100g (fresh)

Kale	11.4 mg
Red pepper	8.5 mg
Spinach	7.9 mg
Lettuce	4.7 mg
Leek	3.6 mg
Broccoli	3.3 mg
Peas	1.7 mg

Some studies suggest very light cooking may increase the bioavailability of lutein; that is the ease with which the body can absorb the lutein. It is thought too much

cooking may destroy it. Cooking with oil or fat may help with absorption into the body. However, research is ongoing.

Kale is the best source of lutein and has good bioavailability, even when raw.

Eggs contain lutein and zeaxanthin, and these carotenoids may be more easily absorbed by the body because they are eaten with the fat contained in the egg.

Zeaxanthin is also found in orange and yellow fruits and vegetables such as

sweetcorn and orange peppers. Many of these foods also contain vitamins C and E.

Nutritional supplements

There has been a lot of research into whether nutritional supplements can make up for the lack of lutein, zeaxanthin and other antioxidants in people's diets.

Two large studies, Age-Related Eye Disease Study AREDS1 and AREDS2, suggested that certain nutritional supplements can slow down the progression of AMD by about 25%.

AREDS2 in 2013 tested a modified version of the AREDS1 formula.

The AREDS2 formula:

Vitamin C	500mg
Vitamin E	400 IU
Copper	2mg
Lutein	10mg
Zeaxanthin	2mg
Zinc	25mg

Overall the new formula did not seem to reduce the progression of AMD any more than the original. However, some people taking the new formula did show a greater benefit. Studies suggest that you may benefit from an

AREDS2 supplement if:

- Your eye care professional has told you that you have many medium-sized drusen* or one or more large drusen in one or both eyes (you may have large drusen and still have good vision).
- You have wet AMD in one eye but good vision and dry AMD in the other.
- You have a diet low in fresh green leafy vegetables and fruit.

There is no evidence that a supplement will be beneficial if:

- You have been told you have early signs of AMD in one or both eyes (your eye care professional may say that you have several small drusen or a few medium-sized drusen in one or both eyes).
- You have advanced AMD in both eyes.
- You have active wet macular degeneration.

***Drusen are made up of cellular waste materials that collect under the retina. These white or yellow deposits are a common early sign of AMD.**

The AREDS2 supplements are not available on prescription.

Talk to your GP before taking supplements or making major changes to your diet, especially if you take other medications.

Some scientists believe that another macular carotenoid, meso-zeaxanthin, is also important for macular health. It is made by the body from lutein.

It was not tested in the AREDS trials and not all scientists agree on its significance. More research is needed in this area.

It is widely agreed that if you eat a healthy diet including at least five portions of fruit and vegetables a day, you should not need a supplement.



So, while supplements shouldn't be a substitute for a healthy diet, they may be useful in some circumstances.

Not all supplements have sound clinical research to support their claims. Beware of any which claim to 'cure' macular degeneration.

As lutein and zeaxanthin are fat soluble they may be more easily absorbed

when taken as oil capsules rather than tablets.

While we believe that taking supplements containing lutein may be beneficial to eye health, we do not endorse any brand.

People who take warfarin, for example, may need to avoid high doses of omega-3 as it thins the blood. Vitamins E and K may also interact with medicines like warfarin and aspirin.



Smoking

You should not take any supplement with beta carotene (vitamin A) if you smoke or have smoked as evidence suggests it increases the risk of lung cancer.



Smoking increases the production of the damaging free radicals. People who smoke are up to four times more

likely to develop AMD than those who don't, regardless of genetic risk.

See our Smoking and Sight Loss leaflet for further information. Speak to your GP about stopping smoking.

For research references visit [macularsociety.org/references](https://www.macularsociety.org/references)



Beating Macular Disease

Macular disease is the biggest cause of sight loss in the UK, with around 300 people diagnosed every day.

The Macular Society is the only charity determined to beat the fear and isolation of macular disease with world-class research, and the best advice and support.

To support people affected by macular disease now, the Macular Society provides a range of support, information and services:

The Advice and Information Service (0300 3030 111) is available Monday to Friday, 9am to 5pm. Alternatively, you can email help@macularsociety.org

Our **website** provides a wide range of information and resources for people affected by macular disease. You can also find out more about the services we offer. Visit it at macularsociety.org

Our network of over **400 Macular Society Support Groups** stretches across the UK. Each one offers

practical and emotional support for people with macular disease, from those living with it today.

We provide a free, confidential **Counselling Service** over the phone. Call the Advice and Information Service for more information.

Our Telephone Befriending Service pairs you up for regular telephone calls with another person with macular disease who knows what it is like to live with the condition. Calls can be about anything, and provide friendly support.

Our Treatment Buddies Service will connect you with someone else who has received treatment for macular disease to talk you through the process and any worries you may have.

Skills for Seeing training can help you with techniques to make the most of your vision.

Our Advocacy Service has been set up to help people with macular disease who are finding it difficult to access the treatment or care that they are entitled to. We also help friends, family and carers acting on behalf of people with macular disease.

Can we support you?

If you are living with macular disease or have recently been diagnosed, we are here to help. We can support you, whatever stage you are at. Try our **six months free membership**, which includes:

- Sideview, a magazine packed with news, research updates, inspirational stories, tips and advice, and our monthly e-newsletter.

To join, go to macularsociety.org/sixmonthsfree or call **01264 350 551**.

Macular Society

PO Box 1870, Andover SP10 9AD

01264 350 551

macularsociety.org

info@macularsociety.org



@MacularSociety



/macularsociety

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