



ILLUSTRATION: LAURA WOOD

Eyes right

Sight is one of our most treasured senses – so why isn't it the focus of more attention? Naturopath Tania Flack reports.

APPROXIMATELY 90 percent of vision impairment and blindness in Australia is preventable or treatable, according to Vision 2020: The right to sight Australia. This is our first truly national overview of eye health in Australia and it has highlighted some worrying statistics.

Eye impairment causes significant impact on quality of life and loss of independence for those more seriously affected. The annual economic cost of vision loss in Australia is estimated to be a staggering \$16 billion. Just a handful of conditions are responsible for over 80 percent of vision impairment in Australia, including cataracts, age-related macular degeneration, and diabetic retinopathy.

The lipid-rich structures and delicate microvasculature of the eyes are exquisitely sensitive to oxidative stress, which is a major contributing factor in many eye conditions, including macular degeneration and diabetic retinopathy. Oxidative stress increases as we age and it is impossible to eradicate completely; however, positive changes in diet and lifestyle, along with specific supplements for eye health can reduce oxidative stress. Much research done to date has found that powerful antioxidant herbs and nutrients are able to reduce the risk of damage to the eyes and preserve vision.

Age-related macular degeneration

This common condition is a leading cause of vision loss in people over the age of 50. It causes damage to the macula, which is the most sensitive part of the retina. This causes blurry, distorted vision, or dark spots in the centre of your visual

field, leading to vision loss. While the exact cause is poorly understood, we do know that ageing and oxidative stress play a role.

The protective benefits of antioxidant nutrients in age-related macular degeneration (AMD) have been extensively studied. The initial Age Related Eye Disease (AREL) study was conducted over several years, concluding in 2001, and investigated the effects of a nutritional formula in 3,640 participants between the ages of 55-80 years. The formula, containing vitamin C, vitamin E, beta-carotene, copper, and a high dose of zinc, led to a statistically significant reduction in the progression of mild to advanced AMD, which causes vision loss. This trial was so successful that the American Academy of Ophthalmology started recommending that patients with early signs of AMD take the formula to prevent further degeneration.

Despite the success of the formula there were concerns that the beta-carotene content may increase the risk of lung cancer in smokers and the high dose of zinc was associated with nausea in some sensitive participants, so another trial, called the AREL2 study, was conducted in 2006 to investigate alternative formulas. This five-year study involved 4,203 participants, who took an adapted version

The anthocyanins in bilberry protect the eyes against oxidative damage and have a regulating effect on blood glucose.

Foods for eye health

- **Lutein and zeaxanthin:** Egg yolk, corn, red capsicum, kiwi fruit, grapes, spinach, zucchini, yellow squash
- **Vitamin C:** Berries, citrus fruits, broccoli, Brussels sprouts, capsicum
- **Vitamin E:** Almonds, sesame seeds, pumpkin seeds, hazelnuts, green leafy vegetables
- **Zinc:** Oysters, beef, chicken, duck, pork, almonds, Brazil nuts, cashews, eggs, legumes
- **Essential fatty acids:** Sardines, salmon, mackerel, herring, oysters, prawns, crab, lobster, scallops, walnuts

of the original formula. The beta-carotene was removed and the powerful antioxidant carotenoids lutein and zeaxanthin were added, along with omega-3 essential fatty acids, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), a lower dose of zinc, copper, and vitamins C and E.

Lutein and zeaxanthin are the main carotenoids naturally found in the human retina; they are thought to protect the retina and macula against blue light and ultraviolet radiation by reducing oxidative stress. Although there is no specific recommended daily intake of these carotenoids, which are found in egg yolk and colourful fruits and vegetables, it is thought that the average Western diet provides approximately 1-3 mg per day, where the amount used in the trial was 10 mg of lutein and 2 mg of zeaxanthin. This study confirmed that the formula helped to prevent progression of AMD and the addition of lutein and zeaxanthin led to a further 10 percent reduction in risk. This formula is now available commercially and is recommended by ophthalmologists.

So while this is an essential supplement for people newly diagnosed with AMD, can these nutrients protect our eyes from oxidative damage and developing age-related eye problems? The research to date seems to support the use of essential fatty acids. An Australian study, called The Blue Mountain Eye Study, investigated the diet and lifestyle of 3,654 participants and found that consuming oily fish at least once a week significantly reduced the risk of developing AMD. Similar results were reported in the EUREYE study conducted in 2006, involving 4,753 participants. Hopefully further studies will investigate the preventive effects of lutein and zeaxanthin in younger, symptom-free people.

Cataracts

Cataracts are the leading cause of blindness worldwide. They are formed when the crystalline fibres in the lens of the eye become damaged as we age, by light exposure and oxidative stress. It is important to note, however, that children and even babies can develop cataracts, but these usually have congenital or hereditary causes.

Nutrition plays an important role in the development of cataracts. Two large studies conducted in rural China have demonstrated that simple multivitamin and multimineral supplements were able to reduce the prevalence of cataracts significantly, up to 36 percent for persons aged 65-74 years. It is important to note however that this population would have had limited access to nutritious food; so simple supplementation to prevent nutrient deficiencies achieved a good result. The average Australian should be eating a nourishing diet, rich in micronutrients to support eye health, and if so, they will most likely reduce their risk of cataract formation. However, many

Australians are overfed and undernourished, and this may contribute to cataract risk. Interestingly, data collected during the AREDS trial on cataract formation found that the antioxidant formula did not reduce cataract risk. So at this stage the evidence supports general healthy nutrition to prevent cataracts.

Diabetic retinopathy

Uncontrolled blood sugar levels cause diabetic retinopathy by damaging the delicate microvasculature and neurons of the retina. Sadly this is a common cause of blindness. The best way to prevent diabetic retinopathy is careful management of blood glucose levels. Focusing on a diet that's rich in antioxidants, plant foods and soluble fibre, and low in sugar and processed foods, will support healthy blood sugar levels. Regular weight-bearing exercise is also vital. People with type I diabetes need to have their blood glucose levels and eye health regularly monitored, as the longer you have diabetes the greater the risk of developing retinopathy.

Type II diabetes can, in some cases, be successfully reversed with dietary and lifestyle interventions. Professionally supervised intermittent fasting can achieve significant improvements in blood glucose control over a short period of time. The nutrients alpha-lipoic acid, inositol, chromium, and magnesium can also be used to improve glucose control. Herbs traditionally used to treat insulin resistance and non-insulin dependent type II diabetes, such as gymnema, bitter melon and goat's rue can make a great impact on blood glucose control. These need to be professionally prescribed by your naturopath or herbalist.

The powerful antioxidant herb bilberry has been traditionally used in Europe since ancient times to improve eye health. Its use was recorded by the famous herbalist Dioscorides, in his *De Materia Medica*, first published around 50-70 AD. It is rich in powerful antioxidants called anthocyanins, which are the pigment responsible for the purple colour of the berries. The anthocyanins in bilberry have been shown to protect the eye against oxidative damage, and in vitro and in vivo studies have shown that it also has a regulating effect on insulin and blood glucose. In fact, the protective effect of anthocyanin in diabetes is so successful it has been used in anti-diabetic medications, including Arfazetin and Mirfazin.

Oxidative stress plays a critical role in the initiation and promotion of metabolic syndrome, which is characterised by elevations of blood glucose, cholesterol, blood pressure and midline weight retention. It increases the risk of cardiovascular disease, type II diabetes, associated retinopathies, cataracts, and other degenerative diseases. A randomised, double-blind, placebo-controlled study, involving 61 participants with metabolic syndrome,

investigated the efficacy of a combination of bioflavonoids. The participants received either 400 mg per day of the extract containing equal parts French maritime pine bark (Pycnogenol), bilberry anthocyanins and grapeseed, citrus, and red wine bioflavonoids, or a placebo, over two months. It was found that blood glucose levels were significantly lowered and all other major cardiovascular and metabolic risk factors improved.

Dry eye syndrome

Dry eye syndrome (DES) is caused by a chronic lack of lubrication and moisture on the eyes' surface, which leads to redness, discomfort and irritation; in severe cases, this can cause corneal damage and scarring. It is a common eye complaint, and is associated with many conditions, like tear duct dysfunction, allergies, pregnancy, or the autoimmune disease, Sjogren's syndrome. Some medications can also cause DES, such as antihistamines, blood pressure medication, or antidepressants.

Changes to tear quality and irritation to the eye surface can make the eye more susceptible to bacterial colonisation, which leads to further inflammation. Omega-3 essential fatty acids have been shown to support healthy tear production and improve tear quality, to reduce evaporation. Docosahexaenoic acid (DHA), a component of omega-3 essential fatty acids, is found in high concentrations in the brain and eyes, playing a critical role in the health of cell membranes.

Several studies have examined the effect of nutritional supplements in DES. One investigated a formula similar to that used in the AREDS trials, and while this achieved significant improvement in DES symptoms, other studies using essential fatty acids alone achieved equal benefits, so it's likely that this is the beneficial nutrient to treat DES. An essential fatty acid supplement containing 350mg of DHA twice a day, over three months, has been shown to achieve best results.

Eye strain and poor night vision

Herbal medicine has traditionally been used to treat simple eye conditions, such as general eyestrain and poor night vision. Sitting for hours before a computer screen and holding your focus at a fixed distance can lead to eyestrain, which can cause headaches and make it difficult to refocus your eyes after a long day at work. Poor night vision is common in people with cataracts and myopia (nearsightedness). True night blindness is a symptom of more major eye problems, like the genetic condition retinitis pigmentosa or major vitamin A deficiency, which is rare in Australia.

Although bilberry was traditionally used for eye infections, it wasn't until World War II that its beneficial effects on eyesight became well known. Legend has it that pilots in the British Royal Air Force regularly ate bilberry jam and claimed it made a vast improvement in their night vision, so it was credited as being the key behind their accuracy



The lens of your eye doesn't renew itself like other tissue, so damage caused by oxidative stress and ageing is permanent. Focusing on prevention is the best way to ensure eye health.

during bombing raids. A randomised, double-blind, placebo-controlled study has investigated the effects of high dose bilberry anthocyanins on myopia and night vision. Sixty participants were divided into two groups, with the treatment group receiving a 100 mg tablet comprising 85 percent anthocyanins daily. Measurements of nocturnal visual functioning using contrast sensitivity and clinical symptoms were taken before and after the treatment period. It was found that 73.3 percent of the treatment group showed improvement in symptoms and significant improvements were shown in contrast sensitivity (night vision). The results demonstrated that high dose anthocyanins were able to significantly improve night vision.

So if you or a family member have eye problems, a diet rich in antioxidants and micronutrients to help protect your eyes is the best place to start. Regular exercise will help promote healthy blood sugar control and protect against type II diabetes. Regular monitoring of eye health by your ophthalmologist is vital to detect early changes. If you have established eye problems and would like advice on how to support your eye health with nutrition, antioxidants and herbal medicine see your local naturopath for professional advice. *

Tania Flack is a respected Australian naturopath.
www.taniaflack.com (References available on request.)

* Eye essentials

- Never smoke, and avoid sidestream smoke from smokers
- Enjoy a diet rich in colourful vegetables
- Ensure a high intake of antioxidant foods
- Practise weight-bearing exercise daily
- Maintain a healthy weight
- Have regular check-ups with your ophthalmologist
- Reduce chemical and pesticide exposure
- Avoid fried food