6 things every serious reader should know

1. The science of the older eye
   As our eyes age, we need to consider light in different ways. Read our summary of how you should plan your lighting to take senior status into account...

2. Eye conditions and lighting
   We are prone to an increasing number of eye conditions as we age. Read a round-up of the four most common conditions and how lighting is relevant to them...

3. Nutrition & your eyes
   You are what you eat, and you can quite literally see the benefits. Take a look at the key ways in which diet can affect your eyesight, and discover the eyesight “superfoods”...

4. Daylight & vision
   We've all experienced the urge to move closer to the window when reading – and now scientific research shows us that daylight and myopia could well be related. Read on...

5. Eyecare in a digital age
   As society moves towards online reading, we take a look at how you can protect your eyes from the negative impact of a life spent screen gazing...

6. Protecting your eyes
   There are practical steps that everyone can take to protect their eyes. We give you two top tips to ensure your eyes last as long as you do...
**1. The science of the older eye**

**Age and your clarity of vision**

Our eyes are the gateway to the world. Depressingly, science confirms that even healthy eyes suffer natural deterioration with age. You may have noticed things becoming somehow blurred and dim, detail less defined? Age-related conditions also take their toll. Macular degeneration, cataracts, presbyopia, glaucoma – all of them can darken our world and prevent us enjoying a range of activities dependent on clear sight.

As you age, muscles that control your pupil size and reaction to light lose strength. Because of these changes, people in their 60s need three times more light for comfortable reading than those in their 20s. In addition, colour vision cells in the retina decline in sensitivity as we age, causing colours to become dull and the contrast between different colours to be less noticeable.

While there is no substitute for a professional eye examination, bathing the right part of your eye in the right kind of light can make a dramatic difference. When choosing lights for older eyes, you need to bear in mind these four critical points:

1. **More Light Is Required**

Less light reaches the retina in an aging eye than it does in a younger eye. First, pupil size reduces with age so less light enters the eye. Second, the lens, which is normally clear in a young person, yellows and thickens with age, also impeding the transmission of light. The result is that a 60-year-old receives only about 40% of the same amount of available light as a 20-year-old. An older person, therefore, may see poorly under dim conditions, and lose both acuity and contrast sensitivity.

It is also difficult for an aging visual system to adapt quickly to dramatic changes in brightness. Even within a single space, it may be hard to see darker areas if other surfaces are much brighter. A general, or “ambient,” light should therefore assure that there are no dark areas in a space. The space should also be bright enough to allow for good visibility so people can move around. In addition, light needs to be available for tasks requiring the ability to see and distinguish detail. The finer the detail of the task, such as counting money at a cashier’s counter, cooking on the stove or reading, the more light is needed.
2. Glare Reduction Is Vital

It is not just a matter of providing more light overall and extra light in task areas. The older eye can become increasingly sensitive to glare, making higher light levels uncomfortable, even disabling in extreme cases. Typically, older people experience glare because their lenses thicken and develop cloudy patches, so light is absorbed and scattered across the retina, making the image less clear. Glare is felt most acutely when a bright object is seen against a dark background. A bright light source well-shielded from view may provide good lighting in a room and minimize the risk of glare (for example indirect lighting located in architectural features such as soffits or coves, and fixtures which have shielding features). Highly reflective surfaces such as white walls and ceilings maximize and balance the light in space, effectively “washing out” severe shadows.

3. Contrast Makes a Difference

Contrast sensitivity often declines with age, so increasing contrast encourages the eye to recognize and distinguish edges. A stair tread with a contrasting-colour stripe, for instance, may provide a measure of safety for someone who may not see the edge of the stair. In the same way, bold signs with a contrasting colour background are easier to read.

4. Colour is Everything

The older eye frequently loses some colour sensitivity. Good colour-rendering lamps will enhance the colour discrimination that remains. Incandescent lamps, including halogen, render colours particularly well. The Serious high Definition Light renders colours to 99% of natural daylight, more than any other reading light.

Daylight Wavelength Technology™
There is nothing quite like daylight – we’ve all experienced the urge to move closer to a window to see better. Serious lights replicate aspects of natural daylight for which our tired eyes yearn. Good lighting is not a question of brightness alone. What really makes the difference is projecting a spectral power distribution akin to natural light. Colour Rendering Index (CRI) is a measure of natural light simulation, with 100 considered perfect. Our High Definition lights project a CRI of 99, making them the best for seeing colours in their true light.
2. Eye conditions and light

A look at the 4 most common eye problems

What is the relationship between the most common eye conditions and light? Here is a round-up of four common diseases affecting your eyes as they age:

1. Macular Degeneration

Macular Degeneration is deterioration of the Macula by exposure to too much of the wrong sort of light. A built-for-purpose, bright task light can offer enormous relief and renewed clarity. AMD causes problems with your central vision, but does not normally lead to total loss of sight and is not painful. It affects the central part of your vision when you’re looking directly at something, for example when reading, looking at photos or watching television. AMD may make your central vision distorted or blurry and, over a period of time, it may cause a blank patch at the centre of what you can see. The Serious High Definition light range has been designed specifically with AMD in mind and the light engines project lower than normal levels of the light wavelengths that are unhelpful when you have this condition.

2. Glaucoma

Glaucoma is the name given to a group of eye conditions which cause optic nerve damage and which can affect your vision. Glaucoma develops when pressure builds up in the eye's inner liquid (Aqueous Humour). Any damage to the optic nerve at the point where it leaves your eye will have a negative effect on the clarity of your view.

3. Cataracts

Cataracts are a very common eye condition. As we get older the lens inside our eye gradually changes and becomes less transparent (clear). A lens that has turned misty, or cloudy, is said to have a cataract. Over time a cataract can get worse, gradually making your vision mistier. Projecting a strong quality light onto your reading means that much more light makes it through to the retina so you can see more clearly.

4. Presbyopia

Presbyopia is long-sightedness caused by loss of elasticity of the lens. Projecting a strong quality light onto your reading means that much more light makes it through to the retina so you can see more clearly.
Serious Readers
Brighter by Design

Retina
Colour vision cells in the retina decline in sensitivity as we age, causing colours to become dull and the contrast between different colours to be less noticeable. Serious lights render colour better than any other.

Sclera

Macula
Macular Degeneration is deterioration of the Macula by exposure to too much of the wrong sort of light. A built-for-purpose, bright task light can offer enormous relief and renewed clarity.

Optic Nerve

Cornea

Cataracts are a clouding of the eye's lens often resulting in dim vision. Presbyopia is long-sightedness caused by loss of elasticity of the lens. Projecting a strong quality light onto your reading means that much more light makes it through to the retina so you can see more clearly.

Serious lights render colour better than any other.

Pupil
As you age, muscles that control your pupil size and reaction to light lose strength. Because of these changes, people in their 60s need three times more light for comfortable reading than those in their 20s.

Aqueous humour
Glaucoma develops when pressure builds up in the eye's inner liquid (Aqueous Humour), often resulting in damage to the optic nerve. Any damage to the optic nerve will have a negative effect on the clarity of your view.

Iris

Serious lights render colour better than any other.

Macula
Macular Degeneration is deterioration of the Macula by exposure to too much of the wrong sort of light. A built-for-purpose, bright task light can offer enormous relief and renewed clarity.

Optic Nerve
Eat your way to good eye health

Your intake of food affects every part of your body, including your eyes, but can you improve your eyesight naturally through diet? It is estimated that over 25 million people globally are affected by age-related macular degeneration and cataracts - the leading cause of blindness in people over age 55. Often these diseases are caused by inflammation and, but research tells us that lutein and zeaxanthin can reduce the risk of chronic eye diseases, whilst other studies show that vitamins C and E, beta-carotene, zinc, and omega-3 fatty acids can also help.

Research would suggest that there are six top food sources to ensure your eyes continue to function well as you age and help you avoid diseases:

1. **Spinach** Rich in both lutein and zeaxanthin, you can add spinach to sandwiches, put it in a salad or make smoothies with it. Just one cup contains a total 20.4 mg of the two nutrients, and cooking helps your body better absorb lutein.

2. **Kale** Another top source of both lutein and zeaxanthin (92.38 mg per cup), Kale contains beta-carotene and is also rich in cancer-fighting antioxidants and vitamins. Again you can put it in a salad, cook it, or blend to make a drink. It is also possible to make Kale chips.

3. **Corn** This also contains some lutein and zeaxanthin. Traditionally served on its own as a starter or side dish, research has shown that longer cooking increases the amount of lutein and antioxidant released. You can also add it to soups, casseroles and chilis.

4. **Eggs** “Going to work on an egg” provides us with a protein-rich start to the day, but it also gives us a good dose of lutein, vitamin E, and omega-3s, in addition to other nutrients and vitamins. It is even possible to source eggs that contain higher levels of lutein, vitamin E, and omega-3s.

5. **Broccoli** Give it up for our fibre-rich friend! Full of vitamin C, broccoli also contains beta-carotene, as well as lutein and zeaxanthin. A truly versatile ingredient, broccoli can be served alone but is equally comfortable in an omelette or pasta dish.

6. **Oranges** Rich in vitamin C, research has suggested that they may help improve the health of your eye tissue by helping regenerate other important antioxidants, such as vitamin E. In addition to the food listed above, sunflower seeds, garlic, and salmon are foods that help not only your eyes, they keep your hair and skin looking good, your nails strong, and your digestive system working well.
Can Good Nutrition Prevent Macular Degeneration or Cataracts?

Over the years various studies have successfully linked the Mediterranean diet (i.e. high in fruits, vegetables and fish and low in red meat and butter) with health benefits, including reduced risk of both heart disease and skin cancer. Now, for the first time, Portuguese researchers have studied the relationship between the diet and macular degeneration. The results make intriguing reading.

Researchers from the University of Coimbra studied 883 people over 55, 449 of whom had AMD. Of those who adhered closely to the Mediterranean diet, only 39% had AMD (representing a 35% lower risk than those who did not follow the diet). It was also revealed that those who consumed 150 grams of fruit per day were 15% less likely to have the condition. Giving hope to those of us who love a coffee or two, the research also showed that of the participants who drank the equivalent of one shot of espresso per day, 54.4% did not have AMD. While the study does not prove that consuming coffee and following a Mediterranean diet causes the risk of AMD to drop, Rufino Silva M.D, lead author of the study hails the study as “a stepping stone towards effective preventive medicine in AMD”.

Research suggests that certain antioxidants and good nutrition may help prevent cataracts. Flaxseed Oil and Fish Oil are good for people who have dry eyes. Also, carrots contain carotene, which your body converts to vitamin A. Lutein and Zeaxanthin are also beneficial. Omega-3 fish oils are important for keeping your eyes and your heart healthy. Vitamin A and Beta Carotene also have eye benefits. Vitamin C and Bioflavonoids are powerful eye antioxidants. Research suggests that balanced intake of Vitamins A, C, and E may reduce your risk of cataracts and macular degeneration, whilst Zinc also helps your body absorb antioxidant vitamins and may have its own protective effects.

Going bananas for eye health

It is estimated that up to half a million children in Africa and South East Asia suffer permanent blindness each year due to vitamin A deficiency. It is also estimated that half of them die within a year of losing their sight. It has long been known that carotenoids – the compounds which cause fruit to ripen – are converted into vitamin A in the liver. But until now, it has not been clear how fruits produce and store them. American scientists now report a new understanding of the process in bananas. It is claimed the ground-breaking research could result in the development of biofortified banana varieties with eye health benefits. Any such development will not come a moment too soon.
Australian scientists claim they have evidence that increased exposure to daylight is the answer to increased levels of myopia being experienced by children worldwide. They also assert that, contrary to popular belief, it is not ‘near work’ on computer screens and tablets that causes the problem – it is more the fact that computers are located indoors.

The researchers, led by Associate Professor Scott Read at Queensland University’s School of Optometry, say children should spend a minimum of one hour per day (and preferably two) in outdoor light to prevent myopia from developing. Prof. Read goes on to say that “it looks like even for those with myopia already, increasing time outside is likely to reduce progression.”

However, in a different research programme, Professor David Mackey from the University of Western Australia warns that a balance must be struck between the benefits of daylight to eyesight and the dangers of melanoma from exposure to the sun’s rays. He cites a study carried out near Perth, where people who had had skin cancer were half as likely to be myopic. Prof. Mackay urges caution: “if we tell people to spend more time outdoors, we don’t want to create a new epidemic of skin cancer”.

If current trends continue, half the world’s population will be myopic by 2050. Such is the stark warning issued by researchers in the prestigious journal Ophthalmology. Furthermore, one fifth of them (1 billion) will be at a significantly increased risk of blindness.

The research, undertaken jointly by the Brian Holden Vision institute, University of New South Wales Australia and the Singapore Eye Research Institute, cites the principle cause as “environmental factors” resulting from “a combination of decreased time outdoors and increased near work activities”.

If the findings are correct, major provision will need to be made for eye care services in the near future. The implications for children in particular are potentially huge, and the researchers advise “regular eye examination from an optometrist or ophthalmologist”. The answer may also lie in more time outdoors and reduced “near based activities including electronic devices”.

---

4. Bringing the outdoors indoors

Research shows daylight keeps short-sight at bay

---

Serious Readers
Brighter by Design
The digital world has many advantages, and our lives are increasingly dominated by virtual reality. For some this is great news, but for others there may be unforeseen health implications, not least of which is digital eyestrain. Digital eyestrain is more common than we may think. According to the American Optometric Association, in the USA eye and vision problems are reported by over 70% of all computer workers. It is likely that the figures will be similar in the UK. Headaches, eye pain, redness, watering, double vision and loss of focus are all associated with digital eyestrain. Those of us who read using an e-reader are doubly-prone to the ill effects. The good news is that there are a number of easy steps we can take to alleviate the problem. Here are 9:

1. **Take a break.**
   Every quarter of an hour, look away from your e-reader or computer and focus on an object on the other side of the room. This will give your focusing muscle a chance to relax. In addition, try "palming". This is where you close your eyes and place the centres of your palms over your eyes. While you’re doing this, take deep slow breaths and “feel” your eye muscles relaxing. This is great way to give your eyes much-needed relief during long computer projects. In addition, try to keep your shoulders and neck relaxed. “Tech-neck” will cause tension in your eyes. An occasional neck and shoulder massage also works wonders – see if you can persuade someone to help out!

2. **Keep blinking.**
   The more you focus on a computer or e-reader, the less you blink. So to counteract this, you need to think about blinking and do it consciously every 15 seconds or so. This will coat the front of the eye, which sharpens your vision and provides your eyeball with much needed oxygen and nutrients.

3. **Wear specially-made glasses.**
   For computing, you can buy specially made glasses that have a different focussing length (somewhere between 20-28 inches depending on the focal point of the eye). Computer glasses have a different focal point from reading glasses. You can also buy “occupational lenses”, which combine reading and computer lenses if you switch between your computer and a book frequently (ideal for researchers). This will reduce the effort of focusing and putting a strain on your eyes. The extra effort to focus will cause tension in the eye muscles, which in addition to causing eye discomfort can lead to an increase in eye pressure.

4. **It’s all about brightness.**
   Keep your monitor bright during working hours - this reduces flicker rate which in turn reduces fatigue. Flickering can lead to eyestrain and headaches. A bright monitor causes the pupil to constrict and a greater range of focus will result. This will reduce the need for your eye to accommodate and enable you to work longer and in more comfort.
5. Reduce blue light at night.
Research has revealed that blue light at night negatively reduces melatonin levels, which have a serious adverse health effect. It is associated with an increased incidence of diabetes, obesity and cancer. Reduce computer time at night or wear blue blocking glasses which block out the harmful blue spectrum light. In particular, be careful to avoid blue light if you are using a back-lit e-reader at night. Any kind of “red shift” feature should be enabled to ensure you nod off to sleep when you should and not suffer the additional discomfort of a sleepless night.

6. Take vitamins and minerals.
We've already covered this, but its importance cannot be over-emphasised. It is vital that your eyes get an adequate dose of vitamins and minerals. If you choose to take a supplement, opt for one that offers key antioxidants and ingredients that will help improve the health of the eye and reduce eyestrain. Those can include vitamins A, C, and E with a B complex and zinc.

7. Go Natural
Homeopathy has been reported to reduce eyestrain – you will need to consult a practitioner to find a level of therapy that will work for your individual circumstances. One of the most common homeopathic remedies employed to treat eyestrain is Ruta Graveolens. This remedy is reported to greatly reduce the symptoms of eyestrain during prolonged computer use.

8. Use a light
Not having a light on when you are using the computer (or television) can put more of a strain on your eyes. So be sure to have a light on to help reduce the strain. In addition, if you are using an e-reader, there is no substitute for a built-for-purpose reading light to reduce your eyestrain and help you see more clearly.

9. Place your computer properly.
Your computer should be at a distance of 20”-28” from your face. The exact distance depends on your personal preference. You should also ensure that there is no glare on the screen. Following some (ideally all) of the 9 steps will make you feel better and leave you able to work or read longer and in more comfort.
6. Protecting your eyes

Your eyes are extremely important. So, protecting them should be very important to you. There are a few key items everyone should take note of to help protect your eyesight. As already discussed proper diet and vitamins are key – healthy diet = healthy eyes. But beyond this, there are two additional practical steps we can all take to ensure our eyes last as long as we do.

1. Keep them covered
If you work in an environment which presents a potential threat to the health of your eyes, you need to take action. Protective eyewear should never be ignored on a building site or in a chemical plant. In the work place, you should ensure that your eyewear is of the highest quality, offering the maximum protection. If it is not, ask your employer to upgrade their provision. But even whilst doing your garden work, you need adequate eye protection. Protective gear whilst cutting the grass or tree and bush trimming is an absolute must and often ignored. Any doctor who has worked in an A&E department will tell that a huge number of eye injuries come as a result of gardening, and could easily have been avoided by the use of even a cheap pair of DIY shop goggles.

2. Get them checked
Get your eyes tested every year. If you are over 60, there really is no excuse – your eye test is free under current NHS provision. The test will make sure your eyes are looking healthy and that you have the appropriate prescription so you aren’t wearing your eyes out too soon by squinting at everything you look at. If you are lucky enough, you won’t ever need glasses, but sadly, many of us do. Take care, and remember you should never lose “sight” of what’s important, regarding your health.
Sources:

1. ScienceDaily: A better understanding of bananas could help prevent blindness.
4. ABC Australia: West Australian researchers shedding light on myopia causes.
5. Reader’s Digest: Foods that Improve Eyesight.
6. Science Daily: Fruit-rich Mediterranean diet with antioxidants may cut age-related macular degeneration risk by more than a third.
7. Guardian Express: Steps to Protect Eyesight.
8. CNN: Digital Eye Strain.
11. Lighthouse International: Myopia (Near-sightedness)