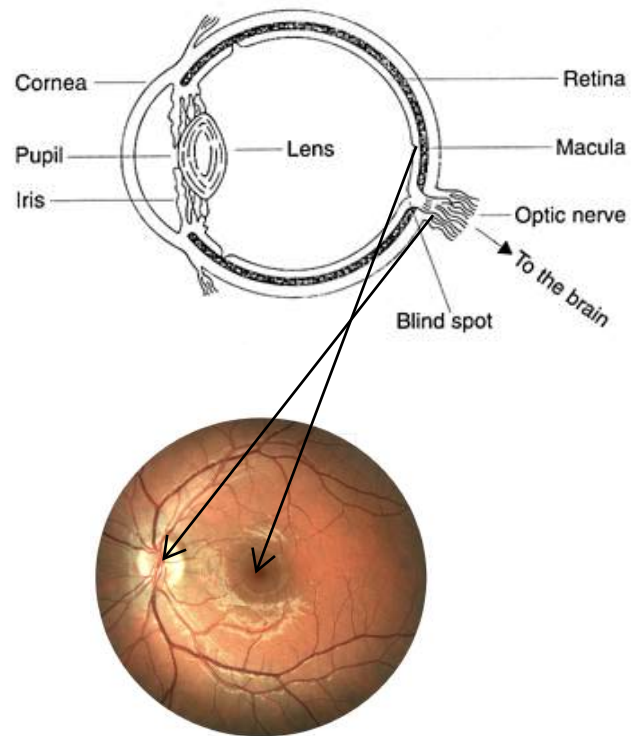


For good vision light is focussed through the eye onto the retina. The image formed is transferred via the retinal nerves to the brain. The central section of the retina is the macula. This is used for very detailed vision such as reading or watching TV. The surrounding retina is used for peripheral vision. Peripheral, or side vision, is required to allow you to move freely and see obstacles and dangers not in your direct line of sight.



Age Related Macula Degeneration (AMD)

In AMD it is only the central macula which is affected. People with this disorder are often still very mobile because their peripheral, navigational, vision is intact. They can see to the sides but the loss of central function means they can't read small print or watch TV clearly or even see the feature on someone's face while talking to them. Initially only islands of macula may be affected. At this stage normal spectacles may give satisfactory vision. As the affected retinal areas enlarge the blind spots (scotomas) created, become larger and affect central vision more profoundly; as in the photograph. At this stage a change in glasses will not necessarily help since they simply focus light at the macula, which is faulty.



Magnification (BIG) for Reading

The magnification can be achieved with very high powered reading adds, possibly +10 or +15 (no more than +2.5 is usually given). These leave the hands free to hold the work, but do reduce the working distance considerably, and the patient will have to hold the work very close.

Hand magnifiers allow a longer working distance and, if illuminated, optimize lighting (BRIGHT), so crucial in maximising visual capacity.



However, the patient will need to use one hand to hold the magnifier which can be difficult if the patient is frail.

CCTV can give a very high magnification but the technique of not looking at the book but watching the screen has to be learned.



With the increasing use of computers and other options the number of aids is increasing. IPads and Tablets can be used to increase the image size. Downloading books allows you to manipulate all three 'B's BIG (Blow it up), BRIGHT (the screen is illuminated) and BOLD (the download is pure data meaning it is pure black on white with sharp edges). For spot tasks these tools can help as well. Because they incorporate a camera, very difficult coloured labels can be photographed and then blown up to be able to see.



Visual Aids

This is not the end of the line, however. With adaptability on the part of the patient and effort from the optometrist, much can be achieved to optimize the patient's use of the vision which remains. A complete change in strategy is required. Low visual aids (LVAs) such as very high powered adds, magnifiers, telescopes, closed circuit television (CCTV) and now computer based aids, including kindles and IPads, can enhance usable vision for specific tasks. The principle is to magnify the images to transcend the blind spots.

Figure 1 shows an un-magnified image falling entirely within a small scotoma. This will not be seen. When the letter is magnified the scotoma remains unchanged, but the image will now be recognisable since its' image now falls on a wider area with intact retina (Fig 2).

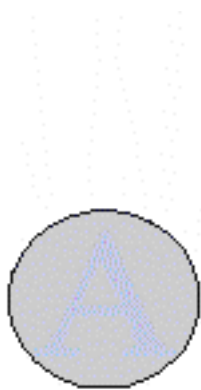


Fig 1

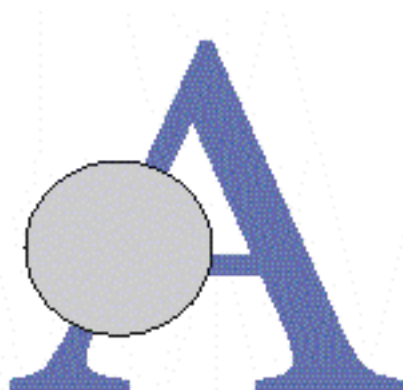


Fig 2

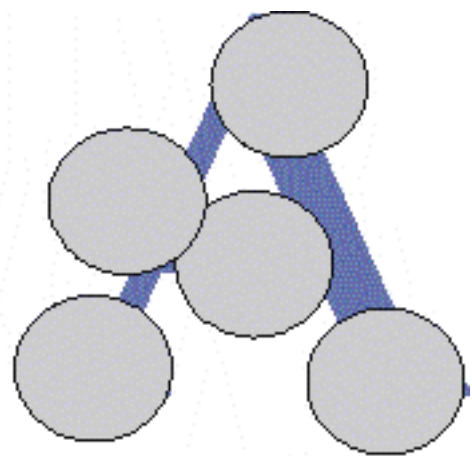


Fig 3

If the condition progresses the blind spots may enlarge and coalesce making even the magnified image difficult to recognise (Fig 3).

We also need to maximise the environmental side of vision which is:

BIG, BRIGHT, BOLD

Large enough print (BIG), optimised light (BRIGHT) and contrast (BOLD)

Magnification (BIG) for Distance

Telescopes can be spectacle mounted and can help both distance and near vision, but have a very small field of view.

For TV it is often best to sit close or get a large TV.



If you imagine a TV a long way away. The angular size of the TV at your eye is quite small. This sized image could fall into the blind patch (left).

If the TV is brought in very close the angular size of the TV at your eye is much larger but the blind patch will be the same. Hence the TV can be seen more easily.

