

# A course in low vision practice

## PART 8 – Using vision and other senses effectively

**Barbara Ryan and Tom Margrain** discuss various strategies which may help people with a visual impairment in their everyday lives (Module C3891, one standard point)

WHEN OPTOMETRISTS and dispensing opticians think of low vision an image of a magnifier usually comes to mind. In providing a low vision service there are many other devices and strategies that the practitioner can provide, or signpost the person with a visual impairment toward, to help them use their vision and other senses effectively.

### POSTURAL AIDS

Most magnifiers are used at a fixed distance from the object and many need to rest on the material the person wants to view. This can make the posture very unnatural and uncomfortable to maintain for long.

### Clipboards

Clipboards are helpful for anyone using a magnifier. If the material a person wants to read is flimsy, such as a newspaper, magazine or letter, using a magnifier is very difficult. Putting the reading material on a table would mean stooping over it and is not portable. A clipboard can provide a firm surface, allows good posture and portability.

Clip-boards with top clips are best to avoid interrupting reading with stand magnifiers (Figure 1). The clip needs to be firm but able to be operated by arthritic or otherwise weakened hands.

### Reading stands

If a person wants to do prolonged reading, having material at a desk or on a table may be the only option because holding a magnifier and the material for a long time is not easy. A reading stand may provide an adjustable firm support for the task, allowing a more natural posture. Reading stands can be home-made or bought commercially.

When choosing one you need to ensure it is strong enough, adjustable and able to hold the material. Eschenbach and the RNIB sell reading stands designed for low vision use.



FIGURE 1. Boards with top clips are best

### Double clamps

A hand magnifier can be converted into a variable focus stand magnifier by using a double clamp – one end attached to a table, the other holding a magnifier. This can be useful for doing tasks that require both hands free such as writing or sewing. To hold the magnifier the clips need to be strong and may be difficult to operate for someone with dexterity problems.

### TRAINING TECHNIQUES

#### Eccentric viewing

When a person has a central scotoma they will need to use eccentric viewing (EV) and fixate at the side of the object they want to view. The size of the central scotoma will dictate how useful this EV is. Some patients find their preferred retinal location (PRL) naturally but others need help. Many people will have more than one PRL because an area that is used to look at faces may not be large enough to provide a good retinal image when, for example, print is magnified.

Patients may first become aware of EV because they notice they turn their head to look at things. Teaching them to turn their eyes rather than their head for non-reading tasks, such as watching the TV,

General Optical Council

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Association of Optometrists Ireland

### A COURSE IN LOW VISION PRACTICE

In this series of 12 articles, Barbara Ryan and Tom Margrain from the School of Optometry and Vision Sciences, Cardiff University outline some of the basic theory required for low vision practice. These articles are based on modules which were developed to train the optometrists and dispensing opticians who provide The Welsh Low Vision Service which has been developed and is funded by the Welsh Assembly Government

can be more comfortable.

To demonstrate this the person is directed to look at your face directly then move their fixation to the numbers of a virtual clock around it starting above at 12 o'clock and moving clockwise 1, 2, 3 and so on. They will find that some positions allow them to see your face better. A process of elimination will allow them to find one position in which they can see best – a PRL. They can try this at home with the television.

Using EV to read is much more difficult. Lengthy training to improve reading speed with central visual loss has been advocated.<sup>1</sup> This approach is not universally accepted and few optometrists or dispensing opticians in the UK provide EV training. If EV training is provided it is usually by other professionals, such as rehabilitation workers, who have undertaken training in 'low vision therapy'. Poor results were obtained when insufficient time was devoted to training<sup>2</sup> and so it is probably best for optometrists and dispensing opticians not to undertake this work.

### Steady eye strategy

Using a magnifier, keeping a preferred retinal location and moving your eyes from word to word along a line of print is very difficult and for most impossible. To get around this problem it has been suggested that patients with a macular scotoma read best if adopting eccentric fixation and moving the text from right to left while holding their eyes still. The person fixates the first letter on the line of print, and is instructed to obtain the clearest possible view of it. As they keep their eyes still and move the print, the 'steady eye strategy' (SES) allows the letters to be imaged in turn on the preferred retinal location.<sup>3</sup>

It is proposed that SES can allow people to achieve much higher reading speeds. It does, however, require daily practice and special texts to help have been developed.<sup>4</sup>

Undertaking to provide this training in the use of EV and SES is outside the remit of most clinical low vision practitioners. However, the principles of SES can be used by anyone using a magnifier. Due to the reduced field of view and problems co-ordinating eyes, head, hands and magnifiers many people will benefit by the simple instruction to hold the magnifier and eyes still and move the text. Other professionals, such as rehabilitation workers, may be able to offer longer instruction.

### Finding the next line

Whether using SES, or moving the magnifier and eyes along the text, finding the next line in a body of text is often difficult. When people do not have low vision they move their fixation diagonally left and down, from the end of one line to the beginning of the next. When the person has a scotoma and is looking at magnified text through a small field of view this becomes much more difficult and so they are apt to miss the beginning of lines and lose their way. For almost everyone with low vision it is best to instruct them go back to the beginning of the line and then drop down to the first word on the next line. This can be aided by the use of a card under the text, a typoscope or a finger placed at the beginning of each line (Figure 2).

### AIDS FOR PERIPHERAL FIELD LOSS

Discussion with experienced low vision practitioners reveals isolated cases in which they have found aids for peripheral visual field loss to be of benefit. It may be worth trying some such aids for highly motivated patients with stable visual field loss. However, the majority find them disorientating and difficult to use. For this reason, only a brief summary of the options available is given in this text.



FIGURE 2. A typoscope

Those wishing to undertake prescribing such devices should refer to the extensive text in Christine Dickinson's book.<sup>5</sup>

### FIELD EXPANDERS

Field expanders work on the principle that if a scene is minified more information is available within the limited remaining visual field. The patient can experience this by turning a Galilean telescope the wrong way round. The problem with this system is that the field of view is small. A door peep-hole viewer gives a larger field of view and can give a monocular field of view of 90° to 140°. With all field expanders, a person's visual acuity is reduced and perception of depth and movement distorted. For this reason, if field expanders are used it tends to be solely for the static location of objects.

### Mirror reflecting systems

Reflecting systems are used very occasionally for patients with a hemianopia. Mirrors fitted monocularly on the side of the spectacle furthest from the visual field defect (with reflecting surface towards the defect) reflect objects from the non-seeing field to appear superimposed on the seeing field. The movement in the reflected field is the reverse of the real field so the two scenes are distinguished.

### Partial – aperture prism refracting system

Prisms (20-25Δ) attached in one or more positions to a spectacle lens refract objects from the non-seeing field to nearer the midline. These can be used for people with a hemianopia or altitudinal visual field loss. They are fitted either monocularly or binocularly on the side of the spectacle lens nearest the visual field defect with the prism base towards the defect.

### MOBILITY AIDS

A mobility aid assists a person to navigate safely and comfortably from one position

to another in an environment. A sighted person guiding a person with a visual impairment (sighted guide technique) is one method of achieving this.

### GUIDE DOGS

Only a very small number of people with a visual impairment use guide dogs. To have a guide dog you have to be over 16, fit and active enough to walk and care for the dog. Applicants must attend extensive training with the dog. The owner must be able to direct the dog as to a given route, the dog assisting with crossing roads, avoiding obstructions and so on.

### WHITE STICKS AND CANES

There are four types of stick. People using red and white striped canes are deaf and blind.

A symbol cane is made from sections of folding lightweight tube is designed to indicate the user has a visual impairment,, for example in a busy shopping street it alerts people to keep out of the user's way. These are available from social services and the person needs some instruction in their use.

A white walking stick is used by people who need support for walking and generally acts as a symbol rather than navigation aid. Occupational therapists or physiotherapists usually prescribe these.

The long cane, lightweight with a crook handle, is swung from left to right in front of the user. Some have a roller ball on the end to allow it to move along the ground.

The guide cane is shorter and sturdier than the long cane. It is used by people with some vision to navigate hazards such as kerbs and stairs. Rehabilitation workers give training in the use of these canes.

### ELECTRONIC MOBILITY AIDS

A variety of electronic mobility aids have been developed. Some assist navigation, for example laser guide canes; and others help with orientation, for example talking GPS navigation systems. Currently, none are widely used.

### MAKING THINGS BIGGER

As detailed in the module about magnification, relative size magnification (or making things larger) is another way of making things easier to see. This can be used on its own or in conjunction with other forms of magnification.

### LARGE PRINT

Large print can allow a more natural reading position, is easy to use, needs no training and has less stigma attached than the use of magnifiers. Unfortunately, due to physical constraints it is usually only

available up to X2. The increased size and weight of reading material can also be a problem. Large print can be used with magnifiers, allowing a lower power to be prescribed hence larger field of view and less distortion.

The size of commercially produced large print varies from 14 to 24 point. Unfortunately, publishers do not always also use legible fonts or improved contrast.

All libraries have a selection of large print books but the number and selection varies. There are four publishers of large print books which concentrate mainly on fiction: Ulverscroft Large Print Books, Chivers Press Publications, Magna Large Print Books and Isis Large Print. They will supply catalogues direct to the public but they can be expensive.

The RNIB's library service in Peterborough (08457 02 31 53) will try to help source a book for a person. The National Library for the Blind has a small selection of books available on loan which are mainly curriculum texts although it offers electronic versions of a lot more through its website.

Many religious publishers publish large print Bibles and hymn books.

Collins and The Oxford Press produce a large print thesaurus and dictionaries in several languages. A weekly newspaper entitled *Big Print* is available for a subscription in the UK.

Some local voluntary organisations and the RNIB produce large print diaries, address books and calendars and The Partially Sighted Society produces large print cook books and crossword books.

All utility companies, banks and credit card companies are required by law (the Disability Discrimination Act) to produce large print statements and bills. Some music and knitting patterns are available in large print. Information about these can be obtained from the RNIB's leisure department. If you are providing a low vision service you should, when possible, provide appointment details and information to low vision patients in large print.

Patients, their friends and families should be encouraged to produce large print. Copies of recipes, music and other shorter pieces of text can be made larger using the enlargement facility on photocopiers, although care should be taken because contrast may reduce. Black felt-tip pens can be used to write large print phone numbers, lists, labels or letters. Computer settings can be adapted to aid their use and printing good quality large print texts is easy.

### OTHER LARGE OBJECTS

Many other 'bigger' items are available from social services, local voluntary organisations and the RNIB:

- ◆ Watches and clocks with large dials and



FIGURE 3. Very few people use a guide dog

hands or displays

- ◆ Telephones with bigger numbers
- ◆ Large dial timers and microwaves
- ◆ Several board games are available which have bigger boards, markings and counters
- ◆ Large dice and playing cards, bingo cards and counters
- ◆ Rulers and tape measures
- ◆ Row counters for knitting
- ◆ Large dial blood glucose monitors.

### SIGHT SUBSTITUTION

Over 80 per cent of information from the world around us comes from the sense of sight. Even when this is reduced, as in a person with low vision, sight is often still the prominent sense so use of residual vision is often preferred. Other senses, mainly hearing and touch, may be used for some tasks but often sight substitution methods and sight enhancement may be used in conjunction with one another. For example, a person may choose to read the newspaper or magazine using a magnifier but find talking books easier for longer novels.

It is untrue that people with a visual impairment have an enhanced sense of hearing and touch but they often learn to use them more effectively.

Many items are available which use sound and texture to assist people with a visual impairment with daily living tasks:

- ◆ Different shaped buttons can be sewn into clothes to allow colour matching
- ◆ A liquid level indicator beeps when the liquid reaches it so that cups or jugs are not over-filled
- ◆ A rain gauge which alarms when the rain starts is useful if the washing is on the line
- ◆ Audio-described videos are now available in many popular titles, the story

being narrated over the original film

- ◆ Talking microwaves, clocks, watches, thermometers and scales
- ◆ Vibrating clocks are available for people who have difficulty seeing and hearing
- ◆ Games with tactile counters, boards and cards
- ◆ Balls that produce sound for ball games such as football and cricket
- ◆ Bump-ons can be used mark up dials on appliances so positions can be seen and felt.

### BRAILLE AND MOON

Braille is probably the best-known method of sensory substitution. Particular combinations of up to six raised dots, arranged as with the number on a dice, produce each of the 63 symbols. Relatively few people read and write Braille: less than 10 per cent of blind people in the UK can write it. Quite a few people use it for labelling and short texts rather than reading books. Most people who use it learn Braille at school and are congenitally blind although most rehabilitation workers can teach it to adults. Braille is written using a simple Braille writing frame, a typewriter-type machine called a Perkins Braille or by computer Braille printers. The National Library for the Blind is a major source of books for loan and the RNIB publishes a number of Braille magazines and journals.

Moon is simpler to learn than Braille since its shape resembles letters but very few people use it and there are not many books available.

### TALKING BOOKS

Many people with a visual impairment choose to read books that are recorded on auditory CDs. The RNIB's talking book service holds over 10,000 titles which can be played on easy to use machines. An annual subscription, often paid by the local authority, allows as many titles as the person wants to be loaned each year.

The Talking Newspaper Association of the UK is a national charity co-ordinating efforts of voluntary groups around the country who produce versions of their local newspaper on tape. The central organisation produces taped versions of national newspapers and magazines, of which there are currently about 200 titles. For a fixed annual fee a person can receive as many of these as they wish.

### COMPUTERS

Computer technology adaptations for people with a visual impairment have progressed rapidly in recent years. Both sight enhancement and sensory substitution techniques can be employed so that anyone with a visual impairment, regardless of their level of vision, can use them.

Navigation around a computer can be aided by magnifying or speech output software and the contrast and colours can be changed easily. The information in a document can be enlarged, read to you or processed onto a Braille pad. Input can be via a keypad with large characters, Braille characters or speech. The equipment exists to allow the image from a CCTV to be displayed on a split screen with the computer document and anything can be printed in Braille or large print. Many websites are accessible and many books are available on the internet for conversion into a preferred format.

**References**

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**MULTIPLE-CHOICE QUESTIONS**

- 1 Which of the following is true about eccentric viewing?**  
 A All patients with a central scotoma adopt eccentric viewing  
 B A patient may have more than one preferred retinal location  
 C Success with eccentric viewing increases with size of scotoma  
 D Eccentric viewing requires head turning
- 2 Which of the following is not usually classified as a postural aid?**  
 A Clipboard  
 B Large print book  
 C Reading stand  
 D Double clamp
- 3 Which of the following best describes steady eye strategy?**  
 A Moving the text from right to left while maintaining steady gaze  
 B Moving the text from left to right while maintaining steady gaze  
 C Moving the eyes to the best position of text focus and interpreting less clear surrounding text by inference  
 D Finding the PRL and then moving the book to the new position before scanning the text with the eyes using that point
- 4 Which of the following helps relocate the start of the next line when using SES?**  
 A Double clamp  
 B Reading stand  
 C Typoscope  
 D Field expander
- 5 What is the significance of red stripes on a white cane?**  
 A Severe sight impairment  
 B Support is the main concern  
 C Navigation is the main concern  
 D Hearing as well as sight impairment
- 6 How many different symbols are needed in order to understand Braille?**  
 A 26  
 B 63  
 C 100  
 D Infinite number as it is a symbolic language

The deadline for responses is May 18

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