CET

COMPETENCIES COVERED

Dispensing opticians: Standards of Practice , Optical Appliances, Low Vision , Refractive Management, Ocular Abnormalities

Optometrists: Standards of Practice, Assessment of Visual Function, Ocular Disease

Low vision: categories and strategies

By Richard Harsant FBDO(Hons)CL (Hons)LVA Hon MIADO

For a relatively inexperienced practitioner, low vision (LV) assessment may be a daunting prospect, which is approached with a degree of anxiety. It is highly likely that a patient will be even more anxious than the optician, so it is vital that the process of assessment proceeds according to a logical plan. This article sets out to provide the practitioner with a framework for accomplishing the best result.

Fewer than four per cent of those people Certified as Visually Impaired or Severely Visually Impaired have no perception of light. It is our goal, during an LV assessment, to provide appliances and teach techniques that will enable Visually Impaired People (VIPs) to make the best possible use of their residual vision, thereby enabling them to lead independent lives.

Pathologies may be grouped according to the effect that they have on a patient's vision. Readers are advised to refresh their knowledge of the signs and symptoms of each condition. LV management and rehabilitation can be managed according to the following classifications.

CATEGORIES

GROUP 1

Pathologies that may cause defects in the central visual field. Examples may include:

- Age related macular degeneration (both 'wet' and 'dry')
- Central serous retinopathy
- Macular holes and epiretinal membranes
- Macular oedema
- Diabetic maculopathy
- Toxic maculopathies
- Hereditary maculopathies (e.g. Best's disease and Stargardt's disease)
- Optic nerve disease (e.g. dominant optic atrophy and Leber's optic neuropathy)
- Nutritional and toxic atrophies

GROUP 2

Pathologies that may cause defects in the peripheral visual field. Examples may include:

- Glaucoma
- Optic neuritis
- Ischaemic optic neuropathy
- Hypertensive optic neuropathy
- Proliferative diabetic retinopathy
- Drusen and optic disc anomalies
- Retinal dystrophies
- Retinitis pigmentosa
- Retinal artery occlusion
- Retinal vein occlusion

GROUP 3

Pathologies that may cause opacities and haze in the ocular media.Examples may include:

- Corneal dystrophies, degenerations, infections
- Metabolic disease
- Cataract
- Vitreous opacities & haemorrhages
- Uveitis

GROUP 4

Miscellaneous conditions. Examples may include:

- Keratoconus
- Aniridia and iris coloboma

STRATEGIES

The 'weapons' in the arsenal of the low vision practitioner are:

- To ensure that the patient is wearing their optimal ametropic correction
- To optimise the level of illumination for the tasks the patient is to perform
- To minimise glare and to increase contrast for the tasks
- To give appropriate vision training
- To optimise the size of the retinal image
- To optimise the field of view

IS THE PATIENT WEARING THEIR BEST AMETROPIC CORRECTION?

It is not unknown for a patient to stop wearing their spectacles when they have been certificated as Sight Impaired or Severely Sight Impaired. The 'logic' behind

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this decision seems to be that they have been given the impression that nothing can be done to help them – so why bother wearing spectacles?

When supplying LVAs, it is essential to have light focused as sharply as possible on the retina to get maximum benefit from the LVA. Some patients will forgo their normal routine eye examinations once they attend a low vision clinic. They should be encouraged to have routine checks just like everyone else. Just because they have (for instance) age-related macular degeneration (AMD) it does not mean that they can't acquire, for example, cataracts as well – and therefore possibly benefit from surgery.

WHAT IS THE OPTIMUM LEVEL OF ILLUMINATION FOR THE REQUIRED TASK(S)?

If insufficient illumination is provided for the required task, the patient may suffer from asthenopia and become unnecessarily tired from performing the task because of the stress of concentration. If too much illumination is provided, the patient may tire because of glare.

The practitioner should guide the patient to experiment with some task lighting and record the best result. For example, "Desk lamp – 2 X 9W fluorescent tubes @ 25cm." The optical correction (and/or LVA) being used should also be recorded.

The Inverse Square Law should be remembered; if the distance is halved from the light source to the task, the illumination will be increased by four times.

Some patients may see television better with low ambient lighting, others may feel better if the room is more brightly lit. Adjustment of the colour contrast control may also prove helpful, with some people preferring an almost black and white picture, and others feel better with the colours much bolder.

MINIMISING GLARE AND INCREASING CONTRAST

There are two types of glare:

- Discomfort glare: this makes the patient feel uncomfortable, but does not necessarily affect visual performance; and
- Disability glare: this reduces visual performance as well as affecting visual performance.

A balance must be struck between providing enough illumination for our patient to see, and providing too much, which may have the adverse effect of producing glare. It is also vital that the illumination is directed at the task the patient is to perform, and not into the patient's eyes.

Indoor sources of glare may include general room lighting, task lighting, television sets, windows, etc. The most obvious outdoor sources of glare of the sun during the day, and street lighting at night. Protecting a patient from too much light may be achieved in several ways. Tactics can be used such as using a less powerful bulb or tube if asthenopia is related to task lighting, or using a more effective lampshade, or less powerful bulb if it is related to general room light. The eyes may need to be kept in the shade by using an eyeshade, or perhaps close the curtains over a window.

Patients from all aforementioned groups may benefit from consideration of illumination, glare, and contrast, but those that are likely to benefit most are those with Group 3 conditions, who experience haze and opacities in the ocular media.

PATHOLOGY	1ST CHOICE	2ND CHOICE	3RD CHOICE
ARMD	yellow	amber	orange
Optic atrophy	yellow	amber	orange
Albinism	yellow	orange	red
Cararact	amber	orange	yellow
Glaucoma	amber	yellow	orange
Retinitis pigmentosa	red	amber	
Diabetic retinopathy	orange	yellow	

Table 1. Low vision filter choices

COLOURED FILTERS

Patients' reactions to wearing coloured filters are very variable, especially to unusual coloured contrast lenses. Although a particular coloured filter may enhance their vision their overpowering concern may be the desire to appear 'normal'. **Table 1** is for guidance only. It indicates the colour of filter likely to assist a patient with the indicated pathology. Demonstration lenses might be available in lorgnette form, but in practice hand held clip-ons may be used quite successfully.

A technique for prescribing filters involves having four standard filters from the same manufacturer in yellow, amber, orange and red (**Figure 1**). Each of the clip-ons is offered to the patient and asking the question: "Do you see more clearly with the lenses or without?" If a positive response is obtained for more than one filter, the choice may be made by trialling again on a: "Do you see better with the first set of lenses, or the second set?"

The trial should not be made with the patient looking at a high contrast test chart. Some practitioners like to use a low contrast chart. But probably the best option is to use items in the room, the patient's

Figure 1: A selection of clip-on tints for patient self-selection

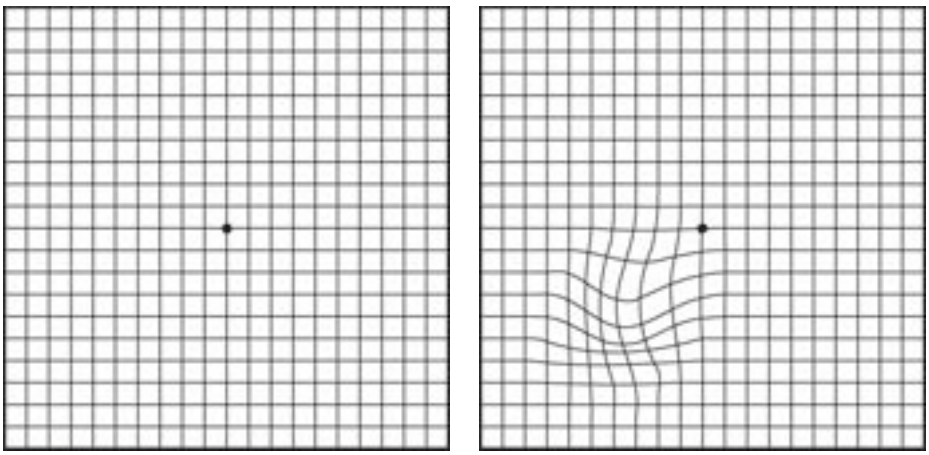


Figure 2: The Amsler chart, showing the distortion caused by wet AMD in Figure 2b

friend, or maybe a view from a window to assess the efficacy of various filters, indicates whether the filter is helping the patient in their everyday life.

VISION TRAINING

There are ways in which a visually impaired person can use techniques that can help them to make best use of their residual vision. Emphasis should always be placed on the useful vision that remains, not on that which has been lost.

ECCENTRIC VIEWING

This technique is appropriate for patients who have suffered loss of the central visual field. The most common cause of visual loss in the developed world is AMD. Eccentric viewing is, therefore, appropriate for a majority of the visually impaired patients encountered.

It is rare for macular function to be totally lost, and patients sometimes discover for themselves that by looking slightly away from the object they want to see, they can see it better than if they look straight at it. What is happening is that the retinal image is falling on an area of the macula that is functioning better than the surrounding area.

If this area can be located in the retina (the Preferred Retinal Location or PRL) then the patient can be trained to use that area, rather than the ones that are functioning less well. We can usually achieve this by using an Amsler Chart (**Figure 2**). The eye that sees least well is occluded and the Amsler chart is viewed at a distance of 28-30cm with the better eye.

If the patient is presbyopic, an appropriate reading addition should be used. It may be helpful to draw diagonal lines on the standard Amsler Chart to assist the patient to concentrate on the centre of the chart. The patient is asked to indicate where the grid is least distorted. This is the PRL.

If, for instance, the PRL is up and to the right of the word the patient wants to read, they need to look down and to the left of that word, because the image is then being formed on the least affected part of the macula.

Eccentric viewing can also be used to help the patient with seeing distant objects when they are moving around simply by looking away from the object they want to see in the direction of the PRL.

A variation of this technique may be employed to help patients with hemianopia to read. The reading matter is rotated through 90 degrees and the patient reads from top to bottom rather than left to right.

SCANNING

Patients with Group 2 eye conditions may have reasonably good central vision, and can often perform quite intricate tasks reasonably well, but they experience difficulty with mobility. Learning to use a scanning technique can be very useful.

Let us say that our patient has just entered a room. They can form a mental picture of the furniture and any other potential hazards in the room if they stand still for a few moments and scan the room in a shallow zig-zag pattern, starting at a little above head height and down to floor level, noting the position of furniture and any other potential hazards. With practice, many such patients become able to use the scanning technique continuously as they move around.

Patients with advanced retinitis pigmentosa may have particular problems seeing in twilight conditions, and may benefit from electronic night vision devices.

OPTIMISING THE SIZE OF THE RETINAL IMAGE

Patients with Group 1 eye conditions are likely to benefit from magnification. It is important that magnification is prescribed according to the tasks that are to be performed and how long the tasks are to be undertaken. Slightly higher magnification may be prescribed if tasks are to be prolonged, however providing more magnification usually results in a reduction in the field of view.

OPTIMISING THE FIELD OF VIEW

Often a compromise has to be struck between magnification, field of view and illumination. In these cases, the various options should be demonstrated, and the patient fully involved in arriving at the outcome.

Patients with Group 2 conditions may have quite good visual acuities, but restricted visual fields (see above). Some patients do find field expanders useful. A hand-held 3X or 4X monocular telescope may be used the 'wrong' way around. A patient who has good central VA but severely restricted fields might use this, for instance, when entering an unfamiliar room to spot the positions of chairs, tables etc, while standing still.

While enhancing the patient's field of view, the device would reduce his VA. Moving around while using a field expander is disorientating and possibly dangerous so they are rarely successful.

GROUP 3 CONDITIONS

Pathologies in this group are normally helped with filters and by keeping the eyes in the shade. They often cause glare from light being reflected from intraocular debris, etc. Some cases respond well to contact lens fitting, filters and multiple-pinhole spectacles (available quite cheaply from various internet sources).

GROUP 4 CONDITIONS

Keratoconus cases usually respond well to contact lens fitting. In very early stages, special soft lenses may help, but in most cases rigid lenses will give a much better optical result. Often patients with keratoconus will also exhibit atopy, which may make contact lens wear challenging. The author has had success in fitting piggyback systems in many of these cases.

Again filters and multiple pinhole spectacles and stenopaic slits may have their place in the care regime for this category especially if contact lens tolerance is poor.

Figure 3: Typoscopes come in various sizes to suit the task


Figure 4: Audible liquid level indicator

NON-OPTICAL AIDS

In addition to the strategies discussed above, many low vision patients can be helped by non-optical aids. For example, Category 3 patients can find glare from white paper troubling, and so will appreciate the reading/writing guidance afforded by a typoscope (**Figure 3**).

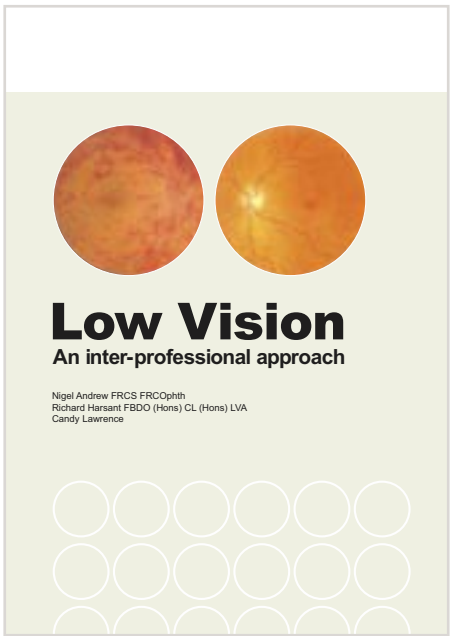
The low vision patient should also be encouraged to make good use of their other senses, such as hearing and touch. **Figure 4** shows a device, which beeps to signify when a cup is filled, and the telephone shown in **Figure 5** has tactile, large buttons. There are also speaking clocks, watches and scales. The RNIB online shop is an excellent resource for all low vision patients to explore ways they can be helped in everyday life.

By categorising various pathologies in the manner described in this article, a practitioner may prescribe appropriate low vision aids, significantly assisting in a patient's rehabilitation.

RICHARD HARSANT has run low vision and clinical contact lens clinics for East Kent Hospitals University NHS Trust for more than 20 years. He has lectured in these subjects in the UK, Eire, Malaysia, and Kenya, and the Republic of South Africa as well as authoring several CET articles. The designer of the Harsant Charts used in many LV clinics, he recently retired as principal examiner (low vison) for ABDO, but continues in part-time practice.

He is co-author, with N. Andrew and C. Lawrence, of *Low Vision – An inter-professional approach*, a low vision handbook for practitioners and students of all disciplines involved in assisting people with visual impairment (available from the ABDO College bookshop).


Figure 5: Larger versions of everyday objects



Available to order through the ABDO College Bookshop