

A course in low vision practice

PART 4 – Prescribing solutions

Having looked at assessment requirements, **Barbara Ryan** and **Tom Margrain** explain the approach to sensible prescribing and follow-up (CET Module C2263)

PRESCRIBING SPECTACLES FOR LOW VISION PATIENTS

As already mentioned, some people with a visual impairment are more likely to have high and changing refractive errors. However, practitioners need to be more cautious than usual when prescribing spectacles as part of a low vision assessment. A recent audit of a hospital low vision service in Northern Ireland found that only about 8 per cent of patients were prescribed spectacles at the low vision assessment.¹ While, as with all your patients, you want to ensure the person has the best possible correction of their ametropia, this needs to be weighed up with other factors:

- ◆ Many conditions that cause low vision are progressive and unpredictably so. Spectacles prescribed may be no use to the person in just a month or two
- ◆ In the early stages, many people with low vision hold onto the hope that a new pair of spectacles will solve all their visual problems. No matter how much you explain that this will not be the case, due to denial, that expectation is often still there. Therefore, prescribing spectacles may prove counter-productive to the rehabilitation process
- ◆ The major concern expressed by people with low vision when asked about going to optometry practices for low vision services was that they would be sold spectacles

they didn't need.² If you prescribe spectacles that turn out to give little noticeable improvement, you may compound this fear and lose a person's confidence in you as a low vision practitioner.

Therefore, you need to be convinced that a change in prescription will make a significant difference to the person. An improvement of at least two complete lines of VA should therefore be achieved with the new prescription (unless asthenopic symptoms or visual requirements dictate otherwise). For people with poorer levels of acuity, a greater improvement may be required. Always check that it will make a difference in real life by showing the person the change while looking at a face across a room or a shop sign. If in doubt don't prescribe at the first appointment but re-assess the prescription at follow-up.

Of course it is not only a change in refractive error that may warrant a change of spectacles for a patient with low vision:

- ◆ **Material of lenses.** People with a visual impairment are more prone to falling.^{3,4} If a person is wearing glass lenses and is complaining of mobility problems, a change to plastic for safety reasons may be considered
- ◆ **Lens design.** Multifocal lens designs do not always work well for people with some low vision aids. They may also compound other problems eg older multi-focal lens

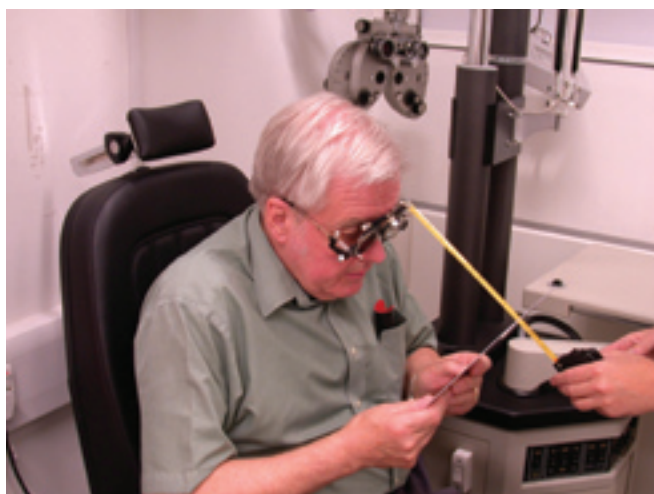


FIGURE 1. Assessing reading ability at 25cm with a +4.00D addition is a useful starting point



Successful participation in each module of this approved series counts as one credit towards the GOC CET scheme administered by Vantage and one towards the AOI's scheme.



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

wearers have been found to be twice as likely to fall as single-vision lens wearers.⁵ Single-vision lenses may therefore be required

- ◆ **Tint.** Whether a tint is to be incorporated into a prescription must be considered
- ◆ **The choice of low vision aids.** A prescription may need to be adapted to be used with a specific low vision aid. This is discussed in a future article
- ◆ **High reading additions** providing magnification may be prescribed in the absence of refractive error change.

PRESCRIBING LOW VISION AIDS

Once you know what the person wants to see, have assessed some measures of their visual function and prescribed the best spectacle prescription you can start to try to help them achieve their goals. The first step is usually to find out what can be achieved with low vision aids (LVAs).

Getting started with magnification

When determining the low vision aid a person needs, to do a given task you start

by working out the approximate magnification required. There are two main ways to do this.

1 Increasing the reading addition

One way to determine the starting magnification for near is (when the person is corrected for distance) to increase the reading addition (and decrease the working distance) until the person reads the desired task at the fluency required. Start with a +4.00DS addition in the trial frame, holding the print at 25cm from the spectacle plane, and record what the person can read (Figure 1). The near addition is then increased until the desired near acuity is achieved.

Eq +4.00DS N12 @ 25cm
 +8.00DS N6 @ 12cm
 +10.00DS N5 @ 10cm

The magnification required is then calculated:

$$M = \frac{F}{4} = \frac{+10.00}{4} = X2.5$$

So you would start by trying an aid with X2.5 magnification to read N5 print.

This method is not used exclusively because it is labour intensive, patients often don't like to hold things so close, trial cases sometimes don't have lens powers high enough and, for higher levels of magnification, the working distances can be extremely short. Nevertheless, this method still holds a useful place in low vision practice. It is especially useful for people whose visual acuity is still reasonably good and for those who 'just want stronger glasses' because you can demonstrate the effect of increasing the near addition.

2 Calculating the predicted magnification

Another way to determine the starting magnification is to calculate it by comparing what the person can read to what they want to read when wearing the best Rx:

$$\text{Magnification} = \frac{\text{What the person can see}}{\text{What the person wants to see}}$$

This can be used for distance or near magnification. For example: a patient whose distance VA is 6/60 wants to see a street sign requiring 6/12 VA.

$$\text{Magnification} = \frac{60}{12} = X5$$

So you would start by trying X5 telescopes. For example: a patient can read N24 at 25 cm with a +4.00 D addition and wants to read instructions with print size equivalent to N8.

TABLE 1 Visual requirements to achieve different reading speeds ⁶		
Visual requirement	Fluent reading (160 wpm)	Spot or survival reading (40 wpm)
Acuity reserve	3:1	1:1
Contrast reserve	10:1	3:1
Scotoma diameter	4°	30°
Field of view	4- 6 letters	1 letter

$$\text{Magnification} = \frac{24}{8} = X3 (+12.00D)$$

So you would start by trying a X3 (+12.00) near low vision aid.

In practice the predicted and actual reading acuity don't always correlate. External factors such as lighting, posture and font affect a person's ability to read. Visual parameters such as the size of the scotoma, field of view, contrast reserve and acuity reserve are known to affect what and how a person will be able to read (Table 1).⁶ It is not always practical to take all of these factors into account and many cannot be manipulated clinically. However, it is useful to consider acuity reserve when calculating a starting point for the required magnification:

- ◆ If a person wants to read text for a short time, such as instructions on a packet ('spot' or 'survival' reading), then the magnification is calculated as shown above because the near acuity needed is equal to the near acuity threshold (measured using a with a Bailey-Lovie near chart) ie the acuity reserve ratio is 1:1
- ◆ If a person wants to read a longer text that requires more sustained, fluent reading, such as a novel, you need to divide the size of the text by three to get a more realistic target acuity ie the acuity reserve ratio is 3:1.

For example: a person who has an acuity threshold of N12 wants to read their post (minimum N6) and the newspaper (minimum N8). Reading the post is mainly a short, survival, reading task:

$$\text{Magnification} = \frac{12}{6} = X2 (+8.00D)$$

For the newspaper fluency is required:

$$\text{Magnification} = \frac{12}{8/3} = \frac{12}{2.66} = \text{just over } X4 (+16.00D)$$

As you can see, in theory, even if the near acuity threshold is only slightly reduced, quite a lot of magnification is required to read fluently and the field of view of the magnifier will start to limit the fluency anyway.

In practice it isn't essential to adhere rigidly to this method, but it allows you to establish more realistic goals. If a person wants to read something that requires a degree of reading fluency you should build at least X2 acuity reserve as a starting point (ie wants to read N6 fluently the target acuity should be at least N3). Patients with a near acuity threshold of less than about N24 are unlikely to achieve a high degree of normal print fluency when reading with a magnifier.

Choosing a near low vision aid

Once you have a starting magnification in your head, you then need to consider the nature of the task the person wants to do and the person doing it.

Although possibly similar in the level of magnification, a low vision aid (LVA) that is prescribed to look at prices in the shops will be very different to one that allows the person to read their post. Task requirements to consider are: portability; lighting; use of hands; availability of electric source; and duration of use. A person's ability to handle a device is then taken into account. Things to consider are: the weight and size of the device; ability to change batteries/work controls; ability to maintain focus for the required duration; and ability to grip/hold the device and the task. The advantages and disadvantages of the



FIGURE 2. Try the magnifier with a similar task to the one the person wants to do

TABLE 2. Pelli-Robson chart contrast threshold values (from Brilliant, 1999)

Level of function	Contrast threshold	Chart letters (triplets)	Contrast threshold
<i>Severe loss</i> consider non-optical devices	99 per cent	Top line left Top line right	63 per cent
	44 per cent	Second line left Second line right	31 per cent
<i>Significant loss</i> requires contrast enhancement	22 per cent	Third line left Third line right	15 per cent
	11 per cent	Fourth line left Fourth line right	7.8 per cent
<i>Noticeable loss</i>	5.6 per cent	Fifth line left Fifth line right	3.9 per cent
	2.8 per cent	Sixth line left Sixth line right	1.9 per cent
<i>Normal</i>	1.4 per cent	Seventh line left Seventh line right	1.0 per cent
	0.7 per cent	Eighth line left Eighth line right	0.5 per cent

different types of low vision aids will be outlined in the article on magnification.

A range of devices of the chosen type and magnification can be tried and the parameters adapted according to the patient's feedback. Sometimes starting with simpler, lower-powered LVAs helps the person understand the limitations of magnification and the devices available.

Start by measuring the acuity threshold with the magnifier using a Bailey Lovie near chart and increase the magnification until you are getting the desired acuity threshold. Then try the LVAs with a test type which has paragraphs of text so that you can get a feel for how they manage with sentences of text and changing line etc. The McClure reading test is good contrast, gives a series of texts at each font size and has a top hinge so that it doesn't interfere with LVAs.

You will probably find a few LVAs that give the desired level of acuity for a given task and reasonable handling. Assessing these with a task similar to that expressed by the patient (eg looking at photographs or reading instructions on packets) will allow the final choices to be made (Figure 2). Therefore, having a good range of everyday reading material available will help.

Consider contrast

Some patients' reading ability will not improve as you increase magnification. More often than not these are the patients with a significant or severe reduction in



FIGURE 3. Hand-held telescope

contrast threshold (Table 2). If a person has very reduced contrast sensitivity, CCTVs, which enhance contrast and magnify, may help them to achieve their goal.

Distance low vision aids

The principle for prescribing distance low vision devices is the same as near. Once you have a starting magnification in your head you should consider the nature of the task the person wants to do and the person doing it. If the person is sitting down for the task then a spectacle-mounted device should be considered. For outdoor tasks, such as seeing street names, a hand-held telescope or binoculars may be more appropriate (Figure 3).

You need to assess the person's ability to handle the device carefully as few people manage to master distance aids. Start by trying the LVAs with a test chart and then

assess their use with a task similar to that expressed by the patient. Don't be afraid to take people into the street with it.

OTHER STRATEGIES

Optical low vision aids or magnifiers will not be the answer for everyone or for all the problems a person expresses. For some goals, advice about lighting and/or contrast will be important. Often other forms of magnification are a better option such as increasing the size of the task (large print or a big button phone) or reducing the viewing distance (sitting closer to the television). For some people, their contrast sensitivity, visual acuity or ability to hold an LVA may require sight substitution strategies to be employed for some or all tasks. Many of the non-magnifying solutions available are described in more detail in future articles.

For most people a combination of lots of strategies will be needed eg talking books for reading novels, large print bills, an illuminated stand magnifier for reading the TV listings, sitting closer while watching the television, using a black felt tip pen to write notes and using a hand magnifier for reading prices in shops and instructions on tablet bottles.

INFORMATION

Giving people information about their eye condition, the LVAs you have prescribed and other services and organisations available is an essential part of any low vision service (Figure 4). In focus groups, people using low vision services expressed a desire to be given more by practitioners.² Information allows people and their families to understand what is happening and empowers them to seek assistance themselves. A comprehensive list of local services and a range of information leaflets should also be held by those providing a low vision service.

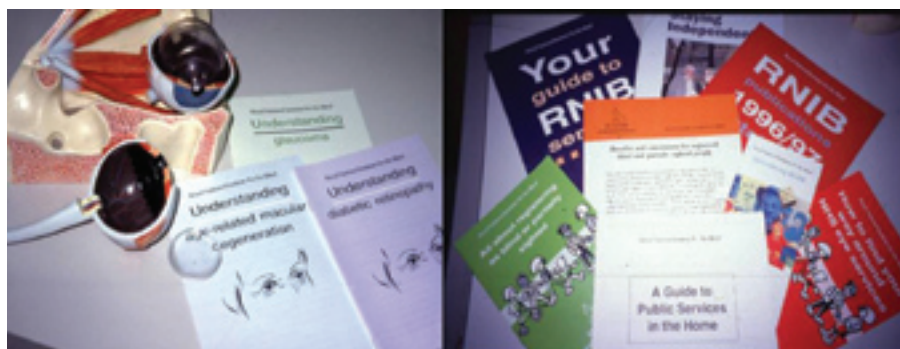


FIGURE 4. Providing information is an important part of a low vision service

REFERRAL TO OTHER AGENCIES

As a low vision practitioner you will not

be able to address all the person's needs and often another professional or agency will be better placed than you to provide a given solution. People with low vision may benefit from input from a large number of services and professionals and referral to them is an essential part of any low vision service. More information about the key professionals and agencies is given in a future article.

REVIEWING THE GOALS

When the consultation is coming to an end, it is important to review the goals set at the beginning of the consultation with the person. Go through each one and say how you think the person will best be able to achieve them. This will require you to explain again any spectacles and LVAs you have prescribed, referrals you have made and information you have given.

BASIC INSTRUCTION IN THE USE OF LOW VISION AIDS

When the person collects their low vision aid it is important to give basic instruction in its use. This should include information about which glasses to use with it, which eye, how to switch it on, change batteries, and holding it for best results. More information on basic training with low vision aids is covered in a future article.

FOLLOWING UP LOW VISION PATIENTS

Following up low vision patients is important. This will allow you to:

- ◆ Establish how the person managed with their low vision aid and work on any problems they encountered
- ◆ Ensure aids and spectacles dispensed are the most appropriate
- ◆ Go over basic training in the use of the aid(s)
- ◆ Clarify points not understood or forgotten from the assessment
- ◆ Address problems you didn't have time to address in the first appointment. For example, telescopes are often prescribed at the second appointment once the person's ability to use simple LVAs can be assessed
- ◆ Check progress of referral to other agencies.

The number of follow-ups required will depend on the person, what you have prescribed and other services available in your area. The Welsh Low Vision Service requires practitioners to follow everyone up at least once in a year and always within a couple of months of a person receiving LVAs. Practitioners can choose to follow-up by telephone initially and bring the person back if needed.

It is important to remember that a low

MULTIPLE-CHOICE QUESTIONS

1 With regard to prescribing spectacles for visually impaired patients, which of the following is true?

- A Any measurable improvement in acuity is always worth prescribing
- B A correction is best prescribed only when at least two lines of acuity improvement may be demonstrated with the correction
- C The majority of patients attending modern low vision services are prescribed spectacles
- D Changes in refractive error override any other considerations when deciding upon prescribing spectacles

2 Assuming a starting point working distance of 25cm for unit magnification, what is the magnification achieved by an addition of +16.00D?

- A 2X
- B 2.5X
- C 12X
- D 4X

3 What is the expected working distance for a +12.00D reading addition?

- A 25cm
- B 8.33cm
- C 12.66cm
- D 5cm

4 What might be the expected magnification for a telescope required to help a patient currently seeing 6/36 to read the 6/6 acuity line?

- A 2X
- B 4X
- C 6X
- D 8X

5 What might be the theoretical required target acuity size to be seen by magnification for a patient wishing to read N12 size print fluently?

- A N6
- B N8
- C N4
- D Not possible to do this

6 A patient reads the top five full lines on a Pelli Robson charts. What might best describe their contrast threshold?

- A 99 per cent – severe loss
- B 5.6 per cent – noticeable loss
- C 3.9 per cent – noticeable loss
- D 22 per cent – significant loss

The deadline for responses is Thursday, January 5, 2006

Module C2262 To take part in this CET module go to www.opticianonline.net and click on the Continuing Education section. Online participation allows participants to have an instant decision of success. Successful participation in each module of this series counts as one credits towards the GOC CET scheme administered by Vantage and one credit towards the Association of Optometrists Ireland's scheme.



vision service is a rehabilitative process. Your role is to address the person's needs and discharge them. It is valid to re-assess the person every year or two, but six-monthly follow-ups ad-infinitum are usually unnecessary.

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Further Reading

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