

# Vision Assessment and Prescription of Low Vision Devices

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Assessment of vision and prescription of low vision devices are part of a comprehensive low vision service. Other components of the service include training the person affected by low vision in use of vision and other senses, mobility, activities of daily living, and support for education, employment or leisure activities. Specialist vision rehabilitation agencies have services to provide access to information (libraries) and activity centres for groups of people with impaired vision.

At a tertiary low vision clinic, a team of low vision specialists assesses infants, children and adults who need complex assessments and high power low vision devices. The staff in a tertiary clinic would also provide training and support for secondary level clinics and primary low vision care. Secondary low vision clinics can provide low and medium power magnification devices and rehabilitation.

## Vision Assessment

The low vision assessment is usually conducted by an ophthalmologist or optometrist but could be carried out by an appropriately trained orthoptist (vision therapist/ophthalmic technician), ophthalmic medical officer or other health worker.

The aim of the first appointment is to understand how low vision has impacted on

the person's daily activities and what he or she does or wants to do. At the end of the interview there should be an understanding of what low vision devices and other low vision services the person needs. The essential question is, how has the impaired vision affected the person's quality of life?

## Visual Acuity

To assess both near and distance vision it is essential to use LogMAR tests rather than traditional Snellen tests. In a LogMAR (logarithm of the minimum angle of resolution) test the 'steps' between each size are the same throughout the test. This is necessary to determine the need for magnification. Typically, the distance visual acuity tests based on designs by Bailey and Lovie<sup>1</sup> have 5 letters in each line so that there are sufficient symbols to reliably test both good and poor vision (Figure 1). Other tests use the logarithmic principle of regular steps in size but have been produced as single letters or groups of letters, numbers or symbols on cards. The directional E, Landolt rings and LH symbols can be used when letters or numbers cannot be named. Matching tests such as the LH symbols were designed to test vision of young children (Figure 2).

Vision should not be described as 'count fingers' or 'hand movements'. The test distance should be reduced to obtain a measure of distance visual acuity so that the required magnification can be calculated.

**Distance visual acuity** should be measured with a pinhole to assess possible refractive error. A multiple pinhole is preferable for people with low vision.

Ideally, **near vision** should be tested using passages of print (in the LogMAR format) but if not possible, letters, numbers or symbols can be used. The smallest print read and the distance should be recorded. Magnification is prescribed to improve the reading distance, print size able to be read, or both.

**Contrast sensitivity** is the ability to detect objects at low contrast. Contrast sensitivity is usually tested with letters, numbers or symbols at standard or intermediate distances. This measure has been shown to relate visual functioning and activities of daily living more closely than visual acuity measured with high contrast tests. As contrast sensitivity is usually affected in people with low vision, it is an important test to help in the prescription of low vision devices, so that lighting and other non-optical devices can be considered.



**Fig. 2: Demonstration of LH cards used to test visual acuity in children**

*Photo: Richard Le Mesurier*

Similarly, people with eye disease causing low vision are often severely affected by **glare**. Vision should be tested under various levels of lighting to determine if filters are needed to reduce glare.

A list of equipment to assess vision has been recommended by the WHO/IAPB Low Vision Working Group (WHOLVWG) as the minimum needed to set up tertiary, secondary and primary level low vision clinics (page 8).

**Refraction** is an essential part of a low vision assessment to ensure the most appropriate correction of refractive errors. Most low vision devices are used in conjunction with refractive correction. For many older people, their low vision devices will be bifocal glasses with a 'high plus' reading addition in the lower segment of the glasses.

Components of a **routine eye examination** should also be included such as the external and internal examination of the eyes to determine ocular health, testing of visual fields and colour vision. As mentioned previously, the WHOLVWG has prepared a list of the minimum requirements and this includes ophthalmic equipment required to set up a low vision clinic (page 8). Most of this would normally be available in an eye clinic and so might not need to be specially purchased for a low vision clinic.

Assessment might not lead to the provision of low vision devices but will add important information for the person with low vision, their family, eye/health workers, rehabilitation workers or educators, and for planning programmes.



**Fig. 1: LogMAR distance visual acuity chart**

## Prescription of Low Vision Devices

Low vision devices (LVD) help low vision patients to maximise their remaining vision and live independently. Types of LVDs are described in more detail in the article 'Low Vision Devices and Training' on pages 6, 7 of this issue. Basically, LVDs are either optical or non-optical. Optical devices have one or more lenses to modify or enlarge an image and they need to be prescribed by an eye care worker (ophthalmologist, optometrist or refractionist). Non-optical devices do not have a lens system but can make it easier to see objects. They can be prescribed as part of a low vision assessment but are often recommended by educators or rehabilitation workers.

LVDs should be considered for all ages from young children to the oldest adults. LVDs are not just for reading but are designed to observe the world around us – children can inspect toys and look for animals. Use of magnifiers is preferred

instead of preparing material in large print.

To prescribe LVDs the following should be taken into account:

- Types of tasks at home, work or school (Near, intermediate or distance)
- Outcome, e.g. N8 print size (newsprint) or 6/12 distance acuity
- Hands free or hand needed to hold/guide LVD
- Non-optical devices used in combination, such as lighting, bold pens for writing.

The power of the magnifier is calculated from the LogMAR visual acuity. For example, if the best corrected acuity is 6/75 (20/250) or 0.08 and the desired outcome from magnification is 6/12 (20/40) or 0.5, a 6x magnifier should be tried. This is obtained by dividing the denominators (75 by 12) or from the decimal equivalents  $0.08/0.5 = 6.25$ . The magnifier should be tried with the material or objects needed by the patient. Magnification prescribed should be

as low a power as possible to give a wider field of view.

Most LVDs are difficult to use because of the limited field of view through the lens. Training is necessary for both children and adults. It is important that they understand how to use the device/s prescribed and the limitations.

## Referral

After the low vision clinic assessment and prescription of LVDs, the need for training or other services should be discussed with the patient and family. Low vision clinic staff need to be aware of the range of specialist and community-based services that could be needed by people with low vision.

## Reference

- 1 Bailey IL, Lovie JE. New design principles for visual acuity letter charts. *Am J Optom Physiol Opt* 1976; 53:740-745.



## THE ROYAL COLLEGE OF OPHTHALMOLOGISTS

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### EXAMINATIONS CALENDAR 2004 (UK and OVERSEAS)

#### UK Examination Dates

Examination	Applications and Fees Due	Essay and/or MCQ Papers	Clinicals/Orals/OSES <sup>+</sup> /OSCES <sup>+</sup>
Part 1 MRCOphth	31 August 2004	11–12 October 2004	None
	29 November 2004	24–25 January 2005	None
Part 2 MRCOphth	4 May 2004	14 June 2004	14–18 June 2004
	20 September 2004	1 November 2004	1–5 November 2004
	February 2005 (additional centre- TBC)	February 2005 (additional centre- TBC)	February 2005
Part 3 MRCOphth*	19 January 2004	1 March 2004	1–5 March 2004
	2 August 2004	13 September 2004	13–17 September 2004
	10 January 2005	7 March 2005	7–11 March 2005

This examination has changed since September 2003: please contact the Examinations Department for further details

Diploma in Ophthalmology (DRCOphth) – 2004	17 May 2004	28 June 2004	28–30 June 2004
	4 October 2004	15 November 2004	15–17 November 2004

From November 2001, there has been no practical refraction section in the Diploma Examination

#### India Examination Dates: Aravind Eye Hospital, Madurai, Tamil Nadu, South India

Provided a minimum of six candidates are booked to sit, the Parts 1, 2 and 3 Membership Examinations are scheduled to be held on the following dates

Part 1 MRCOphth	31 August 2004	11–12 October 2004	None
Part 1 MRCOphth	28 February 2005	25–26 April 2005	None
Part 2 MRCOphth	31 August 2004	13 October 2004	13–14 October 2004
Part 3 MRCOphth	31 August 2004	14 October 2004	14–15 October 2004

\* Any changes in any of the above dates will be posted on the website and within application packs  
+ Objective Structured Examination and Objective Structured Clinical Examination

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