LIGHT UP

A Publication of
Vision Rehabilitation Centres

Newsletter 19
April 2006

L V Prasad Eye Institute
L V Prasad Marg, Banjara Hills
Hyderabad, INDIA

World Health Organization
Collaborating Centre for Prevention of Blindness

Meera & L B Deshpande Centre for Sight Enhancement
&
Dr P R K Prasad Centre for Rehabilitation of Blind and Visually Impaired

Contents

Solutions for glare problems in patients with low vision

Photophobia or extreme sensitivity to light and glare can be a severe problem for many low vision patients. A clear medium is required for a clear image to be formed on the retina. Opacities of the ocular medium create intraocular light scatter that can significantly reduce effective vision. The eyes of low vision patients can thus become hypersensitive to what the normal eye sees only as moderate glare.

Shorter wavelengths, the high-energy part of the visible spectrum, dominate the light in the day and contribute to glare. Patients of low vision complain of intense light sensitivity and hazy vision due to glare and their visual functioning is impaired.

What is glare?

Glare is a visual condition in which the observer either feels discomfort and/or performs poorly in visual tests. There are two types of glare:

Discomfort glare: This kind of glare occurs when a light source is just too strong for the eyes. It may cause the person to screw up or shade the eyes, or even close them.

Disability glare: Disability glare reduces visual performance and can be caused by eye diseases. It can occur with ordinary light sources and levels of light.

Photophobia: This is an abnormal fear or intolerance to light.

Adaptation to the dark: Adjustment of the eye such that after observation in the dark, sensitivity to light is greatly increased.

Questions to ask about the patient

1. How does the patient function in bright sunlight, with indoor lighting and at night?
2. Are sunglasses worn – what color and type?
3. Does the patient use a hat or visor?
4. Does light and glare affect the patient's mobility?
5. Does the patient have difficulty adapting from different light levels?
6. Is there a residual decrease in vision after coming inside from a bright light?
7. How does the patient function at night?

Diseases causing glare problems in patients with low vision

Glare is perceived by a patient whenever light is scattered somewhere between the source and the retina. This can occur at the level of the tear film, cornea, anterior chamber, lens or the vitreous. The eye diseases that cause glare in patients with low vision are:

- Ocular albinism
- Cone dystrophy
- Cataract
- Aniridia
- Corneal disease
- Macular degeneration
- Diabetic retinopathy
- Glaucoma/Optic atrophy
- Retinitis pigmentosa

Glare Testing

This is crucial for choosing proper levels of illumination for tasks such as reading, and to establish whether there is a need for sunglasses. Checking with different types of glare during clinic based assessments, followed by trials in the real world, would help identify more people who can benefit from tinted lenses (Silver and Lyness, 1985; Leat et al, 1990; Tupper et al, 1985).

A. Mentor Brightness Acuity Tester (BAT): The simplest method of testing glare is to measure the deterioration of visual acuity or contrast sensitivity while shining a strong light towards the patient's eye at an oblique angle. Viewing through the aperture in the BAT and wearing the best subjective distance correction spectacles, the patient is asked to read the distance chart under low, medium, and high illumination settings. The other eye is occluded or covered. The test is considered positive if the acuity drops significantly as illumination is increased (Fig. 1).

Fig. 1: Mentor Brightness Acuity Tester (BAT)

B. Outdoor trials: When BAT is not available, the patient can be taken outdoors and exposed to the sunlight. The patient can be given trials with a number of different tinted lenses and the tint most effective in glare reduction recommended.

Lighting and glare control

Absorptive/tinted lenses: Such lenses are currently used by eye care practitioners to assist people with low vision to maximize the use of residual vision, improve visual function, control glare and improve orientation and mobility skills. The tinted lenses can be worn separately, over the current eyeglasses or they can be made with the prescription. Full coverage sunglasses that provide opaque or translucent side shields are preferred.

1. Fixed tints: Coloured lenses with specific tints that restrict different wavelengths of light, are often used to help people with light sensitivity. The colours of these tints range from yellow, brown and gray to greens and blues. As of now there is no strong evidence to suggest that a particular shade or tint suits one eye condition over another, and it would appear that choosing the tint is a matter of personal choice. For example, two persons with macular degeneration may prefer two completely different coloured tints.

2. Photochromic (gray, brown and ambermatic): Some people prefer to have light activated sunglasses, which become darker in bright light.

3. Filters: They come in different tints at various levels of absorption and different cut-off points. They provide contrast enhancement and help in light adaptation (Tupper et al, 1985) (Fig. 2).

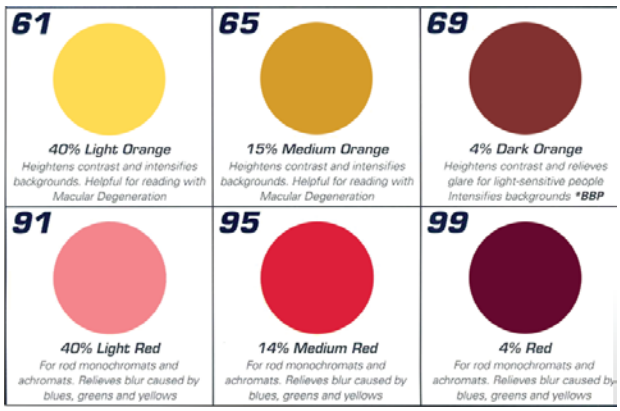

Fig. 2: Filters

a. *Corning Photochromic Filters (CPF®)*: Short wavelength light has been shown to cause visual discomfort, hazy vision, reduced contrast and prolonged adaptation times (Leat et al, 1990). CPFs can alleviate some or all of these effects by filtering out blue light in the visible portion of the specturm, at the wavelengths that create problems for the photophobic or aging eye. They are designed to filter short wavelength light of solar or artificial origin (Fig. 3 & 4).

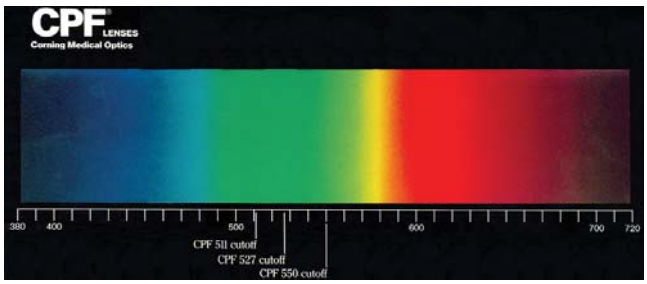

Fig. 3: Visible spectrum

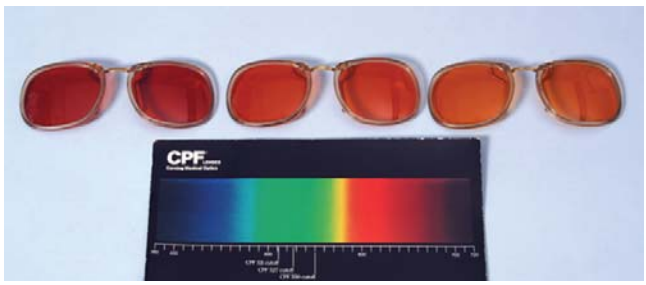

Fig. 4: Corning Photochromic Filters (CPF®)

b. *UV Shield® and NoIR filters®:* UV Shields provide protection for 100% UV and visible light. The NoIR filter eliminates near infrared 100% UV and provides visible light protection for maximum eye comfort. The cost is relatively low (Fig. 5).

Fig. 5: UV Shield® and NoIR filters®

4. Polarized lenses and anti-reflecting (AR) coatings: Polarized lenses and anti-reflecting (AR) coatings cut down on the reflected glare from flat surfaces, for example, light reflected off water or off the bonnet of a car.

Adaptation to glare and darkness: Some eye conditions can create a lot of difficulty for people when moving between areas with different lighting levels, such as from the sunlight to a dim room, or vice versa. It may be necessary for them to pause and put on sunglasses or take them off, and give the eyes time to adjust. It is important that the person does not feel rushed in such situations. Often these changes in light levels occur at the entrance of the building, which is particularly dangerous as there are usually steps at such places. Filters help in light adaptation.

Other methods of coping with light sensitivity: Too much light or light directed straight at the patient can impair performance. A moderate increase in light can help low vision patients with reduced contrast to perform better. Some methods and means are:

a. **Reading lamp with an adjustable arm** allows the patient to position the light optimally and minimize glare. Incandescent or fluorescent light in the yellow spectrum seems to be better than the standard fluorescent or halogen light that contains relatively more of the blue spectrum, which tends to scatters more.

b. **Typoscope –** a black, non-reflective plastic card with a rectangle cut out of it may eliminate reflections from a white page while reading.

c. **Reverse polarity** on a closed circuit television (CCTV) with the projected text displayed as white letters on a black screen, rather than black letters on a white screen, can be helpful for patients.

d. **A hat with a wide brim or a sun visor** can help cut down glare and facilitate mobility outdoors.

e. **Non-gloss** flooring, Venetian blinds or curtains can minimize light reflections in the normal environment.

References

Silver JH, Lyness AL. Do retinitis pigmentosa patients prefer red photochromic lenses? Ophthalmic Physiol opt. 1985;5 (1): 87-89.

Leat SJ, North RV, Bryson H. Do long wavelength pass filters improve low vision performance? Ophthalmic Physiol opt. 1990 Jul; 10 (3): 219-24.

Trupper B, Miller D, Miller R. The effect of a 550 nm cutoff filter on the vision of cataract patients. Ann Ophthalmol. 1985 Jan; 17 (1): 67-72.

Case study: The story of three sisters

Asma, Rehana and Nazma Sultana – aged 5, 6 and 7 – were pretty little maids in a row as they skipped into the gates of L V Prasad Eye Institute. Their father, a daily wage earner, had vanished when he learnt that all his children suffered from a strange eye problem that could, probably, never be cured. The mother was left to fend for herself and look after the girls.

The little girls were diagnosed to have cone dystrophy. Nazma was studying in the first grade then, Rehana in upper kindergarten and the youngest Asma in lower kindergarten.

The girls were extremely sensitive to glare, preferring to look down while walking, and squinting or blinking against bright light. They were unsure of their movements in bright sunlight, as their vision was hazy. The children's performance improved significantly when a gray tint was incorporated into their glasses; They could read by holding the book close to the eye. The children were advised to use a peaked cap. Such simple devices stopped the glare from hurting their eyes. The mother was encouraged to help the children participate in outdoor games to reduce the feeling of isolation they had at school.

You can make a difference

Your contribution can help the Vision Rehabilitation Centres in several ways: provision of low vision devices to underprivileged children, training optometrists in detection and rehabilitation of the blind and those with incurable low vision, and conducting community programs for rehabilitation of persons with visual impairment.

Contributions to the Hyderabad Eye Institute and Hyderabad Eye Research Foundation are tax deductible. Donations above Rs 250 are exempt under Section 80G of the Income Tax Act 1961 for Hyderabad Eye Institute and under section 35(i) (ii) for Hyderabad Eye Research Foundation.

For more information please contact

Vision Rehabilitation Centres

L V Prasad Eye Institute

L V Prasad Marg, Banjara Hills
Hyderabad 500 034, India
Ph: 91 040 3061 2821, 2354 2790
Fax: 91 040 2354 8271
email: sarfaraz@lvpei.org Web Site: www.lvpei.org

Greeting cards based on paintings by children with visual impairment are available for sale. Please contact Vision Rehabilitation Centres, LVPEI.