Basic Concepts and Terms for Low Vision Rehabilitation

August Colenbrander, Donald C. Fletcher

Key Words: blindness • low vision • vision loss

As the involvement of occupational therapists in the rehabilitation of people with visual impairments increases, it is important for all professionals involved to communicate clearly by using the most accurate terminology. This article suggests the most appropriate use of terms and concepts. It recommends that the distinctions between the various aspects of vision loss be recognized and that the old dichotomy of legally blind versus legally sighted be replaced by the more detailed classification of the International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM), which recognizes multiple levels of visual performance.

Low vision is a common physical impairment in the United States. It can occur at any age, but its prevalence increases with age. As the proportion of elderly persons in our population increases, serious vision loss is expected to become more prevalent (Tielsch, 1994). Thus, it is inevitable that occupational therapists will be involved more often in rehabilitation of persons with visual impairments even if they are not specifically working in a low vision rehabilitation program. The dedication of this special issue of the American Journal of Occupational Therapy to rehabilitation of persons with visual impairment is evidence of this increasing involvement.

A study of a rehabilitation unit in a New York Hospital found that 5.8% of the admissions to the rehabilitation inpatient unit met the criterion for legal blindness although none of the patients were admitted for that diagnosis (Wainapel, 1989). More than two thirds of those with vision impairments are older than 65 years. Among persons aged 65 years and older, 6.8% have a moderate or more marked visual impairment; among persons aged 85 years and older, this incidence reaches 25% (Nelson, 1987). For those older than 70 years, vision loss ranks third among the chronic conditions that cause a need for assistance in activities of daily living, behind arthritis and heart disease (LaPlante, 1988). A recent report in the New England Journal of Medicine confirmed these findings (Tielsch, Javitt, Coleman, Katz, & Sommer, 1995).

Because rehabilitation is always a team effort, it is important for all professionals involved to use the most accurate terminology. This article suggests the most appropriate use of various terms and concepts.

Basic Concepts and Terms

Low vision is not a single condition. Some persons classified as having low vision suffer visual acuity loss, others suffer visual field loss; some benefit from more light, others need dark glasses, and so forth. Successful low vision rehabilitation requires an understanding of this diversity of physical conditions and needs. In many instances, this understanding is hindered by the lingering legacy of the simplistic black-and-white dichotomy between those who are called legally sighted and those who are legally blind. Basic terms are reviewed below.

Vision loss is a relatively neutral term that can be used to describe any type or degree of change in vision. It may apply to visual acuity loss as well as to visual field changes. It may apply to those who have lost only a little vision, as well as to those who have little vision left.

Blindness, by definition, is total loss of sight. Unfortunately, distortions of this term have crept into common

More people are BLINDed by DEFINITION than by any other cause.
—Jahoda, personal communication, no date available

August Colenbrander, MD, is Director, Low Vision Services, Department of Ophthalmology, California Pacific Medical Center, San Francisco, California.

Donald C. Fletcher, MD, is Clinical Professor, Department of Ophthalmology, University of South Florida, Fort Myers, Florida 33906.

This article was accepted for publication February 24, 1995.

The American Journal of Occupational Therapy
usage. In a technical sense, the use of the word blindness has often been diluted by extending it to conditions of partial vision loss, as in legal blindness, and even to minor deficiencies, as in color blindness. In the emotional realm, many associate blindness with the hapless condition of a beggar selling pencils on a street corner sooner than with the image of a successful blind executive. Thus, the term blindness has become associated more with the pitiable feelings surrounding vision loss than with the type or degree of vision loss itself. No wonder, then, that many patients are said to fear blindness more than death.

The term legal blindness originated in the 1920s and 1930s. The U.S. definition of “20/200 or less” (Department of Health and Human Services, 1986; Snell, 1925) was based on the finding that employability was considerably reduced at this level of vision loss, a relationship more clearly reflected in earlier terms such as industrial or occupational blindness. Unfortunately, the widespread use of the term legal blindness to denote severe vision loss perpetuates black-and-white thinking. It is as preposterous to call a patient with severe vision loss legally blind as it would be to call a severely ill patient legally dead. As rehabilitation professionals, dedicated to the effective use of residual vision, we should fight these distorted perceptions by avoiding the term blindness when we are actually referring to lesser levels of vision loss.

The simplistic dichotomy of vision—blindness was officially abandoned in 1975 when the World Health Organization (WHO) in the ninth revision of the International Classification of Diseases (ICD-9 for use worldwide, ICD-9-CM for use in the United States) (1978) recognized that there is a vast gray area between normal vision and blindness. This area is referred to as low vision. The word low indicates that vision is not normal, the word vision indicates that it is not blindness. The condition of low vision is at least 10 times more prevalent than is actual blindness (Tielsch, 1994).

Aspects of Vision Loss

Like a modern sculpture that may appear quite different when viewed from different angles, vision loss may be considered from various points of view. The terms visual disorder, visual impairment, visual disability and visual handicap, although often used as if they were synonyms, actually describe different aspects and points of view. The terms visual disorder and visual impairment focus on the condition of the visual system, whereas visual disability and visual handicap describe the condition of the person (see Table 1).

The distinctions among disorders, impairments, disabilities, and handicaps is not limited to vision. It can be applied to any organ system. The WHO has promoted and standardized the use of these terms in the International Classification of Impairments, Disabilities and Handicaps (ICIDH) (WHO, 1980) as a companion volume to the ICD-9.

The term visual disorder refers to the anatomical condition that causes vision loss. Disorders are described in anatomical terms: cataract, retinal scar, optic atrophy, and so forth.

The anatomical condition by itself, however, does not describe how well the eye functions. The functional status of the visual system is described under the term visual impairment, in terms of functional measurements, such as visual acuity, visual field, and contrast sensitivity. These measurements indicate how well each eye functions on standardized clinical tests but do not describe how well the person functions in everyday tasks. A visual disability does not refer to the condition of the eye but to the ability of the person as a whole. To measure and describe the ability or disability of the person requires broader descriptors, such as daily living skills, vocational skills, orientation and mobility skills, reading skills, and writing skills.

Visual disability may be a consequence or result of visual impairment, but this is not a fixed relationship. It is also influenced by training and by the availability of aids. One of the primary goals of rehabilitation is to exploit this flexibility to optimize one’s abilities in the presence of a given impairment. Indeed, if the relation between impairment and ability were rigidly fixed, rehabilitation would

<table>
<thead>
<tr>
<th>Visual Disorder</th>
<th>Visual Impairment</th>
<th>Visual Disability</th>
<th>Visual Handicap</th>
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</thead>
<tbody>
<tr>
<td>anatomical changes</td>
<td>functional changes</td>
<td>skills and abilities</td>
<td>social, economic consequences</td>
</tr>
<tr>
<td>Examples: corneal opacity, cataract, retinal scar, optic atrophy, stroke</td>
<td>visual acuity, visual field, color vision, night vision, ocular motility</td>
<td>reading skills, writing skills, ADL skills, mobility skills, vocational skills</td>
<td>need for extra effort, loss of independence, loss of earning potential</td>
</tr>
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Describing a person's abilities is important, yet it does not indicate how that person's role or place in society is affected. The term *visual handicap* refers to the societal and economic consequences of vision loss and may be described in terms of the extra effort a person has to use to obtain the same goal and in terms of independence and interdependence issues such as economic independence, independent living, and independent mobility.

Handicaps depend not only on the condition and skills of the person, but also on the physical environment (good lighting and contrast, in the case of vision). Attitudes and expectations in the human environment (involvement and education of a spouse, employer, or teacher) may also be very important. Furthermore, the same impairment–disability may present different handicaps for different tasks: uncorrected nearsightedness may not be a handicap for a jeweler; it is a serious handicap for a hunter. Here again, the flexibility of the link between impairment–disability and handicap provides the working space for rehabilitation.

Some examples of proper terminology are as follows:

- Services for the visually handicapped refer to services aimed at improving the general quality of life for persons with vision loss. In this context the term *handicap* is appropriate because one is dealing with social and economic consequences.
- Benefits for the visually impaired refer to benefits available at a certain level of impairment. Use of the term *impairment* is appropriate because eligibility criteria are usually based on impairment levels. Impairment can be measured more easily and more objectively than skills or handicaps. Describing benefits for the legally blind as benefits for the severely visually impaired (without any change in eligibility criteria) would greatly reduce the psychological stigma most patients experience from the label *legal blindness*.
- Health surveys often include questions about the ability to read newsprint. Inability to do so is reported as *visual impairment*. This term is inappropriate because the question refers to reading skills, not to a visual acuity measurement. A better term would be *visual disability*.
- Inability to earn a living or to hold a job due to vision loss describes a socioeconomic consequence and should be referred to as a *visual handicap*.

### Levels of Visual Performance

Replacement of the dichotomy between legally sighted and legally blind by the three main categories of normal vision, low vision, and blindness, is a beginning. For accurate clinical work, additional detail is needed. The left side of Table 2 (based on ICD-9-CM), provides a further subdivision into seven subcategories or impairment ranges. Each of these ranges contains four lines on the standardized visual acuity scale.

The right side of Table 2 contains a similar breakdown of reading ability, the ability most affected by visual acuity impairment. On average, there is a good correlation between the two classifications, but this correlation is only an estimate. The actual abilities of any patient are also greatly influenced by training, motivation, and the availability of aids.

#### Normal Vision

The normal vision range covers 20/12, 20/16, 20/20, and 20/25. Note that normal vision is not limited to a single value and that the range extends beyond 20/20. The 20/20 level is a reference standard; average normal vision is better than 20/20. Just as the U.S. measurement of 1 foot is defined physically and not as the average length of American feet, standard vision is defined on the basis of physical parameters (visual angle), not on average vision (International Council of Ophthalmology, 1984; Snellen, 1862).

Standard vision refers to the ability to just be able to read a standard letter size (1M print, average newsprint size) at a standard distance (1 meter, 40 in.). Visual acuity as measured on a letter chart refers to threshold acuity; in reading, we normally bring newsprint two or three times closer (33 cm–50 cm, 13 in.–20 in.); that is, we read most comfortably at two to three times the threshold.

#### Near-Normal Vision

The near-normal vision range covers 20/30, 20/40, 20/50, and 20/60. A person with 20/60 (1/3) can just read newsprint (1M) at ¼, the standard distance of 1 meter (40 in.) -- that is, ¼ m (33 cm, 13 in.). Moving the print a little closer, say, to 25 cm (10 in.) provides some spare capacity. Persons in the near-normal range can generally read by bringing the print closer, which may require using a stronger reading glass prescription (up to 4 diopters).

A 25-cm reading distance is generally considered the closest comfortable distance for prolonged reading; it is used as the reference distance to express the magnifying power of magnifiers.

#### Moderate Low Vision

The moderate low vision range covers 20/80, 20/100, 20/125, and 20/160. Persons in this range must bring the print closer than 25 cm (10 in.), which is not comfortable for prolonged use, unless convergence is aided by base-in prism in reading glasses. For this group of patients, low-power magnifiers are also of assistance.
Table 2
Degrees of Vision Loss

<table>
<thead>
<tr>
<th>CLASSIFICATION of VISUAL IMPAIRMENT</th>
<th>DIS-ABILITY ESTIMATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near-normal vision 20/30 40 50 60</td>
<td>(Near-)normal performance with magnifiers, other aids.</td>
</tr>
<tr>
<td>Moderate Low Vision 20/80 100 125 160</td>
<td>Slower than normal, with aids. (<em>legal blindness</em> U.S.A.)</td>
</tr>
<tr>
<td>Severe Low Vision 20/200 250 300 400</td>
<td>Limited reading with aids. Orientation, Mobility problems.</td>
</tr>
<tr>
<td>Profound Low Vision 20/500 600 800 1000</td>
<td>Vision unreliable.</td>
</tr>
<tr>
<td>(NEAR) BLINDNESS Near-Blindness 20/1250 1600 2000 2500</td>
<td>No vision.</td>
</tr>
<tr>
<td>Total Blindness NLP</td>
<td></td>
</tr>
</tbody>
</table>

Persons with moderate low vision can generally maintain near-normal reading speeds with these aids, but students may have difficulty keeping up with normal classroom tasks. Special education teachers and other educational assistance are generally made available to persons in this range of vision.

Severe Low Vision
The severe low vision range covers 20/200, 20/250, 20/300, and 20/400. If visual acuity is worse than 20/200 (1/10), the reading distance for average newsprint (1 M) must be closer than 1/10 m (10 cm, 4 in.). At these distances, binocularity cannot be maintained any longer, even with prisms; the diameter of optical magnifiers cannot be made large enough to allow binocularity either. Consequently, persons in this group must use their best eye for reading, while ignoring or covering the other eye. One exception to this rule is when a video magnifier (closed circuit television [CCTV]) is used; this equipment can provide a high level of magnification on a video screen, which can be viewed binocularly.

Persons with severe low vision can read, but their reading will be slower than normal. Often they will start to use other senses as an adjunct to vision (e.g., listening to the radio rather than reading the newspaper). We refer to these techniques as vision substitution rather than vision enhancement. In the United States, government regulations consider persons with this level of vision loss as legally blind (an unfortunate term, as discussed previously). A variety of additional services and benefits is available to these persons.

Profound Low Vision
The profound low vision range covers 20/500, 20/600, 20/800, and 20/1000. Reading distances for persons with profound low vision must be less than 5 cm (2 in.). In this range, recreational reading is often considered too laborious to be enjoyable; reading will generally be limited to essential materials (spot reading). Use of a video magnifier (CCTV), which is helpful at previous levels, may be-
come mandatory in this range. The same holds true for alternative techniques based on the use of senses other than vision (talking books, tape recordings, use of readers). In the WHO classification and in many European countries, persons do not qualify for tax benefits until they have reached this level, although other benefits may be available earlier.

Near-Blindness

The near-blindness range covers persons with less than 20/1000 vision. These persons will often find their vision unreliable. In this range, vision becomes an adjunct to other senses. Most of the emphasis in rehabilitation for this group will be on vision substitution skills and devices. Vision substitution devices may range from low-tech, such as braille, a long cane, raised tactile dots on a thermostat dial and books on tape, to high-tech, such as talking clocks and other computer voice output devices.

Blindness

This term should be reserved for persons who have no vision at all. As discussed previously, it is inappropriate and misleading to use this term for persons with residual vision.

Conclusion

As the field of low vision rehabilitation moves forward within the health care community, it will be beneficial for both clinicians and researchers to use accurate universal terminology. Such use will maximize communication and team work and foster further development of rehabilitation techniques.

References


