



# CAUSES AND SYMPTOMS OF LOW VISION

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## INTRODUCTION

This chapter includes a review of:

- Common causes of low vision
- Low vision symptoms and conditions
- Functional implications of diseases causing visual impairment

## CAUSES OF LOW VISION

In order to gain a better understanding of the nature of residual vision, we need to examine the causes of low vision. Listed below are some causes of low vision:

- Cataracts
- Albinism
- Diabetic retinopathy
- Corneal scarring possibly due to vitamin A deficiency or trachoma
- HIV related disease, e.g. CMV retinitis
- Optic nerve head disease
- Trauma
- Retinitis pigmentosa
- Glaucoma
- Microphthalmos
- Macular degeneration
- Cortical blindness
- Aniridia

A host of other disease conditions result in low vision. These should be consolidated with those mentioned in your ocular disease courses.



## LOW VISION SYMPTOMS AND CONDITIONS

People with low vision may have any of the following: distorted visual acuity, both at near and distance; restricted visual fields; deprived night vision; defected colour vision and/or; severely reduced contrast sensitivity. A low vision person may face great difficulty in performing his/her daily living activities independently. With some eye conditions, a person sees better in the shade, out of bright light. With other eye conditions, the person needs bright light to see well. People with low vision often need more time to do activities than people with normal vision. When using vision for long periods, the person with low vision may become tired more quickly than other people, so it should be suggested that the person takes short rests and then continues with activity. Some people with low vision see larger objects better and find it useful to use large print for reading. However, larger objects are not always the best for some people. The size is not always the most important factor. Other factors such as the distance to the object, amount of light, colour and contrast make the object easier to see.

When considering those conditions that cause vision loss, it is important to consider its symptoms and functional implications on the individual.

## VISION LOSS

Vision loss can be categorised into 3 types:

1. Overall blurred vision
2. Central field loss
3. Peripheral field loss

### 1. Overall Blurred Vision

#### OVERALL BLURRED VISION

Overall blurred vision affects an individual's ability to perceive sharpness of detail (Fig. 2-1a and 2-1b) due to an alteration in the clarity of the refractive structures like the cornea and lens. In addition, abnormalities of the pupil and the vitreous can also contribute to overall blurred vision. Conditions affecting these structures also tend to produce significant change in the individual's contrast sensitivity.



**Figure 2-1a:**  
Scene perceived by a normally sighted person



**Figure 2-1b:**  
Scene perceived in overall blurred vision

Ocular conditions resulting in overall blurred vision

- Cataracts
- Keratoconus
- Microcornea
- Corneal degeneration/dystrophy
- Failed corneal graft
- Dislocated lens
- Aniridia
- Albinism (Fig. 2-2)
- Diabetic retinopathy associated macula oedema
- Corneal scarring
- Vitreous hemorrhage
- Nystagmus
- Achromatopsia
- Amyblyopia

[photos courtesy of LV Prasad Eye Institute (LVPEI)]



**Figure 2-2:**  
Fundus presentation in albinism  
Photo courtesy of LV Prasad Eye Institute (LVPEI)



## 1. OVERALL BLURRED VISION (CONT.)

**Table 2-1: Functional implications and behavioural manifestations in overall vision loss/blurred vision**

<b>FUNCTIONAL IMPLICATIONS</b>	<b>BEHAVIORAL MANIFESTATIONS</b>
<b>LOSS OF VISUAL ACUITY OR SHARPNESS OF DETAILS</b>	<ul style="list-style-type: none"><li>• Difficulty in reading and writing</li><li>• Difficulty in recognizing details like facial features and facial expressions</li><li>• Difficulty in reading road signs</li><li>• Difficulty in orientation and mobility</li><li>• Difficulty in driving</li><li>• Difficulty in grooming</li><li>• Difficulty in using computers</li><li>• Difficulty in signing</li></ul>
<b>IMPAIRED CONTRAST SENSITIVITY</b>	<ul style="list-style-type: none"><li>• Bumping into objects like door frames or furniture</li><li>• Seeing time on watch difficult</li><li>• Identifying coins and currency problematic</li><li>• Difficulty in mobility</li><li>• Difficulty in walking down steps</li><li>• Difficulty in driving and mobility in dim lit area</li><li>• Difficulty in reading poor contrast materials</li></ul>
<b>POOR NIGHT VISION</b>	<ul style="list-style-type: none"><li>• Inability to drive at night</li><li>• Difficulty in finding way in dark places</li></ul>
<b>DOUBLE VISION</b>	<ul style="list-style-type: none"><li>• Inability to concentrate while reading</li></ul>
<b>SENSITIVITY TO LIGHT AND GLARE</b>	<ul style="list-style-type: none"><li>• Avoiding sun</li><li>• Discomfort with car lights</li></ul>
<b>IMAGE DISTORTION</b>	<ul style="list-style-type: none"><li>• Difficulty in reading</li></ul>

Individuals affected by disease that causes an overall blur generally tend not to complain of peripheral vision difficulties and independent travel abilities.



## 2. Central Field Loss

### CENTRAL FIELD LOSS

Central visual field loss results in the inability for the individual to perceive objects or people in the direct line of sight (Fig 2-3a, b & c).



**Figure 2-3a:**  
Scene as perceived by a normally sighted person



**Figure 2-3b:**  
Central relative scotoma



**Figure 2-3c:**  
Central absolute scotoma  
[photos courtesy of: LV Prasad Eye Institute (LVPEI)]

Ocular conditions resulting in Central Field loss

- Age-related macular degeneration (Fig. 2-4)
- Best's disease
- Stargardt's macular dystrophy
- Macular hole
- Macular coloboma
- Myopic degeneration
- Inflammation - chorioretinitis or macular
- Heredomacular degeneration/Stargardt's disease
- Cystoid macular oedema



**Figure 2-4:**  
Age-related macular degeneration  
Photo courtesy of: LVPEI



## 2. CENTRAL FIELD LOSS (CONT.)

*Table 2-2: Functional implications and behavioural manifestations of central field loss*

FUNCTIONAL IMPLICATIONS	BEHAVIORAL MANIFESTATIONS
<b>PARTIAL PERCEPTIONS OF PEOPLE AND OBJECT THAT COULD BE CAUSED BY SCOTOMAS</b>	<ul style="list-style-type: none"><li>• Not talking directly to people</li><li>• Unusual head position</li><li>• Lack of eye contact</li><li>• Diminishing ability to recognize people in front of them</li></ul>
<b>INABILITY TO DISCRIMINATE FINE DETAILS</b>	<ul style="list-style-type: none"><li>• Difficulty in reading</li></ul>
<b>POOR COLOUR VISION</b>	<ul style="list-style-type: none"><li>• Inability to identify the colour of the object</li><li>• Uncoordinated clothing</li><li>• Difficulty in sorting fruits and vegetables</li><li>• Inability to identify medicines</li><li>• Difficulty in identifying food in plate</li></ul>
<b>IMPAIRED CONTRAST SENSITIVITY</b>	<ul style="list-style-type: none"><li>• Bumping into objects</li><li>• Seeing time on watch difficult</li><li>• Coin identification hard</li><li>• Difficulty in mobility</li><li>• Difficulty in seeing curbs and negotiating stairs</li></ul>
<b>GLARE</b>	<ul style="list-style-type: none"><li>• Avoiding sun</li><li>• Difficulty with car lights</li></ul>



### 3. Peripheral Field Loss

#### PERIPHERAL FIELD LOSS

Peripheral field loss affects the individual's ability to perceive people or objects to the sides. Vision is partially obstructed or non-existent in the affected field. Peripheral field loss can also result in blurred images in the visual field or blind spot (Fig. 2.5 a & b).



**Figure 2-5a:**  
*Scene perceived by a normally sighted person*



**Figure 2-5b:**  
*Scene with peripheral field loss*

Ocular conditions resulting in peripheral field loss

- Retinitis pigmentosa
- Glaucoma (Fig. 2-6)
- Leber's congenital amaurosis
- Optic atrophy
- Intracranial lesions
- Lasered diabetic retinopathy
- Retinopathy of prematurity
- Stroke, brain injury, brain tumour
- Multiple sclerosis
- Retinal detachment

[photos courtesy of: LV Prasad Eye Institute (LVPEI)]



**Figure 2-3c:**  
*Glaucomatous optic atrophy*



### 3. PERIPHERAL FIELD LOSS (CONT.)

*Table 2-1: Functional implications and behavioural manifestations in peripheral field loss*

FUNCTIONAL IMPLICATIONS	BEHAVIORAL MANIFESTATIONS
<b>INABILITY TO PERCEIVE PEOPLE OR OBJECTS OFF TO THE SIDE</b>	<ul style="list-style-type: none"> <li>• Unusual head movements</li> <li>• Difficulty in reading</li> <li>• Uncertainty in mobility</li> <li>• Inability to find lost objects</li> </ul>
<b>PARTIAL BLURRED VISION</b>	<ul style="list-style-type: none"> <li>• Difficulty in reading and writing</li> <li>• Difficulty in recognizing details like facial features and facial expressions</li> <li>• Difficulty in reading road signs</li> <li>• Difficulty in orientation and mobility</li> <li>• Difficulty in driving</li> <li>• Difficulty in grooming</li> <li>• Difficulty in using computers</li> <li>• Difficulty in signing</li> </ul>
<b>SLOW LIGHT AND DARK ADAPTATION</b>	<ul style="list-style-type: none"> <li>• Difficulty in mobility from light to dark or from dark to light</li> </ul>
<b>IMPAIRED CONTRAST SENSITIVITY</b>	<ul style="list-style-type: none"> <li>• Bumping into objects like door frames or furniture</li> <li>• Seeing time on watch difficult</li> <li>• Identifying currency and coins problematic</li> <li>• Difficulty in mobility</li> </ul>
<b>DECREASED NIGHT VISION</b>	<ul style="list-style-type: none"> <li>• Inability to drive at night</li> <li>• Difficulty in finding way in dark places</li> </ul>





## SELECTED READING/REFERENCES

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