



# VISUAL REHABILITATION SERVICES



ARAVIND EYE CARE SYSTEM

# **LOW VISION AIDS IN THE CONTEXT OF VISION 2020**

## **INTRODUCTION**

The Global initiative for elimination of Avoidable Blindness, include low vision as an important cause. The strategies are:

1. To Develop and make available low vision services and optical devices for all those in need, including children in Blind school, or integrated education.
2. To include provision of comprehensive low vision care as an integral part of national programmes for the prevention of Blindness on Rehabilitative services for the visually disabled.

### **Definition:**

By the 'WHO' Definition - " A person with low vision is one who has impairment of visual functioning even after treatment, surgery or standard Refractive correction and has a visual acuity of less than 6/18 to light perception or a visual field of <10° from the point of fixation, in the better eye but who is potentially able to use, vision for the planning and or execution of a task."

### **Low Vision Aids:**

Low vision Aids on a broad classification comprises

1. Optical Aids
2. Non optical Aids

**Optical Devices** consists of:

1. Telescopes.
2. Ashperic lenticular spectacle lenses.
3. Hand magnifier.
4. Stand Magnifier.
5. Fresnel prisms.
6. Prismospheres
7. Paper weight magnifier.
8. Bar magnifier.
9. Pocket magnifier.
10. Electronic Aids as closed circuit Television system.

**Non Optical Devices:**

Includes 7 categories of devices

1. Large print books.
2. Reading stand that supports posture and comport.
3. Illumination devices as fluorescent Lamps and Glare control devices  
as photochromatic glasses.
4. Writing devices as Typoscopes.
5. Medical management devices as insulin syringes with bold letters
6. Mobility canes.

7. Sensory substitution devices as talking books

Ocular conditions benefited by low vision devices are:

1. Albinism.
2. Central serous Retinopathy.
3. High Myopia.
4. Microphthalmos.
5. Diabetic Retinopathy

Ocular conditions where there is not much Benefit from low vision Aids <2/60 and field of vision is <10degrees.

1. Retinitis Pigmentosa
2. Advanced Glaucoma
3. Optic atrophy with field defects
4. Retinal vascular occlusion.
5. Macular Atrophy

<b>Ocular Disorders causing low vision in different age groups</b>	
Children	Retinopathy of prematurity Congenital Cataract Nystagmus Albinism Microphthalmus Lebers optic atrophy
Adult	Retinitis Pigmentosis Heredo Macular degeneration Stargardts Disease Pathological Myopia Optic atrophy Temporal Pallor Retino Choroidal coloboma
Elderly	Age related Macular degeneration Diabetic Retinopathy Advanced Glaucoma

### **Visual rehabilitation by early intervention.**

An early intervention Programme has to be charted out based on the assesment of visual and other sensory skills that are lacking and appropriate training should be given to improve those skills. High myopic error can be corrected with conventional spectacle. And ARC coating. A box made of hollow space where the child is placed and then toys and lights for stimulation are pleaced inside it for visual and tactile stimulation.

This has got a wodden platform over which the baby is placed such the sounds that are produced by tapping are resonated which stimulate the baby. Such a box is called the beactive box which keeps the baby active.early intervention programme of R.O.P. children is particularly a team approach with joint responsibility of ophthalmologists neonatologists rehabilitationists parents for succesful early internvention.

### **TYPES OF MAGNIFICATION**

#### **Relative distance magnification**

If a patient can read 8m print at 16 inches moving the print twice as close will allow reading 4m print. Moving the reading material to 2 inches will allow reading of 1m print.

The accommodation or a near add can be thought of as magnification in the sence that it allows the priciple of relative distance magnification to operate as objects that are held closer and appear larger.

### **Relative size magnification**

The most obvious example is the large print books like readers digest, relative size magnification enlarges the object so that it can be seen better.

In every day life such large sign boards kept in airports , railway stations help people with vision impairment to see better.

### **Angular magnification**

The magnifying lens takes the light rays from the object being viewed and projects them at an increased visual angle to produce an enlarged virtual image of the object on the retina.

### **Projection magnification**

Here the user sees an image of the object that is projected electronically.

The best example is a closed circuit television system or a video eye, which has been recently utilised.

## **MAGNIFYING LENSES USED BY LOW VISION PATIENTS**

### **Image location in Magnifier**

#### **Hand Magnifier**



This is a simple Low vision aid used commonly, to see a magnified image of a text on a object. The patient has to adjust the focus by moving the Hand magnifier up and down to get an optically clear image. The Hand magnifier comes in +6Dioptre and +12Dioptre power.

### **Stand Magnifier**



The stand magnifier comes with a fixed focus and these Low vision aids have the advantage of eliminating the problem of maintaining the focus in Hand magnifier. The patient has to move close to the eyepiece to see a clear image.

### **Aspheric glass**



The Aspheric glasses, eliminates peripheral distortions seen in the spherical glasses of high plus power used in Aphakia. The Aspheric glasses comes with the power of +16 Dioptre and +22 Dioptres. The print material has to be kept very close to the nose to see a clear image. This Aspheric glasses comes as a monocular glass with other eye plano to avoid a convergence strain on patient.

### **The Closed Circuit Television(CCTV)**



The Closed Circuit Television(CCTV) is an electronic Low Vision Device, where a surveillance camera is used to pickup the text and give a magnified image. This cost effective CCTV which amounts to more than 10,000 outside is given at a cost of Rs 3,000 at Aravind as a service to Low vision patients, manufactured by the instruments lab.

### **Binocular telescope**



The Binocular telescope is generally used to see distant objects. The same telescope can be used by Low vision patients for spotting distant objects and to



A collage of various text elements. At the top, a large block of text reads "NCKZO RHSDK DOVHR CZRHS ONHRC DKS NV ZSOKN QKONR BRZEO". Below this, there is a large, bold number "7". To the left of the "7", there is a small inset image of a document with the text "DKSN DZSN DZSN DZSN". To the right of the "7", there is a small inset image of a document with the text "The bee stings. Butterflies taste with their hind feet. Ducks will lay eggs only in the morning. It is impossible to burn and keep one's eye open." At the bottom left, there is a small inset image of a document with the text "DKSN DZSN DZSN DZSN". At the bottom right, there is a small inset image of a document with the text "The bee stings. Butterflies taste with their hind feet. Ducks will lay eggs only in the morning. It is impossible to burn and keep one's eye open."

VISION CONTRAST TEST SYSTEM

1 2 3 4 5 6 7 8 9

A

B

C

D

E

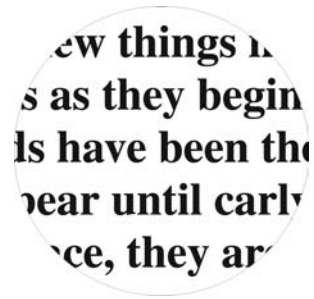
LEFT RIGHT UP DOWN

VISION CONCEPTS LIMITED, INC.  
A DIVISION OF  
A LAMARCA COMPANY

## Normal Vision



Distant Vision



Near Vision

The following photographs show how a person with low vision perceives vision in different disease conditions.

### Vision of a patient with Macular Degeneration having a shadow in the central vision



Distant Vision



Near Vision

### Vision of a patient with Diabetic Retinopathy



Distant Vision



Near Vision

### Vision of a Glaucoma patient with constricted field

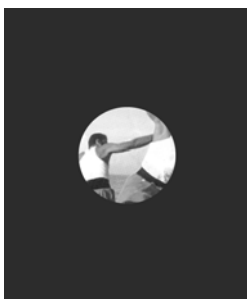


Distant vision



Near Vision

Vision of a patient with Retinitis Pigmentosa showing Tubular vision.

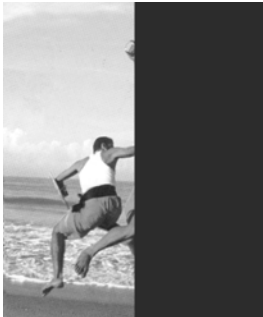


Distant Vision



Near Vision

**Hemianopia, where the eye sees only one half of what is in view**

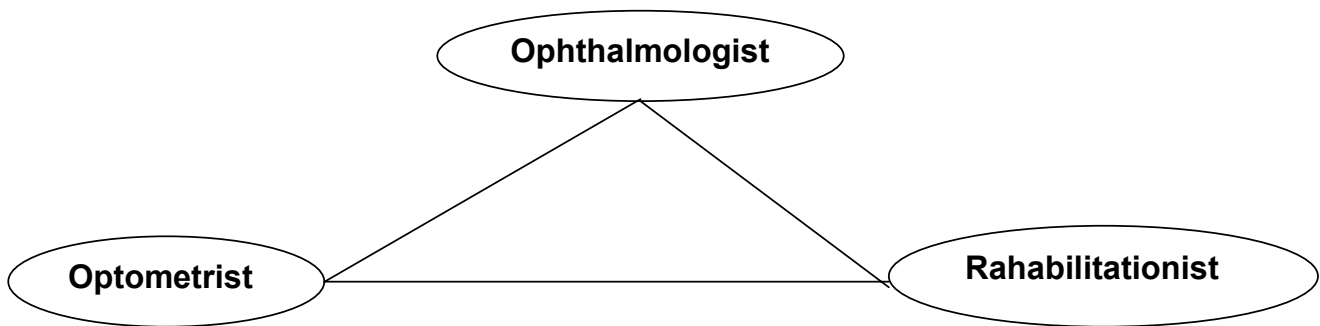


**Distant Vision**



**Near Vision**

### **TEAM WORK**

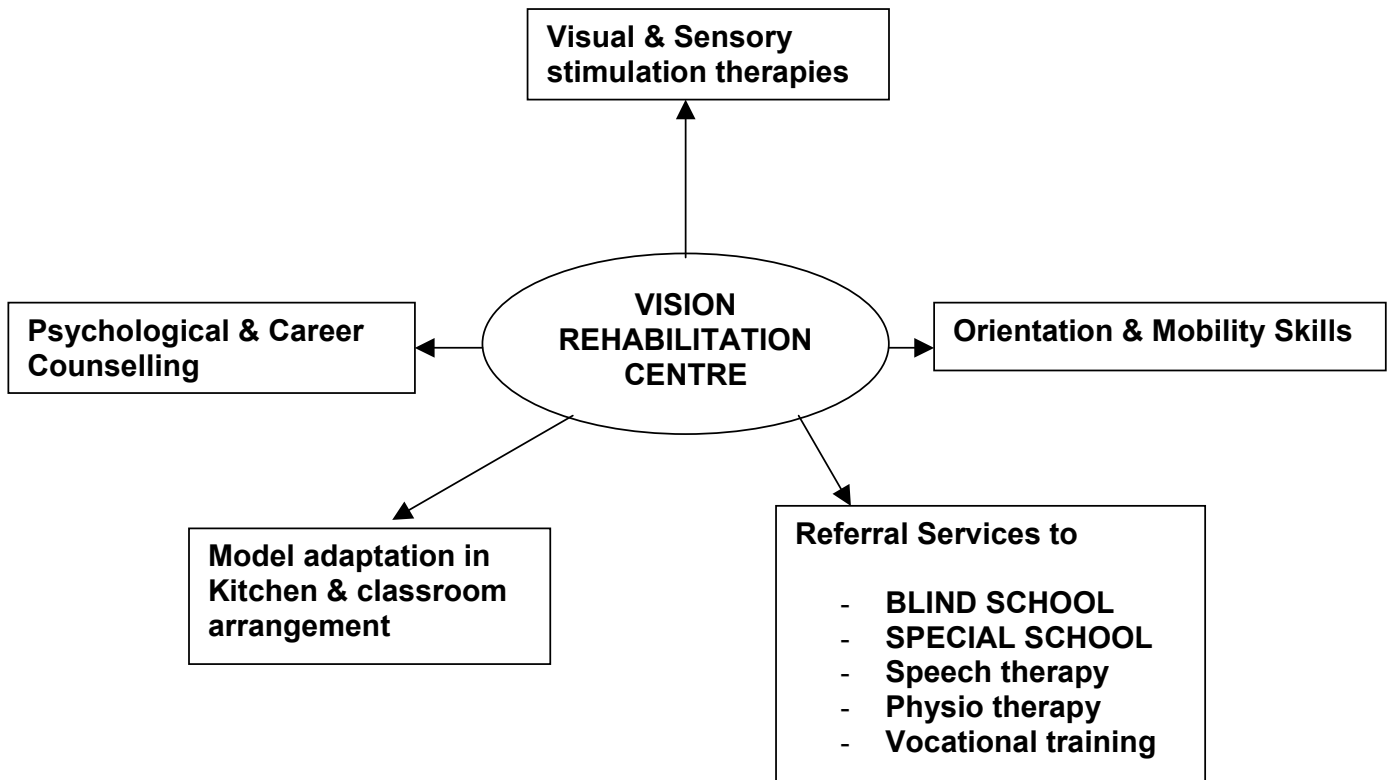


The rehabilitation of a low vision patient is a joint responsibility involving the ophthalmologist, optometrist and a rehabilitationist

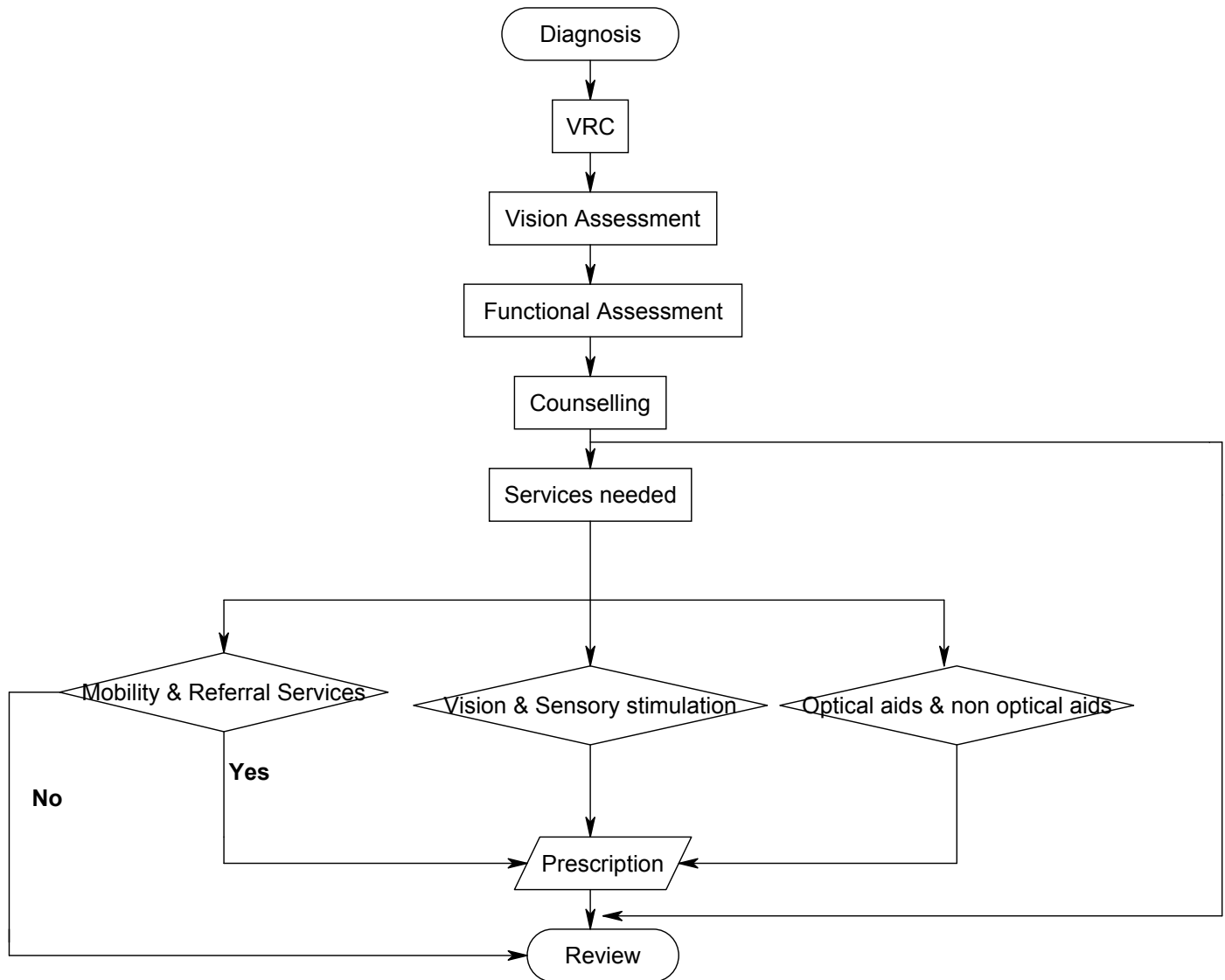
- **Ophthalmologist** involves in the clinical evaluation of the patient, determines the types of low vision aid most appropriate for the patient based on the diagnosis and prognosis and future medical and surgical intervention for the patient.
- **Optometrist** does the optometric low vision assessment, retinoscopy, best refractive correction and involved in the dispensing of the low vision aid.

- **Rehabilitationist** conducts functional vision assessment, giving psychological counselling, Career guidance, independence in daily living activities, and teaches orientation and mobility skills.

### REHABILITATION SERVICES



**VISION REHABILITATION CENTRE (VRC) FUNCTIONS:**



## CONCLUSION

Low vision management has to be individualised according to the patients needs and has to be tailormade depending on various factors as age, profession, and patients stated needs

Though the managment of some the disease is specific more importance is given to the patients stated needs.

The approach to a low vision patient should be holistic so that the ultimate aim of low vision service will be to help the patient to achieve self-confidence and rehabilitation in his social and professional life.

## SUGGESTED READINGS

- 1.Advanced low vision optics William. b.mattingly, MA,ABOM  
Journal of ophthalmic nursing and technology.
- 2.Silverstone, Barbara, ed.  
Lighthouse Handbook on Vision Impairment and Vision Rehabilitation  
- Vol. 1 Vision Impairment/ Oxford: Oxford University Press, 2000.
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- Vol 2, Brilliant, Richard L
4. Essentials of Low Vision Practice/ Boston: Butter worth-Heinemann, 1999.

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