



**LOW VISION**  
SPECIALISTS



# YOUR LOW VISION GUIDE



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# WHAT IS LOW VISION?

Low vision is a condition in which the visual acuity or visual field is decreased to the point where glasses, contacts, or medical treatments cannot correct it to the level for which people can still do normal daily activities.

There is no hard rule for what actually qualifies as low vision. As stated above if a person has an inability to see well enough to do daily activities it could be considered low vision. So a person that has 20/20 acuity but has poor contrast sensitivity which makes it difficult to read could be what is considered low vision. Whereas a person with 20/30 acuity and has no issues in daily life is not considered low vision visual acuity. When we define blindness and low vision the two are quite different. Although those that are legally blind most likely have low vision the opposite is not always the case. To be legally blind means that your better seeing eye is only capable of being corrected with glasses or contacts to 20/200. What this means is that the visually impaired person has to be at a minimum of 20 feet away to see an object that a normal seeing person can be 200 feet away from. Another limitation may be the visual field, it is also considered legal blindness if the field of view is only 20 degrees. A normal seeing person has at least a 140 degrees of visual field.

Oftentimes a person may have vision loss that is substantial in one eye from diseases such as macular degeneration. So the central vision may be partially or even completely gone in that eye. However if the other eye still functions normally and the patient can still see the things needed for normal daily activities then that person does not have what is low vision. Most of the time the brain will filter out the blur from the bad eye and use the input from the better eye. Unfortunately for some that isn't always the case. In some cases the vision may just be blurred and it is combined with the clear vision of the other eye. This is a summation effect which causes the overall vision to be decreased and may end up being considered what is low vision.



# TYPES OF LOW VISION?

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## CENTRAL VISION LOSS

Central vision loss is usually the result of damage to the macula. The macula is the area of the retina where the photoreceptors are the most densely packed. Similar to pixels on a TV, the more dense the photoreceptors or pixels the better the image or picture is. Our central vision is what allows us to see detail for such tasks as reading and writing, seeing street signs and recognizing faces. Central vision loss can be devastating to one's ability to function and do daily activities. Losing the ability to drive and read can lead to isolation and to depression. Although our central vision only makes up about 3 percent of our overall vision it is the most important part of our vision for maintaining our independence.

## PERIPHERAL VISION LOSS

Peripheral vision loss affects our side vision and is considered everything outside of the central 10 degrees of vision. Severe peripheral vision loss can be called tunnel vision. Tunnel vision affects our mobility and orientation and can greatly slow or hinder our productivity. If the peripheral vision loss is bad enough it will limit the ability to drive and play sports because of the inability to see things coming at you from the sides.

## LOW VISION SYMPTOMS

Symptoms of low vision can vary greatly. Because Low Vision is more of a term in regards to function, symptoms can be anything that decreases visual function and makes daily activities more difficult.

Blurred central vision is probably the most common symptom. However decreased peripheral vision isn't far behind.

Night blindness, light sensitivity, glare and even phantom vision can be common symptoms of different types of blindness and low vision.

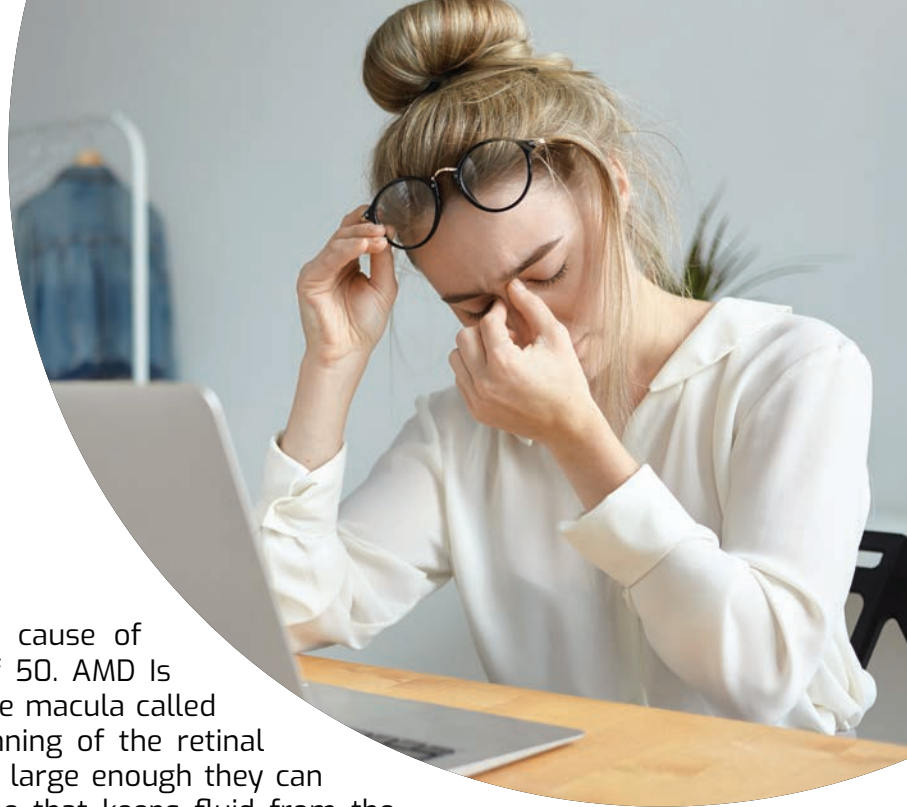
Decreased contrast sensitivity and or some loss of color perception.

Confusion when performing visual tasks, trouble reading, double vision, abnormal body posture, balance problems and dizziness.

Phantom vision is also known as Charles Bonnet syndrome. This is where the brain starts to fill in images because the input from the eyes is decreased. The brain fills the void of the scotomas (blind spots) with stored memories or images. Once mental illness such as schizophrenia has been ruled out and there is considerable vision loss the diagnosis of Charles Bonnet Syndrome or Phantom Eye Syndrome can be made.



# CAUSES OF LOW VISION?



## 1 LOW VISION DISEASES

Macular degeneration is the leading cause of vision loss in people over the age of 50. AMD is caused by formation of deposits in the macula called drusen (dry amd). This causes a thinning of the retinal layers or atrophy. If these drusen get large enough they can break through a protective membrane that keeps fluid from the inner layers of the retina, this is when it becomes what is called wet macular degeneration allowing fluid to enter the inner layers. Once this happens those inner layers are starved for oxygen, this triggers new blood vessel formation. These new blood vessels are very tiny and fragile and easily break causing even more leakage.

Diabetic retinopathy is the overall leading cause of blindness and the second leading cause of central vision loss. Diabetic Retinopathy is caused by the blood having too much sugar in it and the sugar not getting into the cells to provide energy. This causes the cells that line the blood vessel walls and control the dilation of the vessels to be damaged and to allow the blood vessels to become leaky. This can also lead to new blood vessel formation which tend to be fragile and easily break causing even more damage.

Glaucoma is also a common cause of low vision in adults. Although it can affect children it is far more common in adults. This disease affects the peripheral vision and deteriorates from the outside in. Glaucoma causes the nerves of the retina to atrophy usually due to intraocular pressure choking off the blood supply to the nerves or from other systemic diseases decreasing the blood supply.

Retinitis Pigmentosa is a genetic condition that can be passed down from generation to generation. It is characterized primarily by peripheral vision loss and night blindness. It affects the rods of the peripheral retina which are responsible for movement and vision in low light levels. Most lose their vision slowly and don't become completely blind. An even more rare form is called Inverse RP and affects the central vision.

Amblyopia and Strabismus are two common causes of low vision in children. These two conditions tend to go hand in hand as strabismus causes amblyopia, however there many other causes of amblyopia. Strabismus is a misalignment of the eyes or an eye turn. Amblyopia is caused when the brain suppresses the input from the turned eye so that you don't see double. The suppression causes the brain cells that would normally be stimulated to atrophy due to lack of use. This is called amblyopia. The longer the eye is suppressed the worse the vision loss will become. Amblyopia can be somewhat reversed if the underlying condition is fixed, and vision therapy is used.

Acquired (traumatic) brain Injury can be a cause of low vision if the injury is along the visual pathway. Strokes can cause many forms of vision loss and low vision but often result in hemianopsia which is a peripheral visual field loss of usually half the field of vision.

Stargardt's Disease is a form of macular degeneration and is a cause of low vision in children and young adults. It is a genetic disorder that is passed down from parents to their children. It is often referred to as juvenile macular degeneration. In this disease photoreceptors in the macula die off causing loss of central vision and color vision deficiencies.

Cataracts develop into several different types but the worst for central vision loss are posterior polar cataracts which are an opacity in the center of the lens of the eye. Nuclear cataracts cause a loss of contrast sensitivity, overall hazy vision and can contribute to night blindness.

## 2 LOW VISION DIAGNOSIS

Low vision tests are done at an eye exam with an optometrist or an ophthalmologist to determine the functional vision of a patient and their ability to perform daily activities. Visual acuity and amsler grids are low vision test charts used to determine central visual function or loss. Visual field tests aid in the low vision diagnosis to determine the field loss and remaining functional ability. A low vision diagnosis may also be made from an occupational therapist when they are conducting their in-home low vision assessment test.

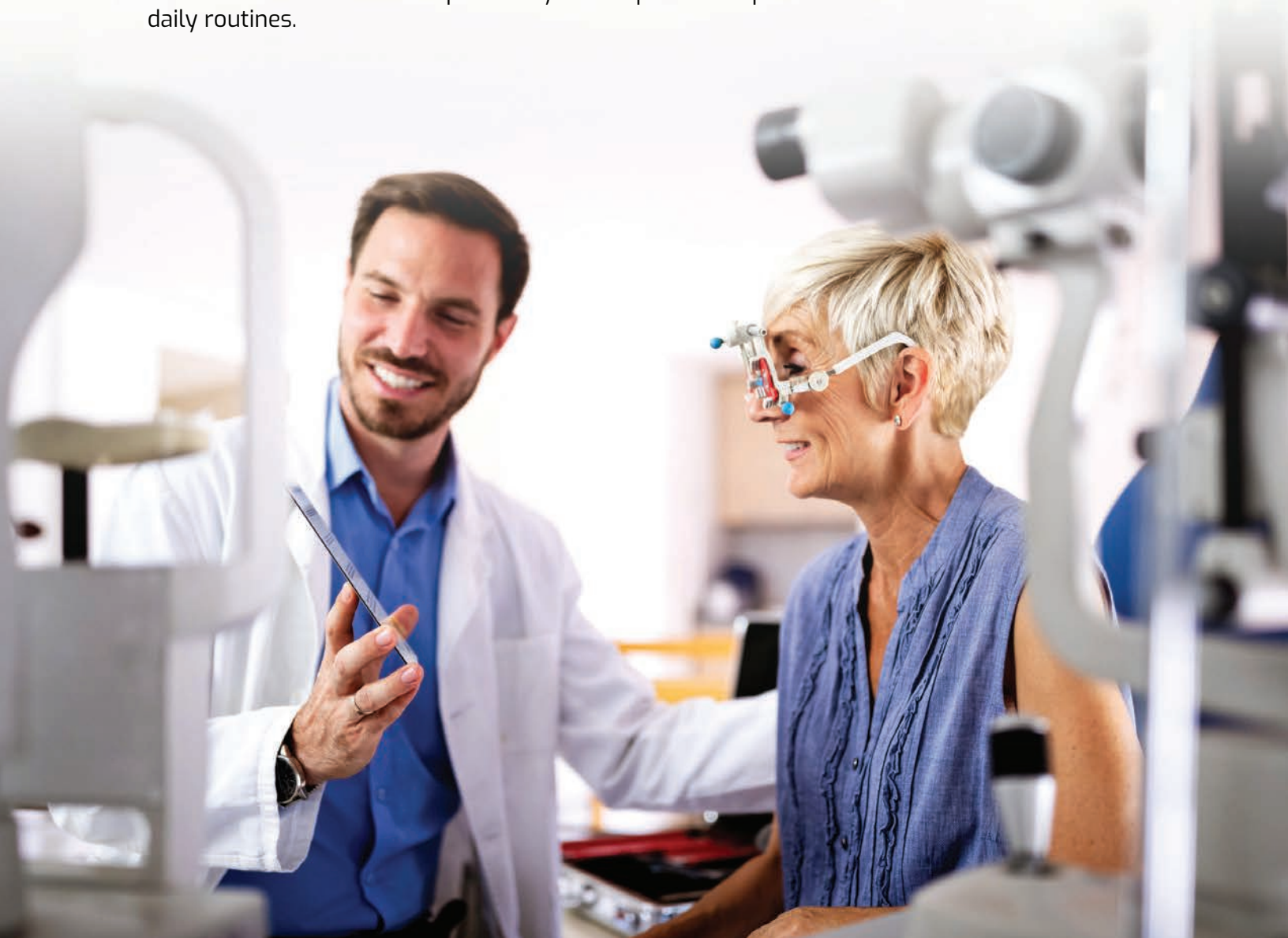


# LOW VISION REHABILITATION OR TREATMENT

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## LOW VISION THERAPY

Low vision therapy is done by optometrists specializing in low vision and by occupational therapists who also specialize in low vision occupational therapy. Low vision therapy consists of teaching the patient how to use computer aided low vision devices and techniques. Low vision devices such as telescopes require special care and skills to be able to use them effectively. Low vision techniques such as eccentric viewing can greatly improve the patient's ability to determine objects and faces. Low vision occupational therapy usually involves teaching the patient how to function in their own environment in a safe manner. Activities such as cooking can be dangerous if the patient doesn't have the skills and special low vision devices and techniques to fall back on. Occupational therapists are a great resource for low vision activities for children once they have been fit with their low vision devices. They can teach them low vision compensatory techniques to help them with their schoolwork and daily routines.





# FREQUENTLY ASKED QUESTIONS

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## **Q I have low vision. Does it mean I will go blind?**

→ While some eye diseases can cause total loss of sight, most, such as macular degeneration, generally do not. Some individuals may be considered legally blind when corrective vision reaches 20/200 or worse, or their field of vision is restricted to a 20-degree diameter, but even then, they often have a lot of available vision that can be used with proper management and vision enhancement with low vision devices.

## **Q Will I be totally dependent on others?**

→ Not at all. With the help of vision rehabilitation, you can learn to adapt to the vision changes that your eye condition causes (such as loss of central vision) and continue to see and live a very full, active and independent life.

## **Q Will I always have low vision?**

→ Some causes of low vision such as cataracts are very treatable and good vision can be restored. When caught early, other conditions like wet macular degeneration and glaucoma can be stopped or slowed although damage already done is not reversible.

## **Q Will treatment for my low vision be covered by insurance?**

→ Fortunately, many aspects of vision rehabilitation are now covered by Medicare as well as some private insurance companies. With that said, many of the adaptive devices you might require to increase your personal freedom are not currently covered. Consult with your Vision Rehabilitation Specialist to determine what kind of low vision products and systems would be best for you. Listed in this Guide are some vision support organizations that may provide assistance at little or no cost.

## **Q Am I visually Impaired, Legally blind, or Blind?**

→ Visual impairment does not necessarily mean blindness, as its severity occurs along a wide spectrum. The World Health Organization (WHO) uses the following classifications:

- **20/20:** Normal vision
- **20/30 to 20/60:** mild vision loss, or near-normal vision
- **20/70 to 20/160:** moderate visual impairment/low vision
- **20/200** or no better than 20 degrees visual field in both eyes with correction: legal blindness, qualifying for government benefits
- **20/400:** severe visual impairment/low vision
- **20/500 to 20/1,000:** profound visual impairment/low vision
- **More than 20/1,000:** near-total visual impairment or blindness
- **No light perception:** total blindness

# WHAT CAN YOU DO?

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## SELF-MONITOR

You should plan to visit your eye doctor at least once a year. Both of your eyes are usually affected, which is the normal course of the disease over time. Unequal vision can cause problems at first with depth perception (stereopsis), but you are probably adapting to that. You should self-monitor your vision in between visits by using an Amsler Grid. Below is a printable version.

### AMSLER GRID

Recording your progress is only one reason to self-monitor and visit your doctor regularly. You also need to be checked for complications, one of the most serious being potential progression to the wet (neovascular) form of the disease. Wet AMD can destroy central vision in a matter of months if left untreated. Signs to look for are sudden and persistent blurriness, distortion, and/or dark or blind spots.

Also, it is not unusual to develop eye conditions in tandem with macular degeneration, such as cataracts or glaucoma. Be sure to check one eye at a time, and if changes occur, contact your doctor for diagnosis and treatment as early as possible.



## WEAR CORRECTIVE LENSES

Glasses and contact lenses will be able to correct acuity up to a point, but they will not restore lost vision. If the time comes that corrective lenses have done all they can, technology and other senses can substitute quite well for the loss of detail vision.







## TAKE CARE OF YOUR EYES

There is yet no way to actually prevent AMD, but studies have shown that environmental, behavioral, and dietary factors are thought to contribute to the progress of the disease. Here are common recommendations for good eye health:

- Eat a diet rich in leafy green vegetables.
- Take daily doses of antioxidants and zinc, as recommended by the Age-Related Eye Disease Study (AREDS).
- Maintain your recommended body mass index (BMI).
- Avoid smoking tobacco
- Exercise
- Avoid excessively bright sunlight by wearing a wide-brimmed hat and wrap-around sunglasses that are protective against both ultraviolet (UV) rays and blue (or “near-UV”) light.
- Contact a low vision specialist if your vision worsens.
- Control your blood pressure.
- Be careful



## RECOGNIZING CHANGES

If you are experiencing any changes in your vision it's important that you go to an eye care professional immediately. Notice if you're having trouble performing tasks that require you to see up close, or are having difficulty picking out colors, seeing signs, or doing work in light that used to be sufficient. These may be early signs of eye disease. Many eye conditions, if caught early enough, can be controlled and damage limited, therefore an annual eye exam is essential.

If you have experienced vision loss due to eye disease, your doctor will probably refer you to a low vision specialist. This dedicated eye care professional will be able to evaluate your available vision and refer you to other specialists who can assist with rehabilitation and resources.



## LIVING WITH LOW VISION

Most of all, realize that you are not alone. Millions of Americans experience low vision and there are many organizations, professionals, and resources (some listed in this Guide) available to you. You will also find many ways to make daily life easier to navigate. You'll find that your state has at least one library offering Talking Books and large print publications. Many banks offer large-print checks. Services, like the utility or phone companies, may offer large-type billing, and you'll find large-print newspapers, reading services, or special TV video services for people with low vision. There are also many discounts and exemptions offered for people who are legally blind such as those from the IRS, the Post Office, and many public transit systems. As you work with your low vision eye care professional and Vision Rehabilitation Specialist, you'll learn many more tips for enhancing your daily life.



### READING AND WRITING

Loss of the ability to read and write easily is one of the most disturbing aspects of vision loss. If AMD affects both eyes, nothing can make a person's vision clearer. If, however, print is too difficult to see, sometimes magnification, better lighting, and higher contrast help. These adaptations can be enhanced with training and practice in eccentric (off-center) viewing under the guidance of a **low vision therapist**

## DRIVING

You may someday need to think about giving up driving.

The reasons most drivers give for continuing to drive (in order of importance) are:

Convenience Independence Comfort Privacy

Pride of ownership

You are the best judge of when driving is no longer safe. Don't wait until you have an accident. Here are some signals that might mean driving is not for you:

- You are nervous behind the wheel.
- You feel that you react too slowly due to your vision.
- You have trouble reading street signs.
- You have had a near mishap because you didn't see a pedestrian, an object, or another vehicle.
- You get lost easily.
- Oncoming lights temporarily blind you.
- The sun hurts your eyes, but dark lenses make it difficult to see.
- You find it abnormally difficult to see at dusk or dawn.
- Your color perception is diminished.
- People whom you trust recommend it. (Sometimes they notice things you don't.)

A BiOptic telescope is for periodic use when close-up spotting is necessary, such as reading a street sign. It is not intended for continuous viewing, and it takes practice to use efficiently. You May need to check with your states DMV for driving requirements with Bioptics.



## ADAPTATION

You will want to adapt your living environment in order to maintain your normal life. This may mean:

- Adapting your environment for safety and navigation
- Improving the lighting
- Learning new ways to prepare meals
- Learning tricks to make personal grooming easier
- Using magnifiers for easier reading
- Using new technology for reading and writing
- Labeling medications, clothing, and appliances
- Learning new ways to keep financial records

You will find the **Self Help Guide To Non-Visual Skills** full of ideas about how to accomplish all of these and other daily living activities. As your vision continues to worsen,





## LOW VISION DEVICES

You may find certain optical devices handy, such as:

- Prescription magnification glasses
- A small telescope for reading street signs, identifying people, and seeing the sights
- Computer software that magnifies your monitor screen and cursor
- Magnification devices for your desktop and pocket

And here are some easily-available non-optical products for people with low vision:

- Bold tipped pens
- Large print books and magazines talking books
- Check writing guides
- Talking watches, clocks and scales lighting instruments
- Book holders
- Talking prescription bottles

The past few years have seen the development of many high technology devices, namely:

- Audio book players
- Desktop electronic magnifiers
- Portable electronic magnifiers
- Global positioning systems (GPS)
- Personal digital assistants (PDAs)
- Optical character recognition (OCR) software reading machines
- Computer screen magnification
- Computer screen and text-to-speech readers
- Speech recognition software (speech-to-text)
- Braille machines and other tactile devices
- Smart phones and mobile accessibility devices



## LOW VISION REHABILITATION

The best way to learn about and acquire the low vision devices and products best suited to you is to contact a low vision specialist or contact your state's low vision rehabilitation agency. **Click here to find one near you.**

At the very center of an active and independent life with low vision is vision rehabilitation. Fortunately, the U.S. government has recognized the importance of such rehabilitation to a growing percentage of the population and Medicare now covers many aspects of vision rehabilitation. Vision rehabilitation is usually provided by a Vision Rehabilitation Specialist in conjunction with your eye care professional who is a specialist in low vision. The main steps of the rehabilitation are:

- Identification of the low vision condition and underlying disorder
- An analysis of your current refraction, meaning what strength glasses do you require and what, if any, special filters or other additions should be used with the glasses.
- Analysis and tracking of the exact position of your scotoma (i.e., the areas of vision that are blurred or missing). This analysis will help determine your Preferred Retina Location or PRL which is the area of vision from which you see best.
- Training in eccentric viewing which teaches you to see “around” the areas of vision that are damaged. This will involve a series of training sessions with your Vision Rehabilitation Specialist using special teaching tools and cards.





## SUPPORT RESOURCES

The list of support organizations and companies that concern themselves with some aspect of low vision is vast—far greater than we have space for in this Guide. But included below are a few of the principal resources that will be of use to you. Each of these will probably lead you to many more.

### CONSUMER RESOURCES

American Council of the Blind Toll-Free: 800-424-8666, Direct: 202-467-5081, [www.acb.org](http://www.acb.org) A national organization providing programs, services, and resources for blind and visually impaired people.

American Foundation for the Blind Toll-Free: 800-AFB-LINE (800-232-5463), Direct: 212-502-7600, [www.afb.org](http://www.afb.org) A national non-profit organization providing information and resources for people who are blind or visually impaired.

American Macular Degeneration Foundation Toll-Free: 888-MACULAR (888-622-8527), [www.amdf.org](http://www.amdf.org) A non-profit organization providing public education and resources specifically relating to macular degeneration.

Association of Blind Citizens Assistive Technology Tel: 781-961-1023, [www.blindcitizens.org](http://www.blindcitizens.org) The Assistive Technology Fund (ATF) provides funds to pay for 50% of the MSRP of adaptive devices or software for qualifying individuals.

Audio-Reader Radio and Audio Service for Blind and Print-Disabled Persons Tel: 785-864-4600, [www.reader.ku.edu](http://www.reader.ku.edu) Radio and reading service from the University of Kansas for people within their listening area.

Enhanced Vision Toll-Free: 888-811-3161, [www.enhancedvision.com](http://www.enhancedvision.com) Portable and desktop electronic magnifiers.

Foundation Fighting Blindness Toll-Free: 800-683-5555, [www.blindness.org](http://www.blindness.org) Wide range of information and references on all types of retinal disorders.

Freedom Scientific Toll-Free: 800-444-4443, [www.freedomscientific.com](http://www.freedomscientific.com) Portable/desktop electronic magnifiers and low vision software.

The Gavin Herbert Eye Institute - Macular Degeneration Partnership Tel: 949-824-9771, [www.ucirvineamd.org](http://www.ucirvineamd.org) Offering a wide range of information and resources for anyone affected by age-related macular degeneration (AMD).

Lighthouse Guild Toll-Free: 800-284-4422, [www.lighthouseguild.org](http://www.lighthouseguild.org) Lighthouse International fights vision loss through prevention and intervention.

Lions Clubs Tel: 630-571-5466, [www.lionsclubs.org](http://www.lionsclubs.org) Go to website to find phone numbers for clubs near you and to learn more about Lions Clubs Vision Programs.

National Eye Institute Tel: 301-496-5248, [www.nei.nih.gov](http://www.nei.nih.gov) An organization supporting vision research and education programs that protect and prolong vision.

National Federation of the Blind Tel: 410-659-9314, [www.nfb.org](http://www.nfb.org) An organization providing programs, services, and resources for the blind community.

Optelec Toll-Free: 800-444-4443, [us.optelec.com](http://us.optelec.com) Portable/desktop electronic magnifiers, optical devices, and daily living aids.

Veterans Administration Toll-Free: 800-827-1000 VA Health Resource Center: 877-222-8387 Blind Rehabilitation Service Program: 202-461-7317 Website for the location of your nearest VA office and information on low vision services: [www.va.gov](http://www.va.gov)

### PROFESSIONAL RESOURCES

American Academy of Ophthalmology (AAO) Tel: 415-561-8500, [www.aao.org](http://www.aao.org) Research, medical information, and assistance in finding a physician.

American Academy of Optometry (AAO) Tel: 321-710-3937, [www.aaopt.org](http://www.aaopt.org) Wide range of information, advice and resource links.

American Optometric Association Toll-Free: 800-365-2219, [www.aoa.org](http://www.aoa.org) Research and clinical information.