What Is Low Vision?

Defining Low Vision
Low vision may be defined as the loss of clear eye sight that is unable to be corrected with the use of regular prescription glasses, contact lenses, or through vision correcting surgery.

Low Vision Overview
Affecting approximately 135 million individuals worldwide, there are many conditions (such as disease, genetics, injury, and age) that may cause low vision. Some of the more common conditions resulting in low vision are diabetic retinopathy, glaucoma, macular degeneration, and cataracts.

Age may also be a contributing factor of low vision, but it is important to understand there is a natural loss of vision as the eye ages, and proteins degenerate, which does not always result in low vision. Remember, low vision cannot be corrected through the use of regular prescription lenses. Low vision requires the assistance of stronger magnification devices to aid in daily visual tasks. Diseases and injuries causing low vision may require immediate attention by an eye care specialist. It may not be possible to restore lost vision, however protecting the remaining vision may be achieved by early detection and treatment. In other cases involving low vision, the loss of vision may be

Summary of Eye Disease Prevalence Data
Prevalence of Cataract, Age-Related Macular Degeneration, and Open-Angle Glaucoma Among Adults 40 Years and Older in the United States.

more gradual occurring over an extended period of time. Should changes in vision become evident, consulting an eye care professional is advised. These changes may present a variety of symptoms such as difficulty recognizing familiar faces, dimming of vision even when ample light is available, blurred or spotty vision, waves in lines, and difficulty matching colors or perceiving shadows and depths. An annual comprehensive eye exam is recommended for individuals with low vision caused by disease. In some instances, such as the presence of other medical conditions, an eye care specialist may require more regularly scheduled examinations. As the information available regarding low vision increases, the ability to treat, rehabilitate, and successfully utilize remaining vision becomes a more common success story. Treating and rehabilitating an individual with low vision helps to restore an important quality of life. If a person is legally blind, it does not necessarily mean that they have complete vision loss. Only about 10% of the 1.3 million Americans who are legally blind actually have complete loss of vision. A person with perfect vision has 20/20 vision, meaning the individual is able to clearly identify a row of 9mm letters at a distance of 20 feet away. A person determined legally blind has 20/200 vision, meaning the individual needs to be standing at a distance of 20 feet to see what others standing at a distance of 200 feet can clearly see. In other words, a person who is legally blind needs to be standing 2 feet away to see what individuals with normal vision can see at a distance of 20 feet.

Low vision may not necessarily imply the title legally blind, as low vision is often the sight ranging between 20/70 and 20/200. Consequently, the two are not to be assumed as the same; as it is possible to have low vision without being declared legally blind, and being legally blind is not to be defined as a ‘total loss of vision.’ There is a huge array of resources, strategies and products available to help people with low vision live active, full and independent lives.

Low Vision Conditions — Patient Information Guide To Low Vision

Low Vision Conditions

Low vision may be caused by a wide range of eye disorders and conditions. Some of these include:

Age-Related Macular Degeneration

The leading cause of vision loss for older adults in America, Age-Related Macular Degeneration is an eye disease that causes loss of central ‘straight-ahead’ vision due to the compromise of the light sensitive tissue (macula), located in the back of the eye.

Overview: Presented in two forms, Dry AMD and Wet AMD, macular degeneration is the breaking down of the light sensitive cells and tissues located in the back of the eye. The area affected is known as the macula. Located in the retina, the macula is responsible for converting light and images into electrical signals that are carried through to the brain. As AMD advances the loss of central ‘straight-ahead’ vision occurs and images become less sharp and blurred. It is possible for only one eye to be affected by AMD, but it is more common for both eyes to experience the effects.

Dry AMD results in a more gradual loss of vision, whereas Wet AMD (also called Advanced AMD) results in a rapid loss of vision caused by the disease.

This is What it Can Mean to be Blind or Visually Impaired

Macular Degeneration
Diabetic Retinopathy
Glaucoma
Cataract
Blindness
Dry AMD occurs in 3 stages:

**Early AMD** – Often there are no symptoms during this stage, only minor developments of small drusen (small yellowish deposits under the retina). The early stage of Dry AMD is generally only detectible through a comprehensive dilated eye exam.

**Intermediate AMD** – As the second stage develops, signs of AMD may occur. Additional lighting may become necessary when reading or performing daily tasks. As the presence of drusen behind the retina increases, the loss of sharp detailed vision and blurring may begin.

**Advanced Dry AMD** – In this stage of AMD, the amount of drusen has increased. Light sensitive tissues have been broken down, and central vision is often replaced by a darkened spot or ‘missing vision.’ It is possible for this spot of missing vision to darken and increase over time.

**Wet AMD** – Less common than Dry AMD, Wet AMD is also known as Advanced AMD. The loss of vision due to wet AMD is rapid, as abnormal blood vessels form behind the eye. These newly formed blood vessels are weak, fragile, and may leak fluid, causing the macula to rise or shift in position inside the eye, resulting in severe vision damage.

**AMD Symptoms:**
- Blurred Vision
- Less clear ‘straight-ahead’ vision
- Difficulty recognizing faces
- Blurred vision decreases with increased lighting
- Small blind spots (these blinds spots do grow) in central field of vision
- Straight line appearing wavy (Note: This is a serious symptom, potentially a medical emergency, and should be treated as such).

**AMD Treatments:**
There is presently no known cure for AMD. However, there are treatment options available that may assist in slowing the advancement and possibly suspend the progression of AMD. Among the medical procedures available to treat AMD, studies have found there are benefits when a high dose antioxidant formula rich in zinc is used. Each treatment option (including a high-dose antioxidant and zinc formula) should be carefully considered with the assistance of your specialist.

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**Procedures for Treating AMD:**

**Laser Surgery** – As the formation of abnormal, weak, and fragile blood vessels from behind the retina, laser eye surgery focuses on destroying the leaky blood vessels through the use of a high power light energy beam. The abnormal blood vessels are targeted and destroyed, possibly preventing any further loss of vision. Though it is not possible to restore sight that has been lost due to AMD, preventing further loss may be accomplished through the proper treatments. Laser treatment is most successful when the fragile, abnormal blood vessels are further away from the central part of the macula, as the laser treatment may not be optimal for destroying blood vessels that are closer to the center of the light sensitive tissue. More than one treatment may be required and complete prevention of newly developing abnormal blood vessels is not guaranteed.

**Photodynamic Therapy** – Using an injection into the arm, a drug called verteporfin swiftly travels through the body, reaching the tiny, newly formed blood vessels in the eye. The verteporfin is designed to “stick” to the surface of new blood vessels allowing for the specialist to shine a light into the eye that will activate the drug. Once the verteporfin is activated, it begins to destroy the newly formed blood vessels, leading to a slower decline of vision loss. This treatment option allows for the surrounding tissues to be preserved as it only targets and affects the newly formed blood vessels. The effects of the verteporfin require a 5-day restriction of avoiding bright light and sunlight until the drug has completely exited the system. Photodynamic therapy may not entirely prevent the development of abnormal blood vessels, but it is able to slow the advances of AMD.
Injections — Developed to treat Wet AMD, a specialized formula is injected into the eye to block and prevent the development of abnormal blood vessels. Several injections may be required as often as once a month to prevent the growth of the abnormal blood vessels. Your doctor will monitor the success of this procedure to determine if injections are the correct treatment option. Along with blocking and preventing the growth of new abnormal blood vessels, reports found that some individuals experienced an improvement in sight following the treatments.

Caring for AMD:
Along with the treatments, caring for your sight is an important step in maintaining your vision. Undergoing an annually scheduled dilated eye exam is important for individuals with AMD. It is possible your doctor will request more frequent exams depending on the condition of your AMD. If you notice changes in your vision, do not delay; contact your eye care specialist immediately. Make healthy lifestyle decisions, if you smoke, stop. Studies support the negative effects of smoking and AMD. Listen to the instructions given by your specialist and if questions about your AMD arise, ask.

Glaucoma
Referring to a group of combined eye conditions, Glaucoma results in the damage of the optic nerve (responsible for transmitting visual information to the brain). Commonly the damage is rendered due to increased pressure in the eye (also known as IOP or intraocular pressure).

Overview: As one of the main causes for blindness in America, Glaucoma exists in four major types: Open-angle (chronic), Angle-closure (acute), Congenital, and Secondary.

Open-Angle (chronic) Glaucoma — The most common form of glaucoma occurs when eye pressure increasingly develops over time, causing pressure on the optic nerve and retina. Divided into sections of the eye, the front portion (known as the anterior chamber) consists of a clear fluid that flows in and out of the chamber with the purpose of nourishing the nearby tissue. As this fluid leaves the anterior chamber, reaching the open angle of the eye where the cornea and retina meet, the fluid is to pass through a spongy mesh-like filter. If the fluid passes through the mesh-like filter too slowly, the buildup of fluid can cause the pressure in the eye to increase, damaging the optic nerve. The cause of open-angle glaucoma is not known, however it does seemingly display a genetic connection with increased cases in individuals of African descent.

Angle-Closure (acute) Glaucoma — Impacting less than 10% of individuals with Glaucoma, closed-angle glaucoma may onset without any signs or warning. The occurrence of closed-angle glaucoma begins when the clear fluid traveling from the anterior (front) chamber of the eye, is obstructed due to the collapse or interference in the path of travel. Increased pressure in the eye due to closed-angle glaucoma can be tremendously painful and may cause severe damage to the optic nerve. Emergency medical attention and intervention is imperative. Should this type of glaucoma advance it will cause blindness. Vision lost as a result of glaucoma cannot be restored but if it is treated promptly, remaining vision may be preserved

Congenital (Primary) Glaucoma — This type of glaucoma is present at the time of birth and is due to the abnormal development of the outflow fluid channels located in the eye. Commonly the diagnosis for congenital glaucoma occurs at birth or shortly thereafter. Since the outflow fluid channels (trabecular meshwork) are developed abnormally, the fluid pressure in the eye builds resulting in damage to the optic nerve and loss of vision. Early detection and therapy may be able to preserve remaining sight and prevent blindness.
Secondary Glaucoma –
Refers to the type of glaucoma that occurs as a result of a pre-existing ocular disease or injury. Such diseases as uveitis or other systemic diseases may be the instigating condition for secondary glaucoma. Like the effects of open-angle glaucoma, secondary glaucoma occurs when the fluid passing through the meshwork, exiting the anterior chamber of the eye, drains too slowly and increases the intraocular pressure.

Symptoms: The symptoms for glaucoma vary and it is possible for individuals with open-angle glaucoma to experience no symptoms at all, until loss of vision has occurred. Many of these symptoms may come and go.

- Loss of peripheral vision (tunnel vision)
- Severe pain in the eye
- Cloudy vision or decreased vision
- Nausea and vomiting
- Halos around lights
- Feeling of swollen eyes
- Redness of eye
- Enlargement of one or both eyes (more common for congenital glaucoma)
- Light sensitivity

Before treatment can begin, tests are performed to determine if the individual has glaucoma. These tests are conducted by an eye care specialist and generally consist of a comprehensive eye exam, (including the dilation of the pupil), Tonometry test (a test measuring the pressure in the eye), Gonioscopy (using a special lens the doctor is able to check the flow of the fluid out of the anterior chamber), an Optic nerve photograph (imaging taken of the back of the eye), and the slit lamp exam (examining the cornea and tear layer). After appropriate testing has determined the type of glaucoma, treatment options may be established.

Eye Drops and Oral Medications – In the early stages of glaucoma, the most common treatment used to lower the pressure in the eye is eye drops and oral medication. Some of the medication prescribed may reduce the production of fluid, while others assist by allowing the fluid to drain more successfully. These medications need to be taken regularly and used as prescribed.

Laser Surgery (Laser Trabeculopasty) – Performed in a doctor’s office or specialized clinic, this laser procedure targets a high beam light aimed at the lens of the eye, concentrated towards the meshwork. The laser then burns several small holes in the meshwork allowing the fluid to drain more effectively. If the glaucoma is affecting both eyes, only one eye will be treated at a time. Multiple treatments may be necessary to maintain proper flow of fluid.

Conventional Surgery – By surgically removing a small piece of tissue from the eye, a new channel for the fluid to exit the anterior chamber is created. This procedure is approximately 60-80% effective and works best if no previous procedures have been performed. The healing time following trabeculectomy is several weeks and is only preformed one eye at a time. It is possible for your vision to be slightly compromised after the procedure.

Caring for Your Eyes – Treatment of glaucoma is a lifestyle choice, as it becomes a part of your everyday life. If medication has been prescribed, follow your doctor’s instructions. Make healthy life choices and create a routine where comprehensive dilated eye exams are preformed so that you can keep abreast of the condition and overall health of your eyes.

If you notice any change in vision or experience pain, seek medical attention. Take note of questions and concerns you have and ask your eye care specialist.

Diabetic Retinopathy
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Overview: Developing in 4 stages, diabetic retinopathy causes changes in the blood vessels of the retina. These changes may, in some cases, cause abnormal new blood vessels to develop, swell, and leak fluid. In other cases of diabetic retinopathy, the abnormal blood vessels develop and grow across the retina.
4 Stages:

Mild Nonproliferative Retinopathy – During this first stage, swelling of the tiny retinal blood vessels occurs. As these vessels swell, they take on a balloon-like appearance.

Moderate Nonproliferative Retinopathy – As the blood vessels continue to swell, the necessary blood supply responsible for nourishing the retina is compromised. This depletes the retina from necessary nutrients.

Severe Nonproliferative Retinopathy – With an increasing number of swollen and blocked blood vessels, the retina begins to suffer from the delayed nourishment due to the inhibited blood supply. As the retina is now in distress, signals are sent to the body to develop new (abnormal) blood vessels.

Proliferative Retinopathy – The final stage of diabetic retinopathy occurs when the retina has conveyed the need for newly formed blood vessels to develop. The body begins creating the abnormal blood vessels, and in the fragile new state of the blood vessels, a clear gel begins to form filling the inside of the eye. The actual formation of these new blood vessels is not the cause of vision loss. It is when the weak blood vessel walls begin to leak fluid, that severe vision loss or blindness occurs.

Symptoms: There are no early stage symptoms for diabetic retinopathy, therefore DO NOT WAIT FOR SYMPTOMS. For individuals living with diabetes, it is recommended to have an annual comprehensive dilated eye exam. Proliferative retinopathy may have the following symptoms:

- Blurred vision
- Specks of blood or spots ‘floating’
- Areas of darkened vision

Treatment: During the first 3 stages of diabetic retinopathy, no treatment may be necessary (unless there is a condition known as macular edema). Stage 4 or Proliferative Retinopathy is treated with what is known as scatter laser treatment. It is optimal to perform scatter laser surgery before the abnormal blood vessels have begun to leak. Placing about 1,000 to 2,000 laser burns into the retina (away from the macula); the blood vessels begin to shrink. Due to the high amount of laser burns required, more than one procedure is often necessary. It is common to experience decreased eyesight and a dimming of color following scatter laser surgery; however the procedure may preserve remaining sight.

Vitrectomy: If there is a tremendous amount of leakage of fluid and blood into the vitreous gel, your doctor may chose to perform a vitrectomy (the removal of the vitreous gel). This is a surgical procedure in which the individual is placed under general anesthesia, a small incision is made in the eye, and the affected gel is removed. Once the gel has been removed, a salt-water solution is replaced in the excavated area. Neither of these treatments cures diabetic retinopathy, but they do help to preserve and protect remaining sight. For individuals with diabetes, general lifestyle choices must be maintained, like controlling blood sugar levels to help slow the onset of diabetic retinopathy. There are also studies that suggest that controlling the elevated levels of blood pressure and cholesterol helps reduce the risk of vision loss.

Cataracts

As the proteins of the eye begin to break down (commonly due to aging) clouding of the eyes lens occurs. This clouding, affecting clear vision is known as a cataract.

Overview: With a handful of classifications for cataracts, the most common is due to the natural aging of the eye. A healthy youthful eye possesses a clear lens much like that of a camera. Over time, as the proteins of the eye break down, the lens begins to fog, creating a cloudy visual effect. The lens
affected by the cataract takes on a milky appearance covering the eye and vision is compromised.

**Types of Cataracts**

**Age related cataract:**
This is the most common form of cataract. More than half of all Americans over the age of 80 will have a cataract or have had cataract surgery. The cataract may develop in one or both eyes, and is mostly attributed to the effects of an aging eye.

**Secondary cataract:**
Not directly caused or onset by age, secondary cataracts develop as a result of an individual’s pre-existing health condition (i.e. diabetes), or as a result of a post-operation eye procedure. Along with pre-existing conditions, studies suggest the use of steroids may also cause secondary cataracts.

**Traumatic cataract:**
Caused by a severe injury to the eye the traumatic cataract may last for several years, clouding the lens of the eye.

**Congenital cataract:**
Developed at birth or during early childhood, congenital cataracts commonly develop in both eyes. These cataracts are often too small to affect the vision. However, if the child’s vision is obstructed treatment may be required.

**Radiation cataract:**
This specific type of cataract is developed as a result to exposure of certain types of radiation.

**Symptoms:**
Though there are many symptoms presented with cataracts, the list below only contains a few of the most common.

- Cloudy or blurred vision
- Compromised ability to see colors
- Haloing effect around bright lights and lamps
- Sunlight appearing ‘too bright’
- Difficulty seeing at night
- Double vision or multiple vision
- Frequent changes in vision, eyeglasses, reading glasses, and contact lenses

Please note, these symptoms are not only associated with cataracts and can also be a result of more serious eye diseases. If you are experiencing these symptoms contact an eye care specialist.

**Treatment:**
Simple treatments for mild cataracts may include the use of prescription glasses, better lighting (increased lighting), the use of a magnifying visual aid, and sunglasses. If the cataract development is more severe, a surgical procedure is commonly preformed to remove the damaged lens. Surgery becomes an option for treatment when daily visual activities are compromised as a result of the clouded lens. With a small incision in the eye, the surgeon removes the affected lens. After the successful removal of the lens, a man made lens replaces the damaged lens. Then small sutures seal the incision, securing the newly placed lens, and the healing process begins. The procedure lasts less than an hour, but if both eyes are affected, your surgeon may perform the surgery on one eye at a time (with a 1 to 2 month interval between the surgeries).

**Retinitis Pigmentosa**

Damaging the retina, retinitis pigmentosa is a disorder caused by various genetic defects. It is an uncommon condition (1 in 4,000 Americans) where the cells controlling the retinal cone and rods are compromised. The result of these visual genetic abnormalities is often loss of peripheral vision (tunnel vision), difficult night vision, and potential blindness.

**Overview:**
Genetic abnormalities compose the disease retinitis pigmentosa, causing the degeneration of the retina, noticeable through the loss of peripheral vision, night vision, and double vision and in some cases, blindness. A molecular disorder, RP directly affects the area of the retina responsible for photoreceptor information (rods and cones). This information is used to communicate the capturing of images to the brain. As the gradual loss of vision occurs, these rods and cones die. Without the use of the rods and cones, the failure to convey information containing color, image, and light results in a loss of eyesight.

**Symptoms:**
RP is a genetic abnormality that is unique to each individual. Additionally, the progression of compromised vision is also based on the inherited molecular structure.

- Loss of peripheral vision (Tunnel Vision): The diminishing ability to see objects located outside of the central area of sight creates
the visual effect of seeing things through a tunnel.

- **Night blindness:** As the rod cells deconstruct, the cells responsible for transmitting information in low lighting situations fail to perform. It is these low light information rod cells that are the first cells to be destroyed.

- **Double vision:** At the onset of tunnel vision, the brain signal communications become confused, making the neurological task aligning sight difficult. The result is double vision.

- **Light sensitivity and glare:** As the rods and cones are destroyed, the eyes become sensitive to light making it possible to experience a “white out” when entering areas of increased lighting (such as when exiting a building on a sunny day).

- **Loss of sharp vision and detailed vision:** The eye may lose its shape and detailed vision along with the ability to align the images being conveyed to the brain and transmit light information.

**Treatment:** Treatment of RP is limited, as vision lost due to retinitis pigmentosa cannot be restored. Maintaining the remaining sight and utilizing vision through the use of visual assistive devices is important. Studies support the benefits of Vitamin A/beta-carotene and antioxidants in relation to retinitis pigmentosa. The positive effects are modest; yet reveal a slowing in the progression leading to loss of vision. Due to the genetic molecular nature of RP, treatment generally focuses on the addition of vitamins, DHA (Omega-3), and Acetazolamide (during the later stages a topical treatment may be used but there are side effects which ought to be considered such as retinal stones, fatigue, anemia, and others). Studies are continually being conducted on the available treatments and procedures relating to RP, consulting your Physician is the most optimal direction for understanding your individual options.

**Stargardt’s Disease**
Stargardt’s disease is the inherited form of macular degeneration in which both parents carry mutations of the genes (ABCA4, CNGB3, ELOVL4, or PROM1) associated with the processing of vitamin A in the eye. This disease begins developing in children and young adults between the ages of 6 and 20, usually damaging both eyes. Once the development begins, rapid loss of central vision occurs.

**Overview:** In 1901, a German ophthalmologist (Karl Stargardt) established that there are many forms of macular degeneration; some are inherited while others are not. The one common factor of the numerous dystrophies is the loss of central vision that occurs as a result of the retina (light sensitive tissue in the back of the eye) deteriorating. As the retina is destroyed, fine, sharp vision is compromised and eventually central vision is lost. In relation to Stargardt’s disease, the early loss of vision often begins during the ages of 6 and 20. The progressive loss of vision commonly leads to blindness. There is no present cure for Stargardt’s disease; however there are tools available to help increase the use of peripheral vision for daily visual tasks.

**Symptoms:**
- Blurred vision
- Compromised vision in low lighting situations
- Difficulty recognizing faces
- Diminished visual appearance of color

**Treatment:** Although there is no known cure for Stargardt’s disease, research suggests lowering the exposure to brightly lighted areas may slow the progression of damage to the retina. Your eye care specialist may suggest the use of eyeglasses and sunglasses to help minimize the eyes’ exposure to light. Additional corrective lenses may be recommended to prevent wavelengths of light from being transmitted to the eye.

**Albinism**
The congenital disorder in which the individual possesses a partial or complete absence of pigment in the hair, skin, and eyes due to the absence or abnormality of an enzyme that produces melanin.

**Overview:** For the 1 in 17,000 Americans today living with some form of albinism, the various types can be broken down into 4 primary groups: OCA1, OCA2, OCA3, and OCA4. In many cases, the individual may be determined ‘legally blind’.

Above: A slit lamp, with its high magnification, allows the eye care professional to examine the front of the patient’s eye.

*credit: National Eye Institute, National Institutes of Health*
Symptoms: The vision challenges that may result due to albinism develop from the lack of pigment. Common disorders experienced are:

- **Nystagmus**: The regular back and forth movement of the eyes
- **Strabismus**: Muscular imbalance, such as “crossed eyes” or “lazy eye”
- **Photophobia**: Bright light and glare sensitivity
- **Far or Nearsightedness**: The ability to see either distance or near with clarity, but not both, without corrective lenses or visual aid assistance.

**Astigmatism**: An irregular toric or curvature of the lens or cornea.

**Foveal hypoplasia**: The improper development of the retina either before birth or during infancy.

**Optic nerve misrouting**: The optic nerve is collecting visual information but is unable to transmit the information to the brain following the normal nerve paths.

**Discoloration of the iris**: Generally the colored center of the eye, the iris, may have little or no pigment to shield out additional lighting attempting to reach the eye.

**Treatment**: Depending on the condition, there may be surgical procedures (correcting strabismus), which can improve the appearance of the eyes. As the retina is extremely sensitive to light, the use of tinted indoor and outdoor glasses may help prevent higher amounts of light from entering the eye. Low vision devises such as bioptic lenses, telescopic lenses, and magnifiers also provide individuals with albinism the ability to utilize their best available vision.

**Recentlly Diagnosed with Low Vision?**

It may be that low vision has been gradually increasing, lessening your sight, or perhaps it is an abrupt dramatic change in lifestyle; whatever the cause for each individual’s low vision diagnosis, the questions, wants, and needs for vision assistance and understanding can be addressed together.

Approximately 135 million people are presently living with low vision. These individuals are not limited to a specific age group, genetics, or medical situations; they are each unique, with independent factors that have contributed to the overall diagnosis of low vision. As with any diagnosis, it is wise to ask your Doctor and Eye Care Specialist questions.

There may be specific restrictions and treatments available for your particular low vision condition that might not apply to another individual with low vision.

**What to ask Your Doctor?**

Knowing what questions to ask is among the first steps to best equipping your life for visual success when you have been diagnosed with low vision.

Below are a few questions to ask your Doctor and Eye Care Specialist. There is no wrong question or worthless concern. The more you ask, the more you are able to know and understand.

- **What changes can I expect in my vision?**
- **Will I lose more vision, if so, how much?**
- **Is it possible for me to wear regular corrective lenses (glasses or contacts)?**
- **Are there medical or surgical procedures that will correct or improve my visual condition?**
- **What can I do to protect and prolong my remaining vision?**
- **Are there diet, exercise, or lifestyle changes that I can make which will benefit my vision and condition?**
- **Where can I get a comprehensive low vision eye exam?**
Recently Diagnosed with Low Vision? — Patient Information Guide To Low Vision

• Can you refer me to an Eye Care Specialist?

Questions for Your Eye Care Specialist:
• What can I be using in my daily life to assist with visual tasks?
• Are there visual resources available to me for my work/school?
• Are there support groups and training groups which can help me learn how to live successfully with low vision?

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

A. While some eye diseases can cause total loss of sight, most, such as macular degeneration, generally do not. Even those diseases that can cause blindness can usually be controlled, with proper management. Most people with low vision have a great deal of usable eyesight. Some may be considered legally blind, meaning they have less than 20/200 vision or their field of vision is restricted to a 20-degree Diameter, but even then they are able to have some vision with proper instruction and vision enhancement. With training, you can learn to adapt to the changes in your vision.

Q. Will I always have low vision?

A. Some causes of low vision such as cataracts are very treatable and some 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. A lot of research is underway on both the prevention and treatment of eye diseases. Even nutritional strategies may be able to slow the development of some conditions. Consult the support organizations web sites and resources listed in this guide (page 11) to stay abreast of current developments.

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

A. Fortunately, many aspects of vision rehabilitation are now covered by Medicare as well as some private insurance companies. However, many of the adaptive devices used to help increase your visual freedom are not covered by most insurers and must be paid for by the patient. You may also be able to finance your purchase of low vision devices, with little or no interest, through resources like CareCredit.

If you are experiencing any changes in your vision it’s important that you go to an eye care professional immediately. 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.

If you have suffered 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.

Vision Rehabilitation:
Vision rehabilitation programs have been created to assist individuals living with low vision, with obtaining the tools and skills necessary to utilize remaining vision to its fullest ability. Learning how to navigate through daily activities such as reading, writing, self-grooming, work, and school, are among a few targeted areas of rehabilitation.

A variety of programs and aids for visual independence are exercised in order to find the individuals best vision enhancing resource(s). Prescription glasses, vision enhancing aids, specialized computer software, glare control
lenses and screens, lifestyle modifications, skill training, patient and family education services, counseling, household assistive devices, and driving rehabilitation are all examples of vision rehabilitation programs.

**Participating in Vision Rehabilitation:** An exam will be performed to establish the vision rehabilitation needs for each individual. Differing from that of an ordinary eye exam, an eye care specialist will examine the functional capabilities and needs of the patient’s vision and evaluate the characteristic of the disease and the impact on daily visual performance. During the exam a proposed method of vision rehabilitation will be prescribed, presenting the patient with available therapies, counseling services, and visual aids. Referral services for vocational and educational counseling may be supplied by the eye care specialist, including those specializing in family, patient, and psychological support.

**What to expect from Visual Rehabilitation:** As mentioned above, there are several areas where additional visual and personal support can be provided.

Many of the vision rehabilitation programs consider the following when determining the correct therapy for the patient.

**General prescription glasses:** The use of prescription glasses may increase sight and may include a tinted lens to limit excessive exposure to lighting that can further damage the eye.

**Glare control:** The use of prescription glasses may tint or diminish the amount of light entering the eye, while increasing the magnification and focus of the patient’s sight. However, additional glare protection may be necessary. Simple adjustments like wearing a hat outdoors, a glare protective screen on the computer, or modified lighting in the home or office may also be suggested.

**Optical Aids:** Stronger than general eyeglasses, optical aids include the use of bioptic or telescopic lenses. This may be required for individuals with low vision (near or farsighted) when performing tasks like reading, writing, waiting for a bus, identifying street names, etc.

**CCTVs:** A CCTV (closed circuit television) may be used as an electronic magnifying system in which a computer (or closed circuit) monitor displays the material or information on the screen for powerful magnification.

**Computer vision enhancing programs:** For business and school, specialized computer software and devices such as video magnifying cameras may be extremely useful for an individual.

**Hand-held reading magnifiers:** Electronic reading magnifiers may be useful for individuals with low vision when performing a variety of daily tasks. Used for both in home and on the go, a hand-held magnifier may provide an abundance of visual freedom and enhancement.

**Patient and family education and counseling:** Empowered through professional advice and guidance, patients and family members gain the understanding and tools necessary to cope emotionally and physically while living with low vision.

**Low vision device training:** If a low vision device is prescribed, a low vision device technician will be available to teach the patient how to use the aid. These technicians are often able to make in-home and in-office visits if need be.

**Rehabilitation teacher:** In the event that major life changes are necessary, such as learning to use Braille, a rehabilitation teacher will assist the individual with the learning challenges and transitions.

**Occupational therapy:** Assessing the need for an occupational therapist may also be a part of the patient’s vision rehabilitation program.

**Mobility and orientation training:** In the event the individual requires increased assistance for safe mobility (including the use of a seeing-eye dog), orientation and training is provided.

**Driving:** During the rehabilitation exam the issues and concerns regarding safe driving and visual ability will be reviewed. Additional testing may be required by the Department of Motor Vehicles.
Vision Enhancement Products — Patient Information Guide To Low Vision

School and special education programs: Should there be a reason for special education services, available options will be discussed and recommended.

Support Groups: Participating in support groups may serve as an emotional and informative tool, increasing understanding and support, for individuals with low vision. The many resources for different types of support groups available will be discussed and suggested. It may also be expected that multiple vision rehabilitation exams will be required over time as your vision changes, and new technologies and services become available. As each program is uniquely designed to meet the visual success for each person, the recommendations for certain programs and resources will vary from case to case.

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 may find that your state has at least one library offering Talking Books and large print publications. Many banks also offer large-print checks. Services, like the utility or phone companies, may offer large-type billing. There are large-print newspapers, reading services, and special TV video services available 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 to help enhance your visual freedom and daily life.

Having low vision makes colors have less vibrancy and a dull appearance, distinguishing between colors and shadows becomes more difficult. With vision enhancement products, you have the ability to choose from different contrast-viewing modes, images and text can become clearer. (Such as switching the image to be viewed in black and white).

Image Capture:
For low vision individuals with peripheral or tunnel vision, this is a wonderful feature. The image being viewed can be ‘captured’ (think snapshot) and moved into a visible area for the eye to see.

Electronic Magnifiers:
Portable and stationary electronic magnifiers have been developed to assist individuals living with low vision. These magnifiers offer unique features specially designed with vision enhancing criteria based on various eye disease symptoms. Adjustable magnification, additional lighting, contrast and color viewing options, screen preferences, mobility, and operation (ease of use), are all possible features on an electronic magnifier.

Portable Electronic Magnifiers:
Perhaps the most versatile group of magnifiers, are the portable electronic ones. These devices provide magnification on-the-go and can be used in various situations. Developed by a variety of manufactures, certain portable magnifiers offer outstanding visual support in the palm of your hand.

Lightweight and easy to use, the portable electronic magnifier by Enhanced Vision (the Pebble), provides up to 10x magnification power, 28 viewing modes, and a LCD screen (3.5” or 4.3”) for crisp and clear viewing. Additional lighting and advanced features puts this small (able to be carried in a purse or pocket) magnifier among the highly desirable daily low vision aids. The use of an electronic magnifier such as the Pebble, are often well matched for an active day out and about (menus, shopping, marketing, drug store, bus schedules, etc), and is functional in the home as well (mail, directions, TV guide, phone, and reading). Along with hand-held electronic magnifiers, there are also larger portable electronic magnifiers.

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These magnifiers are terrific tools for professionals, students, and at home use. Designed for optimal versatility, these magnifiers may be used at multiple viewing stations. The portable electronic magnifiers generally consist of a camera (live video) and a monitor in which the information magnified may be viewed in real time. This type of magnifier is particularly useful for self-viewing and distance viewing. These cameras (like Enhanced Vision's Acrobat 3 in 1) have the technology for telescopic viewing and magnification. The camera can be aimed (think: presentation) at a board or PowerPoint presentation to gather the information and display it on the personal monitor for the individual to view in real time. By simply changing the aim of the camera to a self-viewing mode, the camera creates a mirror image in real time and magnifies it on the viewing screen (which is helpful for applying makeup or shaving). The camera and holding arm pieces are lightweight and more powerful than a hand-held electronic magnifier.

**Desktop Electronic Magnifier:**
Ideal for a stationary workstation and for sustained periods of use, the desktop electronic magnifier is the most powerful magnification device presently available. Producing up to 85x magnification, desktop magnifiers like the Merlin present innovative technology with a thorough understanding of the visual complication caused by low vision. Often built ready-to-use, offering the option of computer connectivity, these electronic magnifiers are perfect for office or home use.

**Transformer:**
Transformer is the most flexible and portable solution for reading, writing and viewing magnified images at any distance.

**Acrobat LCD:**
This 3-in-1 video magnifier allows you to view objects near and far. Acrobat LCD offers the versatility needed to read, enjoy hobbies and see loved ones. This portable system with memory is easy to transport and set-up.

**Merlin LCD:**
Imagine being able to read your favorite books and magazines again. Enjoy family photos, cross-stitch or a crossword puzzle.
Resources — Patient Information Guide To Low Vision

The list of low vision support organizations and companies is enormous — far greater than we have space for in this Guide. Listed below are a few of the principal resources that may be of use to you (each of these will probably lead you to more).

Consumer Resources:

- **American Foundation for the Blind**
  Toll Free: 800-AFB-LINE (800-232-5463)
  www.afb.org
  Wide range of information, advice and resource links

- **American Macular Degeneration Foundation**
  Toll Free: 888-MACULAR (888-622-8527)
  www.amdf.org
  Wide range of information, advice and resources specifically relating to macular degeneration.

- **Audio-Reader** (Radio and Audio Service for Blind and Print-Disabled Persons)
  Toll Free: 800-772-8898
  http://reader.ku.edu
  Radio and reading service from University of Kansas for people within their listening area.

- **Enhanced Vision Low Vision Solutions**
  Toll Free: 888-811-3161
  www.enhancedvision.com
  Portable and desktop electronic magnifiers.

- **Foundation Fighting Blindness**
  Toll Free: 888-394-3937
  www.blindness.org
  Wide range of information and references on all types of retinal disorders

- **Lions Clubs**
  www.lionsclubs.org
  Go to web site to find phone numbers for clubs near you and to learn more about Lions Clubs Vision Programs Support Resources

- **Macular Degeneration Partnership**
  Tel: 310-423-6455
  www.amd.org
  Wide range of information and resources related to macular degeneration.

- **Lighthouse International**
  Toll free: 800-829-0500
  www.lighthouse.org
  Direct: 212-821-9200
  www.shop.lighthouse.org
  Lighthouse International is dedicated to fighting vision loss through prevention, treatment and empowerment.

- **National Eye Institute**
  Tel: 301-496-5248
  www.nei.nih.gov
  Research and current studies.

- **National Federation of the Blind**
  Tel: 410-659-9314
  www.nfb.org
  Information, advice, resources and links.

- **The New York Times Large Type**
  Toll Free: 800-NewYorkTimes (800-631-2580)
  www.nytimes.com
  Large-type publication

- **Reader’s Digest Large-Type**
  Toll Free: 800-807-2780
  www.rd.com
  Large-type publication

- **Veterans Administration**
  Medicare: cms.hhs.gov/home/medicare.asp
  Toll Free Medical Care:
  800-827-1000
  cms.hhs.gov/medicaidgeninfo
  Toll Free Health Care Benefits:
  877-222-8387
  www.va.gov
  Contact web site for location of your nearest VA office and information on low vision services.

Professional Resources:

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

- **American Academy of Optometry (AOA)**
  Tel: 301-984-1441
  www.aaopt.org
  Wide range of information, advice and resource links.

- **American Optometric Association**
  Tel: 314-991-4100
  www.aoa.org
  Research and clinical information.

- **CareCredit®, A Division of GE Consumer Finance**
  Toll Free: 800-677-0718
  www.carecredit.com
  Flexible payment plans for patient care and products available through approved providers.
Thank You!

We hope this Guide will help to open a new world of possibilities for you and your loved ones. Contact these web sites, call the eye care professionals, ask questions, and keep asking until you get the answers you’re seeking. Be bold.

Millions of people live full, active, independent lives with low vision and so can you. There are people waiting to help you, you just need to take the first steps and call. If we can provide you with any additional information please contact Enhanced Vision at 888-811-3161. www.enhancedvision.com.

For a FREE no-obligation demonstration of Enhanced Vision products call:

(888) 811-3161

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