

# **Learn About Low Vision**

Patrick J. Fischer

Copyright © 2016-2020 Patrick J. Fischer

All rights reserved.

Accessibility dot Net, Inc.

# Contents

Introduction

What Is Good Vision?

What Is Low Vision?

What Is Visual Acuity?

What Is Visual Field?

What Is Blindness?

Eye Doctors and Vision Professionals

Common Types of Visual Impairment

Low-Vision Aids

- Contrast

- Lighting

- Tactile Markings

- Talking Gadgets

- Large Print

- Over-the-Counter Magnifiers

Contact Us

## **Introduction**

This book was written to help people with low vision and also to help those who are trying to help someone else with low vision. This is a simple book and one that can be shared with everybody in the family.

If you have low vision, you are not alone. According to the National Eye Institute, millions of Americans and about 135 million people worldwide have low vision. Having worked with technology in the blind and visually impaired field since 1990, I know this book is needed today. This book will give you some basic information about eye doctors, low vision, and low-vision aids which can help you now. I will describe the low-cost technology aids that can help you now. Lastly, this book will provide you with my contact information so you can email me and tell me what State you need help in. I will email you a list of local organizations in your own state that can help you now.

In 1985, I was sitting with my grandfather Francis, who had low vision and struggled with reading. He used a lighted magnifier with a 1.25-inch-square acrylic lens, which did help him read, although it was a very slow process. Grandpa told

me that day that reading was very important to him; all his life, he had read in order to learn new things and keep up with what was going on in his community. The importance of reading cannot be overstated—it allows us to learn, grow, worship, and imagine. Reading is fundamentally a part of healthy living, and that is why I believe it is so crucial to help those with low vision retain the ability to read.

First and foremost (and you will hear me say this many times in this book), it is very important to get your eyes checked on a regular basis. Everyone needs to develop a relationship with an eye doctor in his or her community and get his or her eyes checked on a regular basis. All people at all ages need to get their eyes checked to ensure they have healthy eyes. Eye doctors can find the beginning stages of low vision, which will allow them to help you now and will prevent your vision from getting worse. If you have low vision, then an eye doctor who specializes in low vision can provide the best solutions to help you. The most important point I want to make in this book is to ***get your eyes checked*** on a regular basis!

In addition to encouraging you to see your eye doctor regularly, I also want to promote the low-cost solutions and great services available that can help you remain independent and allow you to read printed material. This book will explain what low vision is, and introduce the low-cost technology aids that are available now. This book will also help a person with low vision regain his or her self-confidence by providing ways to accomplish daily activities, remain independent, and continue to read.

## **What Is Good Vision?**

To understand low vision, let's review what good vision is and how it works. Central vision is the vision we use when we look directly at something. It provides us the most detail to read print, thread a needle, and recognize faces.

Peripheral vision is the vision we use around the edges of our central vision, and although it is not as detailed as central vision, it allows us to see a large visual field. When you hear someone say "I saw that out of the corner of my eye," that person is referring to using his or her peripheral vision.

## **What Is Low Vision?**

Low vision is defined as visual impairments that are not correctable through surgery or corrected lenses. Low vision causes a reduction in visual acuity, visual field, or both. The term *low vision* is often used interchangeably with *visual impairment*. Low vision refers to a loss of vision that may be severe enough to prevent someone from completing daily activities such as reading, cooking, using a computer, or walking outside safely. With the proper help, a person with low vision can learn to complete his or her daily activities and live independently.

## **What Is Visual Acuity?**

Visual acuity refers to the clarity and sharpness of vision. Visual acuity is measured by the ability to tell the difference between letters or numbers at a given distance according to a fixed standard. The visual acuity is the clinical measure of an eye and is usually given in a fraction to measure print size. This fraction refers to the clarity or sharpness of your vision. Normal visual acuity measured at a distance of twenty feet is expressed as 20/20 vision. If you have 20/20 vision, at twenty feet you can see clearly what should normally be seen at that distance. If an individual sees 20/200, the smallest letter that this individual can see at twenty feet could be seen by someone with 20/20 vision at two hundred feet.

Nearly two centuries ago, doctors agreed upon the standards of measurement of visual acuity (clarity and sharpness) that define “normal” vision for people. The familiar chart that is still used by eye doctors today to measure visual acuity is called Snellen’s Chart.



E	1	20/200
F P	2	20/100
T O Z	3	20/70
L P E D	4	20/50
P E C F D	5	20/40
E D F C Z P	6	20/30
F E L O P Z D	7	20/25
D E F P O T E C	8	20/20
L E F O D P C T	9	
F D P L T C E O	10	
F E R O L C P T D	11	

Snellen's Chart was invented by a Dutch ophthalmologist named Hermann Snellen (1834–1908). Even the specialized lettering used on the chart was developed by Dr. Snellen, and this type of lettering remains the same today. Dr. Snellen, along with some of his colleagues, found that twenty feet is the distance at which the average, healthy eye is able to see clearly without strain or compensation.

### **What Is Visual Field?**

Visual field refers to the total area in which objects can be seen in the side (peripheral) vision as you focus your eyes on a central point. The visual field is the total area seen while looking straight ahead without moving your eyes.

### **What Is Blindness?**

Legal blindness is a level of vision loss that has been legally defined to determine eligibility for benefits. The clinical diagnosis for legal blindness refers to a central visual acuity of 20/200 or less in the better eye with the best possible correction and/or a visual field of twenty degrees or less. Many people who are diagnosed with legal blindness still have some useable vision. Total blindness refers to an inability to see anything with either eye.

## **Eye Doctors and Vision Professionals**

There are two types of eye doctors: optometrists and ophthalmologists. There are also other important professionals in an eye doctor's office, including opticians, assistive-technology specialist, orientation and mobility specialists, occupational therapists, and vision-rehabilitation therapists.

### ***Optometrists***

An optometrist is an eye doctor who has earned a Doctor of Optometry (OD) degree. Optometrists examine eyes for both vision and health problems and correct refractive errors by prescribing eyeglasses and contact lenses. They often have someone on their staff to provide low-vision care and vision therapy, or they can refer you to a low-vision specialist in your area. Later in the book, I list out a link in your state so you can find an optometrist in your area.

### ***Ophthalmologists***

An ophthalmologist is a medical doctor (MD) who specializes in eye and vision care. Ophthalmologists are trained to perform the full spectrum of eye care, including conducting

exams, diagnosing and treating disease, prescribing medications, and performing specialized eye surgery. They also write prescriptions for eyeglasses and contact lenses. They often have someone on their staff to provide low-vision care and vision therapy, or they can refer you to a low-vision specialist in your area. Later in the book, I list out a link in your state so you can find an ophthalmologist in your area.

### ***Opticians***

An optician uses prescriptions written by an ophthalmologist or an optometrist to properly fit and sell eyeglasses and other eyewear for patients.

### ***Other Specialists***

Low-vision rehabilitation is a service provided by a team made up of assistive-technology specialists, orientation and mobility specialists, occupational therapists, vision-rehabilitation therapists, and other professionals. Low-vision rehabilitation services allow people who are blind or have low vision to continue to live independently and maintain quality of life.

An assistive-technology specialist is an individual who provides products and services that are designed to assist people with disabilities to choose, acquire, or use assistive-technology devices.

An orientation and mobility (O and M) specialist can help a person with low vision learn to move about safely in his or her home and travel outside without assistance.

Occupational therapists are professionals who help people remain independent. Some specialize in low-vision rehabilitation and can train people with low vision to use magnifiers, talking devices, and other assistive-technology aids. They can provide treatment only with the prescription of a medical doctor or a doctor of optometry.

Vision-rehabilitation therapists are specialists in independent living who train people with low vision to perform a wide range of daily activities.

## Common Types of Visual Impairment

The picture below shows four children as seen with 20/20 (normal) vision.



Below are four pictures that have been altered from the first picture to give you an idea of how vision is affected by the most common types of visual impairments. These altered pictures are based on other pictures available to the public that show the same comparison.

The most common types of visual impairment are

- cataract;
- glaucoma;
- retinitis pigmentosa (RP); and
- age-related macular degeneration (AMD).

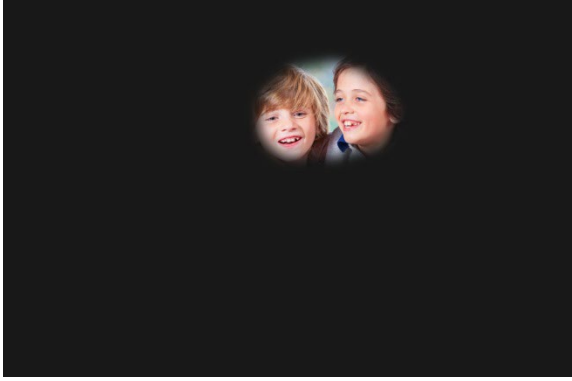


Cataract is a clouding of the lens of the eye and causes vision to be blurry. Cataracts are the leading cause of visual impairment in the world.

It is important to see your eye doctor for regular eye examinations. Cataract surgery is generally very successful in restoring vision. In fact, it is the most frequently performed eye surgery in the United States.



Glaucoma is a complicated disease that leads to progressive, irreversible vision loss.

	<p>It is important to see your eye doctor for regular eye examinations. If glaucoma is detected during an eye exam, your eye doctor can prescribe a preventative treatment to help protect your vision.</p>
	<p>Retinitis pigmentosa (RP) may appear at any age, but it usually begins in childhood or adolescence. At first, the person has trouble seeing in dim light. The visual field gradually narrows, causing tunnel vision. Tunnel vision looks like you are looking through a tube.</p>





Age-Related Macular Degeneration (AMD) is the leading cause of vision loss in the United States. Macular degeneration gradually affects central vision, and the person may experience blurred, distorted, or dim vision. It is very important for people with macular degeneration to monitor their eyesight carefully and see their eye doctor on a regular basis.

Additional causes of low vision include strokes, diabetic retinopathy, traumatic brain injury (TBI), and other diseases, such as Stargardt's, and retinopathy of prematurity (ROP).

## **Low-Vision Aids**

As you learn about people with low vision, you will understand that even if two people have the same type of low vision, different low-vision aids might help them. It is important to try different solutions until you find what best helps you. While one person may choose to read large print, others will use magnification, and still others will learn to use braille. Some people may have difficulty recognizing faces but may be able to read standard print with special glasses. When it comes to low vision, at one end there are various degrees of low vision and at the other end is blindness.

Low-vision aids break into several categories, and while some people may need to use items in all of the categories of low-vision aids, other people may only use a few items in a few categories. An important point to remember is that everyone is different and therefore has different needs, so you may have to try a lot of products until you find what works best for you. There are many options for visual aids; to make it easy to learn, I have divided the most common visual aids into the following categories: contrast, lighting, tactile markings, talking gadgets, large print, and over-the-counter magnifiers.

Since the majority of our time is spent at home, the first area to talk about making changes will be the home. These changes can also be made at your job with your employer's assistance. Two of the easiest areas to change are contrast and lighting. Always compare different choices so you can find what best helps you or the person you are helping.

## **Contrast**

When you modify your environment to make it more accessible for you or the person with low vision, contrast is very important to keep in mind. Contrast is defined as two things that are very different from each other—for example, making this **text bold** gives it great contrast compared to the other text.

Take the colors black and white as an example. These two colors are the opposite of each other. Black and white next to each other are the best example of contrast.

The person with low vision will let you know what colors he or she can see best, so make sure to display the different colors so that he or she can choose the best contrast. If you

go to a paint store, you can pick up paint chips of different colors to look at or show the person with low vision you are helping. Keep in mind that colors are divided into two categories: warm and cool, which contrast with each other. Cool colors are blue, green, and purple; they give the impression of calmness and cooler temperatures. Warm colors are yellow, orange, and red and are vivid and associated with warmer temperatures.

Changing colors to make a good contrast is an easy example that can really help a person with low vision. As an example, if your kitchen table is white, then dark-colored dishes offer the best contrast. This is an easy one to solve, as you can get a tablecloth that is the opposite color of your dishes.

Having the proper contrast in your home or office can make life more pleasant for a person with low vision, because he or she will easily be able to see what is needed to function.

Areas where you want to have proper contrast are where walls and floors meet, making it easier to walk from room to room. Stairs should have contrast on the steps so a person

can see the edge of each step. Putting a strip of colored tape on the edge of each stair provides great contrast. Every path you take in your home, along with every room you use, should be looked at and modified for the proper contrast.

You can look inside every drawer in your home and make the necessary changes so it will be easier to see what you are looking for. Change the colors of the inside of a drawer or maybe even get utensils that have colored handles so that the contrast will help you see what you need. Do whatever you have to do to make it easier to see and find what you are looking for. Reduce clutter and get rid of items not used so that it is easy to find what you need. Make your home and office the most organized you can and create contrast so that everything stands out and can be seen. These are simple changes to make, and they make a huge difference to the person with low vision.

Making these simple modifications to your environment will make it easy to walk around and find things as you need them. With the proper contrast, a person with low vision will be empowered and feel better at home or at work.

## **Lighting**

Lighting is an inexpensive solution that can greatly help a person with low vision read and remain independent. It is very important for safety reasons because it can help prevent accidents. Remember that everyone is different and someone with low vision generally needs more than one light source in a room, although some people may need less light.

Sunlight is a great light source but one that you need to control. Having blinds on a window are great because they allow a person to let light in and close light out as needed. Having the window blinds turned so the sunlight shines upward is best for some people, although sometimes you may want the window blinds turned so the sunlight shines downward.

Placing table and floor lamps next to the tables and chairs where reading takes place is also very important. Extra lights in halls and closets can help too. How you turn lights on is also very important. Pull strings are generally no fun to use because the string can be hard to see. A light switch that is always in the same place is best.

Always remember, what works for one person in terms of lighting may not work for another person. The best way to figure out what you need is to try different lights and experiment to find out what works best for you. You will be so happy once you improve your contrast and lighting!

### **Tactile Markings**

Tactile markings are inexpensive items such as bump dots, puff paint, or even small pieces of felt. We place tactile markings to help a person with low vision identify important settings and buttons on appliances, which makes it easier for the person to use these items. Tactile markings can be applied to stoves, microwaves, washers, dryers, telephones, and other appliances where you need to push a button or turn a dial to a certain point. Remember the importance of contrast as you purchase tactile markings, because they come in different colors. Always purchase tactile markings that provide the proper contrast for the person with low vision so he or she can see the tactile markings—use dark markings on a light background and light markings on a dark background. A low-vision specialist can help you discover the best approach to these situations.

Placing tactile markings on the outside of a dial helps a person with low vision feel for the proper place to stop when turning the dial. With the help of a low-vision specialist, these can be applied to the proper location so the person with low vision will not rely on trying to see it but instead will feel for the proper place to set a control. Stoves with digital displays are a little tricky, but a magnifier can be used to help those with low vision see settings like setting the oven temperature. Over-the-counter magnifiers will be discussed later in this book.

Puff paint is a great product to add tactile markings to almost anything, including paper, wood, cloth, and metal. It is a craft material used to add both texture and a great look and feel to an item. Unlike other paints that have a two-dimensional look, puff paint has a raised, three-dimensional appearance, which is great for persons with low vision. Puff paint is versatile because it adheres well to different surfaces. Apply puff paint directly from its tube applicator onto areas that you need to feel a tactile marking. A great place to use puff paint is a cable that has a top and bottom. A person with low vision can usually not see what is the top or the bottom



because the markings are small; a small spot of puff paint on one side makes it easy to use. Another great benefit to puff paint is that it comes in multiple colors, which helps with creating contrast.

Puff paint is my favorite tactile marking product because it adds a three-dimensional raised marking and comes in different colors, which makes a perfect solution for persons with low vision. Puff paint dries in approximately two to four hours, depending on the surface and thickness of marks. You can purchase individual tubes in common colors of red, yellow, blue, green, white, and black.

### **Talking Gadgets**

Talking gadgets are electronics that speak the information you would normally read with your eyes. These devices are very helpful for someone with low vision, because rather than strain to see something, all you have to do is press a button. There are many different types of talking gadgets. The following are the most common items used by those with low vision:

- clocks and calculators

- health products, including blood glucose monitors, thermometers, and blood pressure readers
- scales

## **Large Print**

*Large print* refers to the formatting of a book or other text document in which the font is considerably larger than usual, to accommodate people who have low vision. Sixteen point or higher type is considered the industry standard for large print.

The most popular large print items are large print calendars, address books, and check registers. The Jumbo Large Print Calendar is the most popular product in the large print family because it is useful for everyone. The Jumbo Large Print Calendar measures twenty-two by seventeen inches and comes ready for wall mounting. This handy calendar is made of white heavy bond paper with bold black print and a plastic spiral, making it easy to change months. There is plenty of room on each day and each calendar page for notes and appointments.

Large print books are a whole category, and many books are available. Amazon.com has the largest selection of large print books available for purchase, and finding books is easy because they are broken out into categories. These books are unabridged and contain the original content; they are not condensed or shortened in any way. If you read a book on a Kindle or other tablet, then you can increase the size of the font and make every book large print.

For persons who are legally blind, there is a national network of cooperating libraries, the National Library Service (NLS) which is a free library program of audiobooks and materials that are circulated by postage-free mail. In addition, BARD (Braille and Audio Reading Download) Mobile can be used to access talking books on various devices (versions are available for iOS, Android, and Kindle). Later in the book, I list out all of the library's in your state so you can sign up for the NLS and BARD library program.

Visit the Jumbo Large Print Calendar website (<https://largeprintcalendar.com/>) for more information about large print calendars, or buy them on Amazon Prime at (<https://www.amazon.com/largeprintcalendar>)

## **Over-the-Counter Magnifiers**

Over-the-counter magnifiers are useful for those with low vision. Some magnifiers have a light, and some do not. Some inexpensive magnifiers are made of hard plastic, and I do not recommend these because they typically have a limited magnification power and are easy to scratch. Bright, illuminated, handheld LED optic magnifiers are the best with magnification levels starting at 2X and going up to 5X and much higher. These can be purchased for between sixty and one hundred dollars. These can be easily carried in a purse or pocket. A magnifier with a large diameter typically offers more viewing area but less power. The greater the magnification, the smaller the lens.

When you have an appliance in your home or office that uses an LCD to display information, then an optic magnifier can be a great tool to use to see the display. Depending on the LCD display, it may work better to use the light on your magnifying device, and it may not. You should try both options to see which works best.

Dome magnifiers are dome-shaped and are easy to use. Many people with low vision find they are great for reading

newspapers, mail, and other printed materials. To use, you glide the dome magnifier over the material you are reading. These magnifiers also make great paperweights when you are not using them.

## **Directory of Services and Resources**

Up to this point, you have learned about many things that can help you with low vision—or can help the person with low vision you are assisting. To close out this book, I will provide a list of organizations in your state to contact if you need local assistance. I promise you—these organizations can help you.

- **State Agency for the Blind and Visually Impaired**

Find resources and support for families and friends of people with low vision. Contact your state agency and learn about the local help they can provide you now.

- **State Office—Veterans Affairs - Visual Impairment Services Team (VIST)**

The VA Visual Impairment Services Team program provides services to veterans and active duty service members experiencing vision loss. Veterans contact your local VIST Coordinator and get local help now.

- **State Organizations and Businesses Providing Low-Vision Support, Products, and Services**

This is a list of organizations that help persons with low vision. I personally know many on this list, and the others come highly recommended.

- **Lions Clubs International**

In 1925 Helen Keller challenged the Lions to be “knights of the blind in the crusade against darkness.” Since then, Lions have dedicated themselves to preventing blindness, restoring sight, and improving eye care services. The Lions are the world’s largest service club organization, and their members do whatever is needed to help their local communities. Use this site to find a lions club in your area.

**Link to find a Lions Club in your area:**

<https://directory.lionsclubs.org/?language=EN>

- **American Optometric Association**

Doctors of Optometry provide two thirds of all primary eye care in the United States. Use this site to find an optometrist in your area.

**Link to American Optometric Association**

<http://www.aoa.org/doctor-locator-search?tab=basic&sso=y>

- **American Academy of Ophthalmology**

This is the world’s largest association of eye physicians and surgeons. Use this site to find an ophthalmologist in your area.

## **Link to American Academy of Ophthalmology**

<https://secure.aao.org/aao/find-ophthalmologist>

- **NEI's National Eye Health Education Program (NEHEP)**

The National Eye Institute (NEI) established the National Eye Health Education Program (NEHEP) to help health and community professionals increase awareness about eye health. NEHEP programs promote the use of vision rehabilitation services.

## **Link to NEI's National Eye Health Education Program** -

<https://nei.nih.gov/nehep>

- **State Office for National Library Services (NLS)**

Through a national network of cooperating libraries, NLS administers a free library program of audio books and materials. Find the library in your state, so you can sign up for the NLS library program and get free books to read.



## Contact US

I hope you enjoyed reading this simple book about the basic information about eye doctors, low vision, and low-vision aids, and I really hope it helps you to understand more.

If you have any questions for me about low vision aides, high tech solutions, or anything else, I will be happy to answer them. If I don't know the answer I should be able to point you to someone that does.

You can send me an email by going to this page and sending me a message. <https://lowvisionrehab.com/contact>

## About the Author

Patrick J. Fischer believes that technology is the best way to improve the lives of the deaf, blind, and other disabled individuals. When he first entered the computer industry as a technician, he began volunteering to help disabled individuals learn how to use technology.

As Fischer moved through several different jobs in the industry, he continued to help the disabled community. Through his company, eventually called Accessibility dot Net, Inc., he began dedicating his career to helping people with blindness or low vision. In 2002, he opened his first showroom in Omaha, Nebraska, which sold low-vision products. He expanded to another showroom in Des Moines, Iowa.

Fischer has since closed the showrooms and now works directly with individuals, businesses, and doctors to help those in need.

Free State Resources are available at the Low Vision Rehab website - [LowVisionRehab.com](http://LowVisionRehab.com). Check it out and learn more.