

# Basics of Blindness and Low Vision

Basics of Blindness and Low Vision: Understanding a Low Incidence Disability. These instructional materials were created and compiled by the National Research and Training Center on Blindness and Low Vision, the NRTC, located at Mississippi State University. The NRTC's mission is to enhance employment and independent living outcomes for individuals who are blind or have low vision through research, training, education, and dissemination.

The NRTC was founded in 1981 and is the nation's only federally funded center focused on employment outcomes for people who are blind or have low vision.

Basics of Blindness and Low Vision - Part 1.

This section will cover the prevalence of visual disability. Definitions and terminology and common causes of blindness and low vision.

Prevalence of Visual Disability. The U.S. Census Bureau added disability-related questions to the American Community Survey, the ACS, in 2008.

This included identifying people with a visual impairment based on a yes response to the question, is this person blind, or does he or she have serious difficulty seeing even when wearing glasses?

The total estimated number of Americans with a visual difficulty is 3.6 million, a prevalence rate of 1.9 percent. Visual impairment is an extremely low incidence disability. The employment rate for people who are blind or have low vision was 51.2 percent in 2022, compared to 78.6 percent for individuals without disabilities. Vision loss often occurs with aging, with an estimate that two-thirds of people with an acquired vision loss are over the age of 65.

Definitions. An important concept is that blindness is a spectrum. Blindness is not typically the experience a sighted person has when they close their eyes or are in a dark room.

Visual impairment can range from total blindness to the ability to perceive light to extremely low vision. Legal blindness is a term often used in the realm of eligibility for state and or federal services or

benefits. The federal regulations refer to the term statutory blindness. The federal definition or designation of statutory or legal blindness contains two parts.

Part one refers to visual acuity, stating a visual acuity of 20/200 or less in the better-seeing eye with the best conventional correction, meaning contact lenses or glasses. Part two of the federal definition refers to the visual field, stating, or a visual field of 20 degrees or less in the better eye. What does this mean?

If you think of normal or average vision as 20/20, then an individual can see average-sized print on an eye chart at a distance of 20 feet and accurately read it. For an individual considered legally blind, with an acuity measurement of 20/200, they can read accurately at a distance of 20 feet, while someone with 20/20 vision can read accurately at 200 feet.

The concept of best correction is important. If an individual wears glasses or contacts and without them their acuity is 20/200, they are not legally blind. If an individual is totally blind in one eye or missing an eye, they still may not be considered legally blind if the other eye has good acuity and field measurements. An individual with one eye or totally blind in one eye may still be considered an individual with a disability but may not be legally blind.

Severe visual impairment does not meet the acuity or field measurement requirements for legal blindness with the acuity in the range of 20/70 and better than 20/200.

In many states, individuals within this range are unable to get a standard driver's license. Some states do provide restricted driver's license for individuals who qualify to utilize bioptic driving. And bioptic driving is a method of driving that uses both the driver's functional vision in combination with a bioptic telescope system.

In states that permit bioptic driving, intensive training in the use of the bioptic device and behind the wheel training are required. Low vision is a term often used to describe individuals with a vision that a medical professional may have indicated cannot be corrected with glasses or contacts.

Often vision can be described in terms of functional vision, and this often refers to individuals with low vision. Functional vision may be enhanced by environmental interventions or devices. Changes in lighting, color contrast, and simple magnification devices may enhance functional vision.

Terminology. Once visual acuity measurements exceed 20/1000, the eye examination reporting shifts from acuity to function. Eye care practitioners will use language descriptive of visual function versus acuity on eye reports. Commonly used terminology or abbreviations include CF for count fingers, HM or HMO for hand motion or hand motion only, LP, or LPO, for light perception or light perception only, and NLP for no light perception.

It's important to note that eye examination records typically include reporting for each eye separately, or there is an indication that a measurement is for both eyes. OD indicates the right eye, OS indicates the left eye, and OU is both eyes combined.

Common Causes of Blindness and Low Vision. The most common causes of blindness are cataracts, age-related macular degeneration, glaucoma, and diabetic retinopathy. Several of the following slides will include a video simulation or a photo simulation of the vision condition described.

Cataracts often, but not always, occur with aging. With cataracts, the crystalline lens inside the eye becomes cloudy, causing the vision to be like looking through fog or a dirty window. In most cases, cataracts can be safely and easily removed through surgery. In this simulation photo, four faces can be seen, but the image is cloudy and not crisp.

When you have cataracts, you may notice symptoms that come on gradually. The world may look blurred or hazy. Colors could appear faded or yellow. Glare from lights may seem intense at night, and you might have double vision or see several images in one eye.

Age-related macular degeneration, AMD, or simply macular degeneration, is the leading cause of vision loss among older Americans.

Macular degeneration affects the blood vessel layer underneath the retina. causing degeneration of the nerve tissue which is responsible for

receiving the focus light image of what one is trying to see. The affected macula is only a small part, one-fifth of an inch of the retina. But it is the part of the eye that allows one to see fine details, such as print, colors, or time on a watch.

The side or peripheral vision is usually unaffected, and this vision can beneficially be used in many circumstances. AMD alone will not typically result in total blindness, but it may lead to legal blindness. AMD can also cause severe restrictions in activities of daily living, such as reading, recognizing faces, using a computer, and watching television.

The same simulation photo with the four individuals contains an extremely blurry central spot, while the side images are relatively clear and crisp.

If you have macular degeneration, your vision may get very blurry. You may have trouble recognizing faces, straight lines could appear wavy, and you may notice blank or dark spots in the center of your vision. If the condition gets worse, it could take a noticeably faster and more severe toll on your sight. That doesn't happen often, though.

Glaucoma is a disease resulting in damage to the optic nerve from increased pressure or fluid inside the eye. Diagnosis is made by checking the pressure, examining the optic nerve, and measuring the visual field.

Treatment with medicated eye drops, surgery, or other medications may prevent further vision loss. An individual with advanced glaucoma will likely have peripheral vision loss or tunnel vision. As the central vision is where acuity and clarity is best, an individual with peripheral visual field loss due to glaucoma may be able to read regular print but have difficulty navigating around obstacles, seeing pavement irregularities, or seeing well in low light situations.

In the simulation photo, the image is relatively dark, with the exception of a blurry central image.

If you have the most common type of glaucoma, you could slowly lose your side vision over the years if you don't get treated. It may look like you're peering through a tunnel. Without treatment, you could eventually lose all your sight.

Diabetic retinopathy is a disease that causes damage to the blood vessels of the retina. Retinal blood vessels may leak, or hemorrhage under the retina, or new blood vessels may form on top of the retina. In severe cases, the retina may become detached from the blood vessel layer underneath it.

When this occurs, it may cause total and permanent vision loss. Early detection and treatment of diabetic retinopathy can be very effective in reducing vision loss. Vision loss due to diabetic retinopathy is often variable and progressive if not managed. Symptoms may include a reddish tint to the vision, blind spots, and a general lack of acuity or sharpness of vision.

There may be no uniform pattern to the vision loss, and quality of vision may fluctuate when blood sugar is high or low. The simulation photo is generally blurry, with multiple dark blind spots throughout the image.

Take a look at this scene. If you have healthy vision, this is what you see. But things look different for people with diabetic retinopathy. Diabetic retinopathy can cause vision loss and blindness in people with diabetes. The spots that look like shadows are floaters. They come in different shapes and sizes, and they constantly move around. People with diabetic retinopathy may also have blurry vision, especially in the center of their vision.

The good news is that dilated eye exams can find diabetic retinopathy early, and taking steps to manage your diabetes can help prevent or delay vision loss.

Retinitis pigmentosa, or RP, is typically considered an inherited disease causing the degeneration of retinal tissue in the back of the eye. RP usually causes a gradual decline in vision, starting with peripheral vision loss that may progress to total blindness.

Night blindness is the most frequent early symptom of RP. A progressive genetic disorder, RP is usually diagnosed in adolescence or young adulthood. The simulation photo is almost fully black and dark, with a relatively crisp central image of a woman's face, essentially depicting tunnel vision.

**Other Eye Conditions.** Retinal detachment is usually caused by trauma to the eye but may be secondary to other conditions, including diabetic

retinopathy or retinopathy of prematurity. Symptoms include the sudden appearance of many floaters or tiny specks that seem to drift through the field of vision. Flashes of light in one or both eyes, blurred vision, gradually reduced peripheral vision, and a curtain-like shadow over your visual field.

There are several techniques or treatment for a retinal detachment. An argon laser is a hot laser that is used to tack or seal up the area that needs to be reattached. Injecting gas into the retina may cause the retina to be pushed back into place.

A scleral buckle is when a small synthetic belt is placed around the eye to apply pressure externally. The image in the slide shows how a scleral buckle might look. It is woven under the muscles and recreates pressure in the eye where it is applied. There is a 90 percent success rate following surgery, if the surgery is done on a timely basis.

Keratoconus is a non-inflammatory stretching of the central portion of the cornea, resulting in a protruding of the cornea. It is often hereditary, and symptoms usually become apparent in the early 20s. The condition is characterized by a progressive thinning and steepening or protruding of the central cornea.

The symptoms include nearsightedness, blurred vision even with corrective lenses, glare at night, light sensitivity, and frequent changes in lens prescription. A classic symptom is chronic eye rubbing. The slide includes an illustration of an eye from a side view. with a cornea protruding off the lens in a cone like shape.

This slide includes an image of a street sign with four street signs. All signs and surrounding images are extremely blurry, and the words of the sign are reflecting double vision. This is a simulation of how someone with keratoconus might see.

Treatments for keratoconus include corneal cross-linking. This is when doctors use a special medicated eyedrop and ultraviolet light from a special machine to make the tissues of the cornea stronger. This treatment doesn't cure the condition, but the strengthening of the tissues should limit the progression and further steepening of the cornea.

Rigid gas permeable contact lenses are hard contact lenses that can be custom-designed for the unique shape of a cornea. They protect the eye

health by allowing the cornea to breathe through the material. These lenses often provide good vision correction but often can't be worn for long periods of time.

Approximately 15 to 20 percent of individuals with keratoconus ultimately require a corneal transplant. A transplant is warranted when the cornea becomes dangerously thin or when the visual acuity decreases significantly and cannot be corrected with contact lenses, or the steeping of the cornea makes the wearing of the contact lenses intolerable to the individual. For many, corneal transplant, improves vision, and quality of life.

**Other Causes of Vision Loss.** Other causes of vision loss include trauma and injury and other chronic health conditions, including multiple sclerosis, lupus, and high blood pressure. Vision loss can also result from severe infections or as a result of a stroke. Inherited conditions that result in retinal or optic nerve dystrophy can also cause blindness or low vision.

**Causes of Vision Impairment for Children.** Retinopathy of prematurity, or ROP, is an eye disease that can occur in premature babies or babies that weigh less than 3 pounds at birth. ROP happens when abnormal blood vessels grow in the retina.

There are five stages of ROP. The stages range from Stage 1 - Mild to Stage 5 - Severe. Babies in stage 1 and 2 may improve without treatment and go on to have normal vision. Stage 3 babies may need treatment to stop abnormal blood vessels from damaging the retina and causing retinal detachment. Babies in Stage 4 have partially detached retinas, and babies in Stage 5 have full retinal detachment. Even with treatment, babies in Stage 5 may have vision loss or blindness.

Cerebral visual impairment, sometimes referred to as cortical visual impairment, or CVI, is a temporary or permanent loss of partial or total vision due to impaired neurological interpretation of visual stimuli. CVI is not a result of physical damage to the eye but impaired functioning of the part of the optic nerve, or brain, responsible for visual stimuli.

CVI is the leading cause of vision loss in children in the United States. Often, the vision improves over time. But improvement can vary. Early intervention, therapy, and educational support can improve visual function.

Retinoblastoma, while rare, is the most common form of eye cancer in children. Enucleation, or removal of the eye, is often the treatment, but high survival rates occur when the diagnosis happens before age 3.

Albinism is a congenital disorder characterized by complete or partial absence of pigment in the skin, hair, and the iris of the eye due to a defect in the production of melanin.

Individuals with albinism may experience varying degree of vision loss and may be light and glare-sensitive.

## Basics of Blindness and Low Vision - Part 2.

In this section, we will explore a brief history of legislation related to blindness and low vision. We will compare combined and separate vocational rehabilitation agencies. We will identify employment barriers faced by individuals who are blind or have low vision. We will examine the roles of the rehabilitation team and discuss the concept of adjustment to blindness.

Important events and dates in legislation. 1840: The first employment program for individuals who are blind or low vision opened on the campus of the Perkins School for the Blind in Massachusetts. Perkins is the oldest school for the blind in the United States.

1879: Act to Promote the Education of the Blind created a \$10,000 subsidy that was allotted to provide embossed textbooks and educational materials.

1893: The Connecticut Legislature created the Connecticut Agency for the Blind, the first separate commission. The primary purpose was to provide teaching services to adults who were blind in their homes. Multiple states followed in establishing commissions for the blind.

1920: The Smith-Fess Act rolled out the first civilian vocational rehabilitation or VR program. Services included vocational guidance and placement programs. Under Smith-Fess, "homemaker" was considered a legitimate goal and eligible for VR services.

1931: The Library of Congress began distributing record players and reading materials on phonographs under the Pratt-Smoot Act.



1936: The Randolph-Sheppard Act provided priority to legally blind individuals to operate vending facilities on federal properties.

1938: The Wagner-O'Day Act made it mandatory for the federal government to purchase designated products for workshops for people who were blind. Today, this is known as the Ability One program.

1943: The Barden-Lafollette Act allowed state commissions for the blind to administer federally-funded VR services.

1973: Section 504 of the Rehabilitation Act Amendments prohibited the discrimination of persons with disabilities from any program or agency receiving federal funds. This was considered the Civil Rights Act for Individuals with Disabilities.

1975: PL 94-142, the Education for All Handicapped Children Act, established a free appropriate public education for all children and established special education services and included criteria for the Individualized Education Program, or IEP.

1978: Rehabilitation Act Amendments establish Independent Living Services.

1984: Rehabilitation Act Amendment establishes and funds the Helen Keller National Center for Deaf-Blind Youth and Adults.

1990: The Americans with Disabilities Act was signed into law.

1990: Revision of the Education for All Handicapped Children Act and it was renamed to the Individuals with Disabilities Education Act or IDEA.

1997: IDEA was amended to indicate that all children with visual impairment receive braille instructions under an IEP. Exceptions would be based on assessment by qualified professionals.

1998: The Assistive Technology Act was enacted to support the state's efforts to improve the provisions of assistive technology for individuals with disabilities.

1998: The Rehabilitation Act was amended to include Workforce Investment Act (WIA) and Job Training Partnership Act (JTPA). These streamlined employment programs, but also advanced independent

living services. Independent Living Services for Older Individuals Who Are Blind (OIB) was provided basic funding.

2010: The 21st Century Communications and Video Accessibility Act established the National Deaf-Blind Equipment Distribution Program.

2014: The reauthorization of the Rehabilitation Act under the Workforce Innovation and Opportunity Act, or WIOA. Increased emphasis was placed on workforce agency collaboration, transition and youth services, career advancement, and a dual-customer approach to job development for vocational rehabilitation. The “homemaker” goal was eliminated.

Vocational Rehabilitation Agency Structure. Does it matter? As noted, the Smith-Fess Act of 1920 created the first civilian vocational rehabilitation, or VR, agencies. These early VR agencies served few blind consumers. Instead, most individuals who were blind or had low vision sought services from non-governmental agencies.

As service delivery for individuals with blindness or low vision evolved, many states created separate VR agencies focused specifically on serving individuals who were blind or had low vision, often referred to as blind agencies. In 2024, there are 22 separate VR agencies for individuals who are blind or have low vision.

Other states operate combined agencies that serve individuals with all disability types. Combined agencies may have a division that specializes in services for individuals who are blind or have low vision. The existence of separate agencies has opposition based on they are often considered to be duplicative, expensive, and potentially unfair to individuals with other disabilities.

Opponents point to states with separate agencies as having to maintain two administrations and two budgets. On the other hand, many blind and low vision consumer groups, advocates, and professionals in the field promote the maintenance of separate agencies as they believe individuals with blindness or low vision have unique needs that are best served by dedicated agencies.

The National Research and Training Center on Blindness and Low Vision (NRTC) has conducted several research studies that support the maintenance of separate agencies for individuals who are blind or have low vision. Multiple studies found that, in general, separate agencies

serve consumers who are more socially and economically disadvantaged.

Overall findings indicated that consumers served by separate agencies were more likely to have more severe vision loss, be Hispanic, have less than a high school diploma, have a secondary disability, be female, and receive public assistance.

In general, consumers served by separate agencies are at a higher risk for unemployment due to their sociodemographic characteristics. NRTC research also found that consumers served by separate agencies typically received more services and spent more time utilizing VR services.

Research also found that separate agencies were more likely to provide consumers with adjustment services, on-the-job training and counseling and guidance services. In regards to the overarching goal of VR services, consumers served in separate agencies were found more likely to achieve competitive employment and report that incomes or earnings at case closure was their primary source of support, rather than public assistance.

**Barriers to Employment: Negative Attitudes and Bias.** Research shows that negative employer attitudes lead to fewer job opportunities for individuals who are blind or low vision. Implicit attitudes about the inability and dependency of people who are blind can contribute to the low employment rate.

Because blindness is a low incidence disability, many people have never met or interacted with an individual who is blind or low vision. This may drive attitudes based on assumptions or stereotypes, and not based on actual exposure and interaction. Lack of knowledge related to available assistive technology and low-vision devices may result in an inability to understand how certain job tasks and independent living tasks can be successfully done by someone who is blind or low vision.

Research supports that an hour-long, one-on-one meeting with a hiring manager and a vocational rehabilitation professional significantly improved the hiring manager's implicit attitudes about the competence of people who are blind or have low vision.

Transportation. Individuals who are blind or low vision may have multiple issues related to transportation. They may live in areas with limited access to public transportation or paratransit, or live in areas where walking to and from work is not feasible.

Planning for and budgeting for transportation needs is critical. Developing a transportation plan and a backup plan will be an important aspect of employment success.

Options can include volunteer drivers, family or friends as drivers, paid drivers, and carpooling. Relocation to cities with more transportation options could be a consideration.

Lack of accommodations. An individual may experience vision loss while working and face barriers to acquiring accommodations to support job retention. Solutions include working with vocational rehabilitation for assistance with recommendations and possible purchase of accommodations, or contacting the Job Accommodation Network (JAN) as a first step. Job seekers who are blind or low vision. should understand their rights to request accommodations.

Lack of assistive technology (AT) and assistive technology training. The use of assistive technology devices or access technology can break down barriers related to employment.

NRTC research found that individuals who are blind or low vision used an average of seven assistive technology devices on the job. Access to AT is important, but training on the devices or software is critical to ensure efficient and effective use of the AT. AT training on appropriate devices or software should be an important consideration in service delivery.

Lack of accessibility of software and websites. While lack of accessibility of software and websites can impact daily living, the lack of accessibility greatly impacts the job search process, the application process, and the onboarding process. Proprietary software that is not accessible is a barrier to individuals who are blind or low vision in utilizing that software in job tasks.

And finally, a significant barrier to employment is lack of blindness-related skills. If an individual who is blind or has low vision struggles with

independently performing daily living tasks, this can be a barrier to employment.

Acquiring adaptive skills and techniques that will support independence is an important part of adjusting to disability, but also important in successful employment.

It's critical that an individual will be able to tend to their personal and hygiene needs. Manage their household tasks, such as cooking, cleaning, and laundry, and also be able to independently manage their banking and bills. An individual must also learn to travel independently and learn to navigate and arrange for transportation.

The Professional Rehabilitation Team. To support independent living and or employment, services may be provided by many professionals. Typically, it takes a team of professionals skilled in multiple areas. We will briefly discuss professionals who may provide services to individuals who are blind or have low vision.

Certified Orientation and Mobility Specialist, or O&M. These professionals teach skills and concepts to individuals who are blind or low vision to support independent travel safely in the home and community. Skills may include the use of a long cane, electronic GPS, using public transportation, and more.

Certified Vision Rehabilitation Therapist. These professionals teach adaptive independent living skills to support independence and daily activities. Skills may be taught in the home, community, rehabilitation facilities, and on the job.

Certified Low Vision Therapists help individuals use their remaining vision efficiently by recommending and training in low-vision devices and assistive technology.

Vocational Rehabilitation Counselors provide vocational counseling and guidance and coordinate vocational rehabilitation services to support competitive and integrated employment.

Teachers of the Visually Impaired are specialized teachers who receive certification and specialized training in meeting the educational needs of students who are blind or low vision.

Certified Assistive Technology Instructional Specialists, or CATIS, provide individualized training in the use of assistive technology specifically for individuals who are blind or have low vision.

Mental Health Counselors can provide mental health counseling to support adjustment to disability or other mental health needs.

Vocational Rehabilitation. Individuals who are blind or low vision may benefit from vocational rehabilitation services to support employment or retention of employment. Vocational rehabilitation services are individualized and based on each consumer's needs.

Some possible services may include a transferable skills assessment. This assessment will identify a consumer's work skills, maybe that they used in past work tasks, and identify new career fields in which the skills could also be used.

Vocational evaluation, an assessment to determine an individual's interests, abilities, and experience to guide career exploration, training, and job placement. Assistive technology training, which we've discussed previously. Orientation and mobility training. Independent living skills. Job placement.

Assistance with job accommodations. Benefits counseling. Benefits counseling can be provided to individuals who are receiving a social security benefit and may be concerned about the impact of working on that benefit.

What is Adjustment to Blindness? Adjustment is the process of responding to the ever-changing demands of life. Adjustment is a response to dramatic changes, such as the onset of vision loss, or minor changes, such as breaking up a daily routine by meeting a friend for lunch.

The life event could be positive or negative, and how an individual responds to it can have a long-term impact on their quality of life. The emphasis of acceptance is on examining how well a person has internally processed their life with a disability or a visual impairment.

Adaptation is an individual process that may parallel previously established coping styles and may be influenced by environmental situations. It involves learning or developing strategies that allow a

person to function in ways similar to how they operated before the onset of vision loss.

Considerations Affecting Adjustment. Age of onset. Individuals with congenital vision loss may initially think everyone sees or does not see just like them, and they may feel bad that other people are quicker at doing things. As they get older, they begin to realize that other people see things that they do not.

This may be a relief, because they now know it's their vision that is causing them to perhaps be a little delayed as opposed to their intellect. As they get older, they will likely go through many different phases and periods of adjustment.

For older individuals, some may see vision loss as a normal part of aging, but it doesn't mean they adjust easily. Sometimes their participation in daily activities is reduced because they haven't learned adaptive techniques.

Severity of vision loss. Typically, the more severe the loss, the more challenging the adjustment. If vision fluctuates, as often occurs with some conditions like diabetic retinopathy, the person may not know what to expect from day-to-day.

Progression of vision loss can also impact adjustment. Individuals face questions such as, do I make my life decisions based on what I'm experiencing right now? Or do I need to plan for the possibility of more vision loss in the future?

Other medical conditions. The presence of other medical conditions may also impact adjustment to blindness. Conditions such as diabetes, multiple sclerosis, or a brain injury may cause additional limitations and even impact blindness skills training that support independence.

Family and social supports. Family and social support can be a significant factor in the adjustment process. If others do basic tasks for an individual with vision loss, it may limit the individual's motivation to learn to do things for themselves. This can possibly lead to unnecessary dependency or learned helplessness.

Personality and self-efficacy. There are certainly differences in personalities. Some people have better coping skills than others. Some

individuals may have life experience facing challenges other than vision loss and develop mechanisms to adjust and adapt, while others may have limited experiences with challenges.

The concept of self-efficacy is also important. Self-efficacy is one's belief in one's ability to succeed in a specific situation or to accomplish certain tasks. With positive self-efficacy, an individual can perhaps envision themselves succeeding at certain tasks and then actually do the task. Someone with strong self-efficacy is usually better able to advocate for themselves. Self-advocacy is understanding your strengths and weaknesses and not letting others dictate what you can and cannot do.

Preconceived notions about blindness. Research shows that adjustment to blindness is also influenced by an individual's preconceived notions about blindness. Given that blindness is a low incidence disability, an individual experiencing vision loss may never have met or interacted with someone who was blind or had low vision.

If they viewed individuals who were blind or had low vision as helpless and dependent, this may impact their own adjustment process and their view of self. Finding positive role models and mentors who are blind or have low vision can be an important part of the adjustment process. Peer support groups and advocacy groups can also play an important and positive role.

Other Considerations. Adjustment can be impacted by an individual's culture and cultural values. Some cultures still hold negative attitudes about disabilities, and others may not value the diversity of an inclusive society. Gender and gender role expectations may impact adjustment and acceptance of disability.

We know some cultures and individuals have an egalitarian attitude toward gender, but others do not. A male with more patriarchal views may be more concerned with his ability to be a provider, and be reluctant to learning new ways to do daily living tasks independently, which is often an aspect of adjustment training. Obviously, we don't want to stereotype or generalize, but gender role expectations can greatly impact adjustment.

Intersectionality refers to the examination of possible multiple identities an individual holds, such as race, gender, gender identity, age, disability, sexual orientation, religion, and so on.



When considering an adjustment from an intersectionality approach, it's important to consider how various privileges or oppressions an individual experiencing vision loss may encounter due to the various aspects of identity.

Research supports that adjustment, acceptance, and adaptation to vision loss is a lifelong and fluid process. We focus mostly on acquired vision loss as we've noted that age related vision loss is increasing. But we do want to stress that adjustment, acceptance, and adaptation are also lifelong processes for those with congenital blindness.

One shouldn't assume that if an individual has always been blind, they fully adjusted, accepted, or adapted. Acceptance is the emphasis on the internal and often associated with learning new skills and abilities that build confidence and comfort with self as an individual who is blind.

Adaptation often reflects previously established coping styles and may be influenced by environmental situations. Adaptation involves learning or developing new strategies for living in ways like before vision loss.

I did want to make a note about adjustment to blindness training. This is a term often used to represent a slate of services usually provided by VR or an independent living program that are often sequenced to support independent living, employment, and acceptance.

It can include some of the services that we've already discussed, which could be orientation and mobility, learning how to utilize assistive technology, learning new independent living skills in the home and the community, but also peer support and self-advocacy training.

### Basics of Blindness and Low Vision - Part 3.

In this section, we will explore some commonly used assistive technology. Assistive technology. Screen readers are software programs that allow individuals who are blind or low vision to read text on a computer screen with a speech output or a braille display. Screen readers are most often used by individuals without useful vision.

Users will learn keystroke commands and functions to navigate with a screen reader. One commonly used screen reader is JAWS, or Job Access with Speech. VoiceOver is the screen reader built into Apple products.

Video magnifiers, or closed-circuit TVs (CCTV) are usually systems that utilize a stand-mounted or handheld video camera to project a magnified image onto a monitor or TV screen.

Cameras with zoom lenses provide variable magnifications. Options include changing text and background colors and controlling for brightness and contrast. There are also portable video magnifiers that open and close like laptops, and even smaller handheld magnifiers that are easily transportable.

Magnification software can also be installed and used. ZoomText Fusion It's a software program that includes screen magnification and screen readers and allows a user to pivot between the two as needed.

Optical Character Recognition, or OCR, provides individuals who are blind or low vision the ability to scan printed text and then have it spoken in synthetic speech or saved to a computer file.

Refreshable braille displays allows a braille reader to access information on a computer screen by displaying up to 80 characters of braille from the screen. The user then reads the information and the display refreshes with the next 80 characters. Some models offer note-taking and file storage options.

Apps. There are many applications that can be downloaded that are compatible with screen reader or screen magnification. These are just a few examples of apps that may be beneficial for individuals who are blind or low vision. BARD Mobile is the app offered by the National Library Services for the Blind and Physically Handicapped.

This app allows users to download thousands of books and magazines in audio or braille format. Be My Eyes is a free app that connects individuals who are blind or low vision with sighted helpers who can provide assistance with tasks such as finding lost items, reading labels, or description. The helper utilizes the user's phone camera to provide the assistance.

TapTapSee helps individuals who are blind or low vision identify objects in everyday life. The app lets the phone take a picture of something and the app will speak and identify the object. The app does require that the voiceover feature be turned on.

Seeing AI is a free app that narrates the environment and assists with tasks such as describing people or photos, identifying products, colors, and money, and also reading text.

The next few slides will have videos to demonstrate the use of some of these devices.

Hi, my name is Kendra, and I'm a Research and Training Associate at the NRTC. I'm blind, and I wanted to show you today how I can use a computer for my job. This is my inbox to my email, and I'm using a screen reading program.

It's gonna read to me what, um, emails I have here in my inbox. So, I'm gonna reply to her. I'm using all keystrokes to be able to open the emails, send them. There's no need to use the mouse. I can control everything through the keystrokes. And I am also able to access, a word processor, spreadsheets. And pretty much anything else I need to access for my job.

Hi, I'm Michelle and I'm going to be demonstrating ZoomText software for you today. Um, I am partially sighted. I'm quite severely sight impaired. But I've been using ZoomText for more than 10 years. And the great thing about ZoomText is that you can adjust the settings as your sight changes. Which is great for someone like me, because the condition I have is degenerating, and my sight goes through quite severe changes over time.

ZoomText has two functions: one of them is visually based, so it's magnification, it can change contrasts, and the other is speech based. So, I use both the settings, magnification and speech, to help me to navigate my computer. But you don't have to. You can use just magnification if you don't need speech.

What you'll also notice from my settings is that they are very large. And that is because that's what my vision requires at this stage. But the first thing you can do with ZoomText is adjust the magnification level. So, as you can see, mine is rather high. But it really doesn't have to be. this intense at all. You can take the magnification down quite significantly.

So, if I want to, for example, open a Word document, I use a combination of the sight I do have, and key commands and voice, so I'm

using a combo of listening and looking. Another feature of ZoomText is that you can adjust the contrast of your screen.

So, for me, just to show you how ZoomText actually looks properly, I left it on what would be the normal contrast, but that's not great for my eyes. I really battle with glare, and I'm quite light-sensitive. So, for me, a better setting is to have a high contrast setting. So, I'm just going to show you what that looks like.

Okay, I'm going down to the bottom, which is white and black, which is a color inversion. So, I'm going to get white text on a black background. It does change your, the visual look of things on your screen, which can be a bit difficult to get used to at first.

I'm going to go and open a document. At this point, I'm mostly using my ears here to navigate and my keys rather than my mouse, just because I find that that's a bit quicker for me.

So, here's just something, a little piece I've written in Word. So, this, for me, is really helpful in terms of my vision, having that white on the black, and to navigate the document, I can use the speech. I can use my mouse if I need to. And as you can see, every time I'm making a space, it reads the word to me. So, for example, this is ZoomText.

Because I own my own business, I am doing everything at the front end, like the actual counseling, and I'm also doing things in the background, running my business. That means accepting the money, cashing the checks, doing my own progress notes, and keeping track of accounting. So, I want to show you some of the tools that I use because I'm blind.

The first one that I use is a CCTV. I'm turning it on now so you can see what it looks like. And because of my eye condition, I need to have reverse color and much larger. So, I use this magnifier. As you can see, you can make it much bigger. And so, this is a check that was written to me. And in order to cash it, of course, I have to sign it.

So, I flip it over and I can use this magnifier to sign my name. And then after I do that, I deposit the checks through my phone, which also has some accessibility functions, which I'll show you. So, the last thing I want to show you is another tool that I use to help me with my blindness, which is my iPhone.

And on my iPhone, I have a number of different apps that help me read my mail. So, my literal mail, to tell if an envelope is written to me, I can have it read it to me. And also, I can open up a piece of mail, take a picture of it and have my phone read it. So, I'm going to demonstrate the first one, which is called Seeing AI. It's an app on my phone and I can hold it. That reads me the whole envelope so I can tell that it's for me important.

#### Basics of Blindness and Low Vision - Part 4.

In this section, we will identify common myths and misconceptions and review blindness etiquette.

**Myths and Misconceptions.** People who are blind develop a sixth sense, and other senses are heightened or enhanced.

Blindness does not heighten other senses. That being said, to compensate, individuals who are blind may listen more carefully, remember more without taking notes, but the other senses are not improved.

Let's watch this brief video. The video has two individuals. One is a man with dark hair and a mustache in a yellow shirt, and the other is a woman with dark hair in a black shirt. They are both blind.

No, it doesn't help your hearing.

No, the answer is we do not have better hearing. Again, we are not Daredevil. We don't have this ability to turn our ear and hear something from a mile away. What it is, is that we rely on our hearing more than if you are lacking in one sense, the brain is going to tap the other senses a little bit more to try to get that information.

Since I've lost my vision, I have gained the abilities, which one of my family members is approaching me based on footstep. I can hear things on the other side of the house because I put an effort into it. So, it's not that we get better hearing, it's that we have to focus and work on our other senses.

We do not have extra bionic supersonic hearing. That's a myth.

Other Myths and Misconceptions. All people who are blind can read braille and have guide dogs. Braille is an extremely beneficial skill. But actually, only a small percentage of individuals who are blind or low vision learn braille.

Often, adults with acquired blindness may learn some braille for practical reasons, like identifying public restrooms, elevator floor numbers, hotel room numbers, and also simple labeling to assist with home organization. But braille as a primary reading format is often limited.

Some individuals who are blind or low vision do use guide dogs. Others often use a white travel cane. It's important to note that either involves orientation and mobility training.

People who are blind use the technique of feeling others faces to know what they look like. The reality is, individuals who are blind or low vision follow the same social conventions as others. It is highly unlikely that one would want to touch the face of someone they were not intimately acquainted with, and according to many who are visually impaired, filling someone's face doesn't provide much information about what one looks like.

People who are blind or low vision cannot live independently. Individuals who are blind or have low vision can live, work, travel, participate in social activities and recreation independently.

There are very few occupations that an individual who is blind or low vision can do. With the right education and training, individuals who are blind or low vision can do almost any job a sighted individual can do. Limitations would only exist in an area where sight was critical for an essential part of the job. For example, driving.

All people who are blind or have low vision only see blackness. We've already discussed how blindness is a spectrum and can range from no light perception to low vision.

People who are blind or low vision cannot use computers or smartphones. As discussed, there are many assistive technology devices, adaptive software, and many built-in accessibility features that support an individual who is blind or low vision using a computer or a smartphone. It may take some training. But it can easily be done.

Myths and Misconceptions. Using words or phrases associated with sight around individuals who are blind or have low vision is offensive. Words referencing sight are frequently used as figures of speech by everyone, including individuals who are blind or have low vision. Let's watch a short video.

The video scene is an office with six individuals standing in a semi-circle laughing and talking. Five are women, and one is a man holding a long, white cane. He is blind.

Hey Lauren!

How you doing?

Good!

Did y'all see? I mean, um, I'm sorry. Listen. Did y'all listen to the game last weekend between Auburn and LSU?

No, I didn't.

Come on, Mallory. You didn't need to make this so awkward. Many people who are blind still use the words see, look, or watch. Let's try this again.

Hi Mallory.

Did y'all see the game last weekend?

Great game.

Much better, Mallory.

Just a few pointers on blindness etiquette. Introduce yourself upon meeting. It's critical that you verbally introduce yourself when walking up to or conversing with an individual who is blind or has low vision, even if it's a coworker you see every day.

A simple, Hi Steve, it's Mary, is important. Most often, if the individual who is blind or has low vision learns and recognizes your voice, they will let you know that this is no longer needed.

Groups or meetings should include an introduction of everyone, basically who is in the room, and everyone should continue to state their name prior to speaking or sharing during the meeting. Imagine if you were attending a meeting and had no clue who or how many people were in the room. Even in situations such as team meetings that may include an individual who is blind or low vision, a simple introduction of who is in the room at the beginning of the meeting is important.

Continuing to identify yourself when you speak or make a comment is also important. For example, This is Mary. When did we say the training would be? As before, if the individual who is blind or has low vision no longer needs this, he or she will probably let you know.

If you're walking away from an individual who is blind or low vision, let them know. If you need to step away to go to the restroom or you're actually leaving, just let the individual know. Hey Steve, I'm running to the restroom. I'll be right back. Or, Hey Steve, it was really good to see you. Let's catch up next time. Bye.

Give specific spatial directions. The chair is in front of you slightly to the left. Avoid directional phrases such as over there or using hand gestures. Never interact with a guide dog. Finally, and maybe most importantly, don't assume that an individual who is blind or low vision needs your help. You may ask them if they need your help, but you shouldn't make an assumption.

A few final thoughts on blindness etiquette. Treat an individual who is blind or has low vision just like you would anyone else. Don't treat an adult like a child or speak to them in a condescending manner. Speak directly to the individual, not their spouse, child, or other companion.

Remember, blindness is just one characteristic of a unique individual. While you may be curious about how they use adaptive techniques for daily living activities or how they use assistive technology for work tasks, keep in mind that just like all of us, they have unique interests, hobbies, and experiences that make them who they are.

The following video has several individuals who are blind responding to this question. What is the hardest part about being blind?

Totally, 100 percent for me, about not being able to drive. Sighted people can grab their keys and hit the road whenever they're ready most



times, but for me, I have to plan, which is fine. It just takes a little extra time.

One of the hardest things about being blind, from my perspective, is constantly addressing the misconceptions that are floating about. Things as simple as using a smartphone to using the computer, to being on social media, even putting on my makeup, or those types of things that I do in my everyday life. People think because a person is blind that that therefore means that they are unable to do things that other people can do, and it just simply isn't true.

The hardest thing about being blind, I would say, is just spontaneous independence. I miss the ability to kind of, you know, to drive. And when I wanted to do something, just jump in the car and go. I, you know, I used to love to go fishing and, you know, it might be a Saturday afternoon, it might be pretty, and I just would jump in my truck and, and go to the lake, you know. I still get to go fishing, But now it takes a lot of planning and coordinating, and you having somebody go with me maybe. So, it's really that spontaneous independence that I would say would be the most would be the hardest thing about being blind.

You know, I think one of the biggest things to deal with as a person who's blind is obstacles and low expectations. People don't think people who are blind can do a lot of things. And it can be humorous, but it can also be sad.

Probably not driving. And I would say, not being able to complete some information independently. You know, when things like banks or other services aren't accessible.

When I'm asked, what's the most challenging part about being blind? I would have to say it's being judged by others, and especially those who have never met me. People who are assuming what I'm able to do, and what I'm not capable of doing, especially in a work setting. The truth is, with training and time, I've developed skills and experiences, and I think I'm quite efficient at many of the same tasks everyone else is able to perform. I would tell you that I have the same desires and dreams and even personal and professional challenges as everybody else. My advice would be if you have any questions about how I perform things and what I'm capable of, please ask. I am very happy to talk about it.

The hardest thing about being blind is the lack of knowledge and education in our community and abroad. The fight that is a daily fight for inclusivity has always been very difficult, um, because sometimes it can feel very repetitive and very exhausting and frustrating to constantly have to tell your story and constantly have to fight for just the same day-to-day rights as everyone else.

We encourage you to learn more about blindness and low vision. Please visit the NRTC's website to learn more about our research, resources, and products.

There are many other helpful organizations. These include the American Printing House for the Blind, American Foundation for the Blind, VisionServe Alliance, Association for Education and Rehabilitation of the Blind and Visually Impaired, and Blinded Veterans Association.