Blindness & Low Vision

Also called Visual Impairment

Description of the Disability

Blindness is a catch-all term for a variety of significant problems with vision. Vision itself is a catch-all term for the activities our complex visual system performs, including the abilities to perceive detail (acuity), color, and contrast, and the ability to recognize objects. There are many things that can go wrong with parts of this system, each causing low vision or blindness in different ways. Many people classified as blind still have some **Residual Vision**, but usually not enough to identify objects without support. Some may have lost central vision, but still have peripheral vision. Others may see light and dark or have difficulty with contrast or focusing. Still others may have no vision at all.

There is a definition for “legal blindness” but it is not very useful for describing what a person can or cannot do. The legal definition is having central visual acuity (ability to see detail) less than 20/200 even with the best correction (glasses or something similar) or losing so much peripheral vision that the person can only see in the central 20% of the visual field. This definition is rather vague and is not the only “official” definition of blindness - different agencies and states may use their own definition. The definition for low vision is similarly vague about functional ability – visual acuity of less than 20/70 with the best correction and which interferes with activities of daily living. As with all disabilities, the best way to find out what a particular person can or cannot do/see is to ask them.

Medical Terms

The following terms are useful for understanding some of the language of optometrists (called "OD"s - doctors who prescribe lenses and treat some eye disease) and ophthalmologists (MDs, who diagnose & treat eye diseases and perform surgery):

- **Acuity** – the ability to focus on fine details of objects, such as reading or looking closely at an object. A person’s sharpest acuity is in the center of his or her vision. A person's acuity is measured in terms of the smallest object they can see at a distance of 20 feet and a projection of the distance at which a "normal" person could see it. So 20/200 means that at 20 feet the person can see what a "normal" person could see at 200 feet.
- **Amblyopia** – loss of acuity, experienced as a general dimming or blurring of overall vision.
- **Astigmatism** – A deformity in the cornea or lens, causing difficulty focusing objects at any distance, near or far.
- **Choroid** – A layer of tissue behind the retina that contains the blood vessels that feed the retina.
- **Cornea** – the outer, clear layer of the eye that covers the iris, pupil, and other eye structures.

- **Detached Retina** – Sometimes the retina separates from the back of the eye. Usually, damage to or tension on the retina causes a slight tear or hole, allowing the fluid inside the eye to flow behind the retina and peel it away. Without immediate treatment the person will loose sight in that eye and doctors treat this as an emergency situation. With treatment, some or all of the vision can often be saved.
- **Diopter** – a measure of the strength of lenses in glasses. The higher the diopter number, the more powerful the lens. Basic, drugstore reading glasses start around one half (.50) diopters.
- **Fovea** –the center of the Macula, the very center of your vision, where you have the best acuity.
- **Hyperopia** – Farsightedness. The person's eye is slightly shorter than normal, so when the eye is trying to focus on near images, the light coming in through the lens strikes the retina (back of the eye) before it comes into focus. The result is that the eye is not able to focus on near objects clearly, but it can still focus on objects far away.
- **Lens** – the semi-rigid, clear part of the eye just inside the iris, which focuses light and which flexes as you look far off or close up.
- **Macula** – The area at the back of the retina that makes up the center of your vision, where acuity is best.
- **Myopia** – Nearsightedness. The person's eye is slightly longer than normal, so when the eye is trying to focus on objects that are far away, the light coming through the lens gets focused just in front of the retina instead of directly on it. The result is that the eye is not able to focus on distant objects clearly but can still focus on objects nearby.
- **Night Blindness** (also called Nyctalopia and Impaired Dark Adaption)– not a true blindness but a difficulty seeing in low light. There are two issues involved – difficulty seeing shapes with low contrast in low light, and increased time for one's eyes to adjust to low light after being in bright light.
- **OD, OS, OU** – Abbreviations for Latin words meaning right eye (OD), left eye (OS), and both eyes (OU).
- **Presbyopia** – Aging eyes (usually). The lens grows rigid and less flexible, so it cannot focus across as wide a range of far and near objects. This begins happening to most people around age 40 or 50.
- **Retina** – the back of the eye where all the visual receptor nerves are located, the part that "sees" what you are looking at.
- **Retinopathy** – a generic term for a disease of the retina that does not involve swelling.
- **Scotoma** – a blind spot in the field of vision. The person may see it as dark or a neutral gray.
- **Strabismus** – when a person's eyes do not line up with each other but look in different directions. When the line of sight crosses, strabismus is known as being cross-eyed. Strabismus is caused by problems controlling the muscles that move and coordinate the eyes.

Common Conditions, Treatments, and Side Effects

The treatment for a vision disability depends on the person's disorder. Common causes of blindness and low vision and their treatment include:

Macular Degeneration (MD)

Macular Degeneration is a gradual loss of vision in the macula, the central part of the visual field. Usually, even in extreme cases, the person has peripheral vision and often they are able to "work around' the missing parts of their central vision. There are two common types of Macular Degeneration: **Early Onset Macular Degeneration** and **Age-related Macular Degeneration (AMD or ARMD)** (there are a few other, less common forms of MD as well). Early Onset MD is generally caused by one of several inherited conditions that cause the retinal cells in the macula to fail or begin to die. The degeneration is usually slow, and it can take decades to significantly reduce the person's central vision.

Age-related Macular Degeneration (AMD) usually does not begin until after age 40 or 50. There are two forms or subtypes of AMD - "wet" and "dry". Both involve the deterioration of the Retinal Pigment Epithelium (RPE), which normally insulates the retinal cells from some toxic elements in the blood. The RPE filters blood in the vessels of the choroid layer and passes the appropriate parts on to the inner retinal layer of the eye.

Wet AMD involves breaks in the RPE that allow the growth of small, leaking blood vessels into the retinal layer, a process called **Neovascularization**. These leaking blood vessels are why it is called "wet". This eventually disrupts and destroys the retina cells in the macula. These holes in the retina show up as small blind spots ("**scotomas**") in the person's central vision. Sometimes laser treatment can burn out those blood vessels and keep the damage from spreading, at least for a while. However, some types of laser treatment will also burn out the retinal cells in that region. Wet AMD is also called Choroidal Neovascularization, Subretinal Neovascularisation, Exudative Form, and Disciform Degeneration.

Dry AMD does not involve leaky blood vessels, but instead involves the buildup of a type of cellular waste under the RPE cells of the macula. Because of this cellular waste, the RPE cells stop filtering the blood as well, leading to deterioration and thinning of parts of the retinal layer. These thin places in the retinal layer show up as areas of low vision or blindness. There is currently no treatment to stop or control dry AMD. Researchers do not know why the cellular waste accumulates this way in the dry form, nor why the leaky blood vessels begin to form in the wet form.

Glaucoma

Glaucoma is an umbrella term for several diseases that all cause increasing pressure in the fluid in the eye (intraocular pressure). The iris of the eye floats in a small, fluid-filled section of the eye between the outer cornea and the lens. The body continually makes fresh fluid for this Anterior Chamber and continually drains the old fluid from the edges. Sometimes the old fluid does not drain fast enough, or at all, and pressure builds up. This in turn presses on the inner chamber of the eye and builds up pressure there. This pressure can pinch the blood

supply to the optic nerve and cause its nerve cells to die. Usually the person begins to lose peripheral vision first, although they may not notice it. If treatment does not stop the disease, they will gradually progress to tunnel vision, blurred vision, halos around light sources, blind spots, and eventual blindness. Often eye drops or pills can control the increasing pressure in the eye, but sometimes ophthalmologists use laser surgery or other surgery for glaucoma. These surgeries involve opening up the blocked areas through which the fluid normally drains from the anterior chamber. There are 5 common types of glaucoma: open angle or chronic glaucoma, low-tension or normal-tension glaucoma, closed angle or acute glaucoma, congenital glaucoma, and secondary glaucoma. Closed angle and normal-tension glaucoma can happen suddenly, with little warning. Secondary glaucoma is usually a complication of other eye problems or eye surgery.

Diabetic Retinopathy

Diabetic Retinopathy, also called Proliferative Diabetic Retinopathy, is a complication of advanced diabetes and is the most common cause of blindness in young and middle-aged adults. For several reasons, increased blood sugar levels cause small blood vessels in the retina to leak and extra blood vessels to grow in the retina. As these newer vessels also start to leak, the leaking blood clouds the eye's fluid. Any sudden jerks or increases in blood pressure can trigger more leaks. The leaks show up as red, gray, or black dots in the vision field and may take several weeks to slowly fade. The bleeding and the scarring it causes on the retina can cause parts of the retina to detach from the back of the eye. Often, laser treatment can seal up the blood vessels or re-attach sections of the retina. However, laser treatment can also damage night vision, or cause the retina to swell (macular edema) leaving blind spots called "**scotomas**." Another possible treatment is a **Vitrectomy**, in which the eye surgeon removes the clouded fluid in the eye and replaces it with an artificial fluid. Another problem with Diabetic Retinopathy is **Macular Edema** (ME), or swelling of the macula at the center of vision. This swelling upsets the physical mechanisms for focusing images on the macula. The result is blurred vision that makes the person feel like they are looking through rumpled cellophane. The best treatment for all of these symptoms is control of the person's diabetes and blood sugar levels, but even that may not prevent vision loss.

Cataract

A cataract causes cloudiness in the clear lens of the eye. When both eyes are affected, the condition is cataracts (with an s). Deterioration and clumping up of the transparent proteins that make up the lens cause the cloudiness, which usually involves the entire lens. Researchers are not sure why this happens, but age, smoking, and long exposure to sunlight seem to be common factors. Symptoms of significant cataract include cloudy or blurry vision, halos around lights at night, problems with glare from sunlight or bright lights, poor night vision, reduced color vision, and double vision. Most people get some clouding of the lenses as they age, and most cases of diagnosed cataracts are age-related. However, there are some other types of cataract including congenital cataract (develop in young children), cataract secondary to diseases like diabetes, cataract caused by steroid use, and cataract that develops after an eye injury. Fortunately, cataract is very treatable. When the lens becomes cloudy enough to be a serious problem, an eye surgeon can remove it and replace it with an artificial lens called an Intraocular Lens (IOL). On occasion an IOL is not appropriate and they may use contact lenses or powerful glasses to replace the lens. Sometimes the surgeon

leaves at least part of the original lens in place and sometimes that remainder becomes cloudy because of an **After-Cataract**. Eye specialists usually use laser surgery to remove these after-cataracts.

Retinitis Pigmentosa (RP) (also called Pigmentary Retinopathy)

Retinitis Pigmentosa is caused by any of several hereditary conditions. It is a progressive disease of the retina and is diagnosed by a distinctive pattern of pigment spots on the retina. These spots occur because pigments in the Retinal Pigment Epithelium (RPE - see above) migrate into the retina, but no one knows exactly how that is connected to the vision problems of RP. For some reason, the vision receptors in the retina begin to die out. The first receptors affected are the "rod" cells, which are better at working in low light than the "cone" cells (which see colors). Because of this, night blindness is one of the first functional symptoms. Because the rod cells are concentrated on the outer part of the retina, "tunnel vision" (a gradual narrowing of the field of vision) is usually the next functional symptom. However, RP eventually kills off both the rod and cone receptors, so most people with RP eventually become blind. One theory for the disturbance of the Retinal Pigment Epithelium layer (which causes the pigmentation pattern) is that the RPE is involved with removing dead vision receptor cells and it may become over active or overwhelmed by the increase in cell deaths. The progressive loss of vision usually takes decades, but different types of RP progress at different speeds.

Optic Nerve Atrophy (ONA)

Although some people use it as a catch-all term for several types of blindness, Optic Nerve Atrophy is actually a symptom, not a disease. It is a technical term for damage to the optic nerve, which can be caused by many different medical problems. In infants, causes include lack of oxygen in the body (hypoxia), trauma, tumors, and several hereditary conditions. In adults, causes include lack of blood to the nerve ("ischemic optic neuropathy"), shock, trauma, multiple sclerosis, tumors, and stroke. Glaucoma, described above, is a type of ONA. Some toxins can cause ONA and one source says the most common toxic cause in adults is methanol from "home brewed alcohol." There are many symptoms of ONA, including overall dimming of vision, loss of acuity (ability to see fine detail), reduced color vision, and total blindness. Because ONA involves nerve damage, there is usually no treatment except controlling the underlying cause, and the vision usually does not come back.

AIDS-related Blindness (Cytomegalovirus Retinitis)

Cytomegalovirus (CMV) is a herpes-type virus that can cause eye problems. Most adults over age 40 have antibodies to CMV, which means they have been infected and their immune system has neutralized it. People with impaired immune systems, including people with HIV/AIDS, people receiving chemotherapy, and recipients of organ transplants, can have serious problems with CMV. CMV Retinitis can cause bleeding and inflammation in the retina or detachment of the retina. It usually begins in one eye and spreads to the other. Without treatment, it causes blindness in 4 to 6 months. Treatment can slow down the damage, but not repair it.

Blindness Culture

There is a strong, active national community of people with blindness, which significantly increases the resources and opportunities available to them. Activists for the blind formed some of the first and most effective disability advocacy groups in the US, and some of the earliest laws for disability services are about services for the blind (see below). The blind population continues to be one of the most vocal and active advocacy groups in the disability community. The discussion below is an overview of some of the topics important to the blind community, but it is by no means the final word on these complex and sometimes controversial topics.

The NFB & ACB

The two largest advocacy groups representing people with blindness and low vision are the National Federation of the Blind (NFB) and the American Council of the Blind (ACB or "The Council"). Both represent strong, vibrant communities of support and advocacy. Although the two groups work together whenever possible, they each have different philosophies about how to focus their efforts.

The National Federation of the Blind advocates that the real problems of blindness are not loss of sight but the unnecessary barriers created by society through lack of awareness and information. They maintain that blindness is not a disabling condition, just an inconvenience, and the real functional issues are the non-accommodating practices of society. The NFB feels it is the responsibility of each individual to assertively challenge society's barriers. NFB members often highly value their ability to live and function independently, without help from others. In general, the NFB is more likely than the ACB to use legal actions and protests to challenge discrimination and other barriers for the blind. This does not mean the NFB is excessive about using protests and legal actions or that the ACB avoids them. There is just a philosophical difference between them over when to choose that approach.

The American Council of the Blind advocates for mutual accommodation between people with blindness and their community. Like the NFB, they value independent living, but they usually pursue it by focusing on individuals accessing community supports instead of insisting on accommodation. The ACB actively advocates for social change, but that change is focused on achieving community integration for people with blindness rather than achieving individual freedom. The ACB is less likely to stage a protest and more likely to propose an investigative committee or lobbying campaign. Some individuals feel the ACB is more accommodating to elderly people with blindness and to the newly blind.

The two groups share many common features. Both actively lobby for new laws, actively file legal actions, and generally advocate for people with blindness at the national and local level. Both have wide-reaching networks of local support groups. Both have outreach and support efforts for people newly experiencing blindness. Both have resources and contacts for assistive technology. Both have national conferences each year. And both have a variety of special-interest groups within their organization, such as people using guide dogs or people using computer technology.

Each group is very passionate in its advocacy efforts, which contributes significantly to their effectiveness but can also lead to occasional heated disagreements between them. It is important

to be aware of the different focus of each and to ask about the relationship between the two groups in your local community.

In addition to the NFB and ACB, there are other important and active groups in blind culture, including the **American Foundation for the Blind** (AFB). Unlike the NFB and ACB, which mostly provide services to their members, the AFB provides service referrals and education resources to anyone with low vision or blindness. The AFB is also very active with rehabilitation professionals interested in vision and has a prominent publishing service. One noteworthy publication is the AFB Directory of Services for Blind and Visually Impaired Persons in the United States and Canada. This comprehensive manual lists all facilities and service providers involved with blindness and low vision. It is available online at the AFB website (www.afb.org), on CD, or as a book.

Blindness and the Law

Many federal regulations specifically single out blindness as distinct from all other disabilities, using language such as "individuals who are blind or disabled". This is a result of early lobbying by advocates for the blind who promoted the concept that blindness was more a characteristic of a person than it was a disability. These advocates felt that separating blindness out from the rest of the disability population would remove some of the stigma and stereotypes of helplessness.

On a practical level, the distinction between people with blindness and people with other disabilities is mostly significant in two areas: Social Security benefits and the Randolph-Sheppard Act. The Social Security Administration (SSA) has several special considerations for people with blindness, but the main two are 1) a higher level of income allowed when applying for eligibility compared to other disabilities, and 2) an additional category of deductions when calculating income to get SSA Work Incentives.

The Randolph Sheppard Act of 1937 provides individuals with blindness priority for owning and operating vending services on federal property. Whenever a new federal facility is built, individuals with blindness have first choice on whether they want to own and operate the vending machines, snack counters, and cafeterias (if any) there. Congress passed the law to increase the opportunities for people with blindness to earn a wage and live independently. In reality, there are two laws, which interact – the Randolph-Sheppard Act and the Business Enterprise Act. Randolph-Sheppard provides the authority for getting first choice. The Business Enterprise Act establishes the organizational system in each state that oversees the allocation and operation of these concessions to qualified individuals. The state agency that provides VR services to the blind usually manages the Business Enterprise Program for that state and is designated as the State Licensing Agency (SLA). The SLA issues formal licenses to blind vendors, designating them as qualified private entrepreneurs under Randolph Sheppard. It also provides them with training and initial coordination, and performs some level of monitoring. All states with a Business Enterprise Program also have an elected committee of blind "vendors" (facility managers) that establishes guidelines, evaluates applicants, and monitors the individual concession operations.

Orientation and Mobility Training

Most "newly blind" individuals get their real introduction to blind culture through training at a residential Orientation and Mobility (O&M) Center. Most states have an O&M center, although it may be privately owned and operated. At O&M centers, individuals learn to use their other senses to read their environment, navigate in the community, and use assistive technologies. Assistive technologies range from canes to computers. Some O&M centers have unofficial affiliations with either the NFB or the ACB. It is useful to ask around about where your state's O&M center is and what affiliations, if any, it has. Sometimes individuals get O&M services in their home without traveling to a special school for an extended stay. There are O&M teachers who travel to a person's community and provide on-site O&M training.

In many cases, people with low vision due to a degenerative condition will go to an O&M center for training before they are legally, functionally, or totally blind. This lets them get the O&M skills in place ahead of time, provides them with a sense of control in the face of decreasing vision, and reduces their anxiety. During the O&M training, they may wear "sleep shades" over their eyes to force them to ignore any residual vision they have (some facilities do this and some do not). After the training, the person can return to their regular life and gradually transition to the O&M skills as needed while still using their residual vision as much as possible.

Incidence Statistics

- Cataract is the leading cause of blindness in American adults.
- By age 40, cataracts significantly affect the vision of one American in six. By age 80, it affects half.
- By age 65 more than half of adults have at least one cataract.
- 90% of the time cataract surgery improves the person's vision.
- More than 1.6 million people age 50 and older have Age-related Macular Degeneration.
- Glaucoma is the third most common cause of blindness worldwide.
- 2.2 million Americans over the age of 40 have glaucoma.
- African Americans over age 40 are at higher risk for Glaucoma.
- 40% of all people with diabetes have diabetic retinopathy.
- 25% of people with juvenile diabetes will have diabetic retinopathy within 5 years of getting diabetes, 60% within 10 years, and 80% within 15 years.
- Each year up to 24,000 more people lose their vision because of diabetic retinopathy.
- Diabetic retinopathy is the leading cause of new cases of blindness for people between the ages of 20 and 75.
- Retinitis Pigmentosa is the most common inherited form of blindness. 100,000 Americans experience it.
- 26% of Americans age 40 and older have myopia (nearsightedness). 10% have hyperopia (farsightedness).

- More than 3 million people have low vision.
- Cytomegalovirus retinitis affect 30% of people with HIV/AIDS.
- People with CMV retinitis have a 25-40% chance of experiencing a retinal detachment.

Possible Functional Issues

Functional issues vary widely for people with low vision and blindness, even more than for most disabilities. A person's functional abilities will depend on the kind and degree of visual impairment they have, the kinds of mobility and orientation training they have gotten, and the kinds of accommodations they use.

- Problem solving and learning skills are usually not affected
- May need extra time to process written documents or documents in alternative formats
- Depth perception may be difficult for people with low vision
- Memory and language skills are usually not affected
- Strength and endurance are usually not affected
- Coordination and dexterity are usually not affected
- Social skills are usually not affected
- May be unable to read facial expressions, body language, eye contact, and other visual social cues
- Organizational and expressive communications skills are usually not affected
- Individuals may have a strong work history and strong motivation to work
- Familiarity with workplace culture is probably strong

Initial Interview Considerations

<u>Initial Questions</u>

- How confident are they with orientation and mobility (travel skills)?
- How much residual vision do they have, if any?
- If they have residual vision, what type of lighting works best for them?
- How stable is their vision?
- What sorts of accommodations do they use at home?
- What hobbies do they have?
- What social activities do they enjoy?

<u>Initial Observations</u>

- How confident does the person seem with orientation and mobility?

Interview Accommodations (if any)

- Do not leave any doors half-open; they should be fully open or fully closed.
- Give very specific directions to your office.
- When the person arrives, address him or her by name and introduce yourself and anyone else who may be in the room.
- Do not touch the person until he or she knows you are there.
- Tell the person if you move somewhere else in the room or if you are leaving the room.
- Tell the person where the chairs and other objects in your office are located.
- If the person has a guide dog, do not pet, talk to, or distract the dog without asking the person's permission.
- If the person has low vision, make sure there is good lighting in your office. However, also check with the person that there is not too much glare from the lighting.
- Have all written material available in large print, Braille (if appropriate), and/or recorded on audiotape.
- Ask the person if they would like printed material in computer/electronic format (assuming you have the materials that way). If you are saving documents this way for them, first simplify any tables and convert any diagrams to paragraph text, then save the file as text only (".txt" extension).
- If you are leading them to another place in your office, ask if they would like to hold your arm or elbow.
- Do not worry about using expressions like "if you see what I mean" and "it looks like." They will not be offended.

Possible Accommodations and Assistive Technology

There are literally hundreds of assistive technology devices for people with various forms of low vision and blindness. The list below provides examples of a few possibilities, but many more ideas are available through some of the online resources listed at the end of this entry.

- Cassette tape recorder
- Talking clocks, calculators, timers, etc.
- A Qualified Reader – a person familiar with any job-related technical language who can read material for the individual
- Personal Braille computer printer or Brailling service (if the person uses Braille)
- A computer with text-to-speech software (screen readers) or screen enlarger software.
- PDA (personal digital assistant - a handheld computer organizer) with speech or Braille output

- Adjustable lighting intensity and a variety of possible light sources (different sources can be different colors – sunlight, fluorescent, incandescent, etc. - and each person with low vision will have their own preferences for color and intensity)
- Adjustable source lighting, such as gooseneck lamps or clip-on lamps
- Pocket flashlight
- Magnifying lenses
- Clocks, telephones, calculators, etc. with large numbers, buttons, and displays
- Prescription sunglasses ("Absorptive Lenses")
- Photocopier with enlargement feature
- Writing tablets with bold lines or raised lines
- Boldly colored tape to mark edges of steps, edges of desks, etc.
- Tape or strips of different textures for tactile marking
- Large print or Braille labels to go on drawers, folders, bookcases, etc.
- Visor to block out glare from sky
- No reflective desktops or other surfaces
- Talking money identifier or talking cash register
- Telephone light sensor – monitors face of telephone and vibrates if a line is lit or flashing
- Low vision assessment, if individual is not familiar with the various low vision aid options

Career Planning Issues

- People with low vision or blindness continually find ways to succeed in a wide variety of careers, so it is important to keep an open mind. With the right supports, there are very few careers closed to them. Job shadowing or a VR-paid apprenticeship may be a useful way for someone to test the waters of a demanding career choice.
- Stability of vision is an important career issue. Support plans should be in place ahead of time if the person expects his or her residual vision to decrease.
- Not all computer software used in the workplace is as accessible as advertised. The person needs a chance to try out the features of any software needed on the job. As computer software and technology change in the future, the person may need to return to VR for help getting compatible assistive technology.
- The person needs to be aware of all the resources available through independent living centers, advocacy groups, and federal programs like social security.

Emerging Issues

- Accessibility problems with new computer technology and the World Wide Web.
- Revival of the use of Braille, proposed changes in the Braille alphabet.
- Veto authority for state elected committees of blind vendors over state VR agency Randolph Sheppard decisions.

Additional Information Resources

- National Federation of the Blind - www.nfb.org
- American Council of the Blind – www.acb.org
- American Foundation for the Blind – www.afb.org
- National Industries for the Blind: coordinates a group of associated companies that actively hire the blind and provide products to the US government – www.nib.org
- Foundations of Rehabilitation Counseling with Persons Who Are Blind or Visually Impaired, edited by J. Elton Moore, William H. Graves, & Jeanne Bolan Patterson – a text from AFB Press, available through the AFB website
- National Association for the Visually Handicapped: a low-vision advocacy group - www.navh.org
- Association for Education and Rehabilitation of the Blind and Visually Impaired (AER): for professionals providing support to people with blindness and low vision - www.aerbvi.org
- Lighthouse International: vision rehabilitation, education, research, and resources - www.lighthouse.org
- Sharing Solutions: a newsletter for people with vision disorders and their support networks - www.lighthouse.org/sharing_solutions_main
- National Eye Institute: descriptions of different vision disorders - www.nei.nih.gov
- American Academy of Ophthalmology: articles on a large range of treatment research topics - www.eyenet.org
- American Optometric Association - www.aoanet.org
- Ocular Times: very good descriptions and illustrations of many eye disorders – www.OcularTimes.com
- Hot Braille: a website of discussion groups and communications resources, including a free service letting you type a letter to a blind person, which they will print in Braille and mail for you - www.hotbraille.com/index.asp
- Blind Babies Foundation Fact Sheet: provides background material on congenital vision disorders not usually discussed in other websites - www.blindbabies.org/fact_sheet.htm
- Retina International: information on macular degeneration, retinitis pigmentosa, and other retina diseases - www.retina-international.org

- The Glaucoma Foundation - www.glaucomafoundation.org
- The Macular Degeneration Partnership – www.amd.org
- American Diabetes Association – www.diabetes.org
- National Diabetes Information Clearinghouse – www.niddk.nih.gov/health/diabetes/ndic.htm
- AIDS Education Global Information System (AEGIS) – www.aegis.com
- The Rehabilitation Research and Training Center (RRTC) on Blindness and Low Vision - www.blind.msstate.edu
- Job Accommodation Network's Accommodation Ideas Director - www.jan.wvu.edu/media/ideas.html
- National Rehabilitation Information Center (NARIC) – not just vision - www.naric.com