

GUIDANCE HANDBOOK

Visual Impairment Including Blindness



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Special Education

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APPENDIX A: EYE CONDITIONS

The eye conditions defined below are adapted and borrowed from the [Texas School for the Blind and Visually Impaired, Specific Eye Conditions, Corresponding Impact on Vision, and Related Education Considerations](#) (January 2015). [Creative Commons Attribution – Non-Commercial 4.0 International License](#).

Achromotopsia. (color deficiency, colorblindness, achromacy, or rod achromacy) Cone malformation, macular deficiency, and partial or total absence of cones.

Albinism. Total or partial absence of pigment, causing abnormal optic nerve development. Lenses and tinted lenses may be prescribed.

Amblyopia. (previously known as Anopsia, called “lazy eye;” See strabismus) Reduced visual functioning in one eye, which causes the person to use one eye instead of both. With young children, eye exercises, occlusion or patching of one eye or surgery may help.

Aniridia. A rare genetic disorder that causes absence of all or part of the iris, usually affecting both eyes. It also causes the cornea to lose clarity over time by inhibiting the stem cells that “refresh” it with new, clear epithelial cells. Aniridia is often associated with amblyopia, cataracts, the development of closed angle glaucoma, and sometimes, displaced lens, under-developed retina, and nystagmus. Contact lenses with an artificial iris, tinted spectacles, or bioptic glasses may be prescribed. Iris and stem cell implant surgeries are now possible. Hereditary aniridia is associated with Gillespie syndrome. Sporadic Aniridia may cause nephroblastoma (Wilm’s tumor), and it is associated with WAGR syndrome.

Anophthalmia. Absence of one or both eyeballs. Causes can be heredity, injury, or secondary to disease. Prosthetic eyes are prescribed to preserve the health of the eyelids and surrounding tissues.

Aphakia. Absence of the lens. Although it can be caused by injury, aphakia is usually a result of cataract surgery. Treatments include lens implants, contact lenses, and/or glasses.

Astigmatism. Irregularity in the curvature of the cornea and/or lens, which prevents light rays from being properly focused on a single point on the retina. Astigmatism commonly occurs with myopia and hyperopia. It also can be associated with albinism and keratoconus. Corrective lenses may be prescribed.

Buphthalmos. (Infantile glaucoma) Enlarged eyeballs. Caused by congenital glaucoma; hereditary; onset from birth to three years; can cause enlargement and increased depth of the anterior chamber, damage to the optic disc, and/or increased diameter and thinning of the cornea; requires surgery, and blindness occurs if left untreated.

Cataracts. Opacity or cloudiness of the lens, which restricts passage of light to the retina; usually bilateral. Opacity increases over time until “mature” cataracts can obscure the fundus and the pupil may appear white. Mature cataracts are usually removed surgically, requiring lens implants or contact lenses.

Chorioretinitis. Posterior uveitis, or an inflammation of the choroid that spreads to the retina. This can be caused by tuberculosis, histoplasmosis, or toxoplasmosis.

Coloboma. Hereditary birth defect that causes a notch or cleft in the pupil, iris, ciliary body, lens, retina, choroid, or optic nerve. A “keyhole” pupil often occurs. It can be associated with refractive error, cataracts, nystagmus, strabismus, and glaucoma, later in life.

Convergence Insufficiency. Vergence eye movements are responsible for turning the eyes in toward one another (convergence) while viewing near objects and turning them out away from one another (divergence) while viewing distant objects. These eye teaming skills are important for dynamic activities such as copying notes from the board, driving or playing ball sports. They are also necessary for prolonged activities such as reading and working at the computer. When the eyes don't work as a team, convergence insufficiency can result in eye fatigue, blurred vision and possible double vision.

Corneal Ulcers, Corneal Opacities, Corneal Scarring, Keratitis, and Interstitial Keratitis. An open sore or scarring on any part of the cornea. It can be caused by bacteria, viruses (herpes), fungi, vitamin deficiency, injury, a hypersensitive reaction, diabetes, or severe dry eye. Superficial ulcers (called abrasions) usually heal quickly and completely, but deep ulcers cause growth of scar tissue or new blood vessels that impair vision. Corneal ulcers are usually quite painful, and other symptoms may include vision loss, squinting, and tearing (watering). Early diagnosis and treatment are crucial. With extensive scarring, a corneal transplant may be necessary. There are promising results with use of artificial corneas, which seem to be less likely to be rejected.

Cortical Visual Impairment (CVI). A neurological visual disorder resulting from damage to the optic nerve and/or parts of the brain that process and interpret visual information (i.e., visual cortex). CVI is characterized by the following.

- Specific color preference, especially for red and/or yellow
- Attraction to movement
- Visual field preference, especially for peripheral fields
- Visual latency: delayed visual processing - in directing gaze, identification, recognition, and/or discrimination
- Difficulties with discrimination and interpretation of complex visual information
- Poor visual attention

- Atypical visual responses (e.g., looking at something while appearing not to look)
- May not look at an object and reach for it simultaneously (look first, then look away while reaching)
- Better visual performance with familiar objects/settings
- Unique visual features (i.e., light gazing and non-purposeful gaze)

Diabetic Retinopathy. Changes in the blood vessels of the retina, causing hemorrhaging in the retina and vitreous. It is caused by juvenile or type 2 diabetes. It may lead to retinal detachment and blindness.

Diplopia. Muscular defect that restricts the ability of the eyes to work together. It causes double vision, as the image from one eye is imposed on the image from the other eye. Left untreated, this condition can develop into amblyopia. Corrective lenses may be prescribed.

Dislocated Lens. The lens is not in its natural position. It is sometimes associated with coloboma, Marfan’s syndrome, or Marchesani’s syndrome. Also, it may be associated with diplopia or cataracts.

Enucleation. The anterior chamber or the entire eyeball is surgically removed from the orbit (eye socket). Prosthetic eyes or scleral shells are usually recommended.

Esophoria, Esotropia, Exophoria, and Exotropia. (See “strabismus”)

Glaucoma. An eye disease which causes increased pressure in the eye because of blockage in the normal flow of the fluid in the aqueous humor. Causes include changes in the lens or uveal tract, trauma, reaction to a medication, surgical procedures, and heredity. Eye pain and headaches are associated with glaucoma. Prescription eye drops to reduce pressure must be used regularly, and surgery may be necessary. Untreated, glaucoma can lead to degeneration of the optic disk and blindness.

Hemianopia (hemianopsia). Blindness or impaired vision in one half of the visual field in one or both eyes. If both eyes are affected, vision loss may occur on the same side in both nasal fields, or in both temporal fields. Visual acuity in the unaffected field(s) remains unchanged. Hemianopia can be caused by stroke, other brain trauma, tumors, infection, or surgery.

Hyperopia (Farsightedness). A refractive error in which the focal point for light rays is behind the retina. It is caused by the eyeball being too short from front to back. Corrective lenses are usually prescribed.

Keratoconus (KC). Degenerative disorder in which the cornea thins and takes on a conical shape. Keratoconus is often bilateral but not symmetrical, so vision may be significantly better in one eye than the other. Vision deteriorates at varying rates (sometimes quite rapidly), and plateaus of stable vision can occur. Although it seems to be hereditary, keratoconus is typically diagnosed in adolescence. It is sometimes associated with retinitis pigmentosa, Down's syndrome, Marfan's syndrome, and aniridia. Treatments include prescription lenses and various surgeries: intrastromal corneal ring segments, cross-linking, mini asymmetrical radial keratotomy, and corneal transplants. There are promising results in transplants with use of artificial corneas, which seem to be less likely to be rejected.

Leber's Congenital Amaurosis (LCA, Leber's Congenital Amaurosis). A rare hereditary disorder that leads to degeneration of the macula. LCA becomes evident within the first few months of life. Progressive central field loss can occur, although vision is generally stable. LCA is a subset of retinitis pigmentosa with at least thirteen described types that are distinguished by genetic cause, patterns of vision loss, and associated eye conditions. Nystagmus, keratoconus, photophobia, extreme hyperopia, and sluggish (or absent) pupillary response to light are often present with LCA. Excessive rubbing of eyes (also poking or pressing) is a characteristic behavior.

Macular Degeneration (Macular Disease, Congenital Macular Disease, and Age-Related Macular Degeneration). Progressive (degenerating) damage to the central part of the retinal cones. The dry form involves yellow deposits (cellular debris) on the macula and eventually, thinning of cells in the macula, which leads to tissue death. In the wet form, there is abnormal growth of blood vessels in the choroid underneath the macula. These blood vessels leak blood and fluid into the retina, causing distortion, blind spots, loss of central vision, retinal scarring, and risk of retinal detachment. Macular degeneration is the leading cause of blindness in people over sixty, but it also can occur in children below age seven. Factors contributing to the development of the disease include heredity, diabetes, head injury, nutritional deficits, high cholesterol, smoking, and exposure to sunlight without eye protection. There is no cure, but treatment can slow progress of the disease. Treatments include nutritional supplements, laser therapy, and medication.

Microphthalmia (Microphthalmos, nanophthalmia, nanophthalmos). A hereditary, developmental disorder that causes one or both eyes to be abnormally small. It may occur with other congenital abnormalities such as clubfoot, additional fingers or toes, webbed digits, polycystic kidneys, and cystic liver. This disorder can be associated with

Patau Syndrome, Triploid Syndrome, or Wolf-Hirschhorn Syndrome. It may result in cataracts, glaucoma, aniridia, and coloboma.

Myopia (Simple and Degenerative Myopia, nearsightedness). A refractive error in which the image of a distant object is formed in front of the retina and cannot be seen distinctly; eyeball is elongated from front to back. Degenerative myopia is progressive, causing increasingly severe nearsightedness, so that visual acuity often cannot be corrected to normal with lenses. It can lead to retinal detachment, choroidal hemorrhages, reduced central vision, opacities in the vitreous, macular swelling, and cataracts. Treatments include corrective lenses and LASIC surgery.

Nystagmus. Involuntary eye movements, which can be horizontal, vertical, circular, or mixed. Causes can be heredity, neurological disorders, toxicity, pharmaceutical drugs, alcohol, inner ear disturbance, or unknown. Nystagmus can be increased by stress, spinning, and rhythmic movements.

Optic Atrophy (Optic Nerve Atrophy). Hereditary or acquired damage to the optic nerve that limits or stops transmission of visual information from the eye to the brain. It is evidenced by a pale optic disc and reduced pupillary response. Acquired optic atrophy can be caused by disease, pressure on the optic nerve, trauma, glaucoma, or toxicity. Type 1 optic atrophy is progressive.

Optic Nerve Hypoplasia (ONH). ONH and Septo-Optic Dysplasia (SOD) are related disorders of early brain development. ONH is a congenital, non-progressive condition in which the optic nerve is under-developed and small. It may affect one or both eyes, and when both are affected, side-to-side nystagmus is frequently present. During the first few years of life, vision may improve as the brain continues to develop. The incidence of strabismus is increased with ONH. It is one of the three defining characteristics of Septo-Optic Dysplasia, which is also called DeMorsier's Syndrome. Learning disability, autism, cerebral palsy, and intellectual developmental delays can occur with ONH and SOD. Possible causes include young maternal age, genetic mutation, fetal alcohol syndrome, trauma, and viral infection.

Photophobia. Abnormal sensitivity to any type of light. It is usually associated with an eye disease or disorder (e.g., iritis, ocular albinism, aphakia, aniridia, dislocated lens, cataracts, glaucoma, etc.). However, many people experience mild photophobia that is unrelated to another eye condition. Other causes include corneal inflammation, some medications, and eye injuries. Severe photophobia can be quite painful, even in relatively dim light.

Presbyopia. The gradual loss of flexibility of the lens that occurs with age. It results in an inability of the eye to focus at near distance. Presbyopia generally begins to noticeably affect visual functioning around age 40, and people often need prescription lenses by age 45. Options for prescription lenses include glasses for near-distance tasks, bifocals, transition lenses, and monovision contact lenses. Vision also can be corrected by reshaping the cornea using lasers (LASIK), radio waves (conductive keratoplasty - CK), or gas bubbles (IntraCor). Other surgical treatments include artificial lens implants, corneal inlays, and corneal overlays.

Ptosis. Drooping (sagging) of the eyelid. It may affect upper and/or lower lids and one or both eyes. Ptosis is usually due to weakness of the muscles that control the eyelids, damage to the nerves that control these muscles, or very loose skin of the upper eyelids. Commonly associated with the aging process, ptosis also can be congenital and hereditary, or caused by injury or disease. A ptosis crutch may be prescribed to elevate the eyelid. Medications may be prescribed for those who have myasthenias gravis. Children with severe ptosis need eyelid lift surgery early in life to insure normal visual development and to prevent amblyopia.

Retinal Detachment. An emergency situation in which parts of the retina pull away from the underlying tissue that nourishes it and from the supporting structure of the eye. Detachments can be repaired if treated within 24-72 hours, but detached parts deteriorate rapidly. Any detachment endangers the entire retina. Detachments are caused by retinal tears, fluid under it, or shrinkage of the vitreous. These conditions may be due to injury, inflammatory eye disorders, advanced diabetes, degenerative myopia, and other retinal disorders.

Retinitis Pigmentosa (RP). A group of hereditary disorders causing degeneration of the retina. It is characterized by progressive loss of vision and reduction of visual fields, usually from the periphery inward. However, in some cases, central vision is affected first. RP may be associated with Usher's syndrome, Leber congenital amaurosis, Laurence-Moon Biedl, and Bassen-Kornzweig syndrome.

Retinoblastoma. A rare type of cancer in which malignant cells grow in the retina. It usually develops in early childhood. The majority of children who develop this cancer have mutations only in eye cells (non-germinal). They will not pass on the mutation, and usually, retinoblastoma develops only in one eye. When the mutation occurs in all body cells (germinal retinoblastoma), the disease is hereditary. These children are more likely to develop retinoblastoma in both eyes, pineal brain tumors (trilateral retinoblastoma), and other forms of cancer anywhere in the body. Current treatments include surgery,

radiation, and chemotherapy. Retinoblastoma can become life threatening if the tumor extends beyond the eye, so enucleation is frequently necessary.

Retinopathy of Prematurity (ROP, retrolental Fibroplasia). Incomplete development of the blood vessels of the retina. It occurs in premature infants. The vessels also may grow abnormally from the retina into the back of the eye. They may bleed into the eye, scar tissue may develop, and retinal detachment may occur. The major risk factors are degree of prematurity and low birth weight. There are five stages of ROP, ranging from mildly abnormal blood vessel growth in stage one to retinal detachment in stage five. ROP may be associated with other issues caused by incomplete development. Lasers or freezing (photocoagulation and cryotherapy) may be used to stop the abnormal blood vessels from continuing to grow. Also, surgery may be done to reattach the retina.

Scotoma (pl. scotomata, scotomas). A portion of the visual field that is blind or partially blind and surrounded by relatively normal vision, depending on the presence of other eye conditions. Scotomas can occur in any part of the visual field. They can be caused by retinal disorders, tumors, stroke, or traumatic brain injury.

Strabismus (muscle imbalance). Abnormal alignment of the eyes; an inability to look at the same point in space with both eyes at the same time. It can be caused by a defect in the extra-ocular muscles or in the part of the brain that controls eye movement. It can be hereditary, and it may be associated with brain tumors, cerebral palsy, Down syndrome, extreme farsightedness, cataracts, or having much better vision in one eye than in the other. Strabismus includes:

- Phorias – muscle imbalances that are controlled by the brain's efforts toward binocular vision. Not always present, they tend to manifest when the person is tired.
- Tropias – observable deviations that the brain cannot resolve. They are always present.
- Eso – turned inward/nasal (esophoria and esotropia)
- Exo – turned outward/temporal (exophoria and exotropia)
- Hyper – turned upward (hyperphoria and hypertropia)
- Hypo – turned downward (hypophoria and hypotropia)

Treatments can be effective for young children: eye exercises, occlusion of the better eye, medications, and surgery. Prismatic glasses may be prescribed to increase field of vision.

Toxoplasmosis. Congenital or acquired inflammation of the retina and choroid (retinochoroiditis), which can cause retinal scarring. Toxoplasmosis is caused by infection with the toxoplasma parasite found in animal feces and unpasteurized milk.

Unborn babies are most vulnerable to the infection, and it can cause damage to the brain, eyes, or other organs. Treatments include anti-inflammatory medications, photocoagulation (laser) therapy, and cryotherapy (freezing).

Trachoma. A contagious bacterial infection of the eyes and eyelids, causing scarring and buckling of the eyelids. This causes the eyelashes to turn under, which leads to corneal scarring. Repeated and prolonged infection causes permanent visual impairment and blindness. Trachoma is spread through direct contact with secretions from the eyes, eyelids, or nose of an infected person. It is the leading cause of preventable blindness worldwide.

Uveitis. Inflammation of the uveal tract (middle layer of the eye), which consists of the iris, choroid, and ciliary body. The most common form affects the iris, and it may be called anterior uveitis or iritis. The cause may be unknown. Known causes include autoimmune disorders, infection, toxoplasmosis, tuberculosis, and histoplasmosis. Complications can cause glaucoma and damage to the retina or cornea, leading to permanent vision loss.

APPENDIX B: THE EXPANDED CORE CURRICULUM

The following information regarding the Expanded Core Curriculum (ECC) for students with visual impairments is adapted from a flyer published by the Texas School for the Blind and Visually Impaired entitled: [What is the Expanded Core Curriculum?](#)

Assistive Technology Skills

Assistive technology (AT) allows students who are blind or visual impaired to access the general curriculum, increase literacy options, and enhance communication. A variety of high- and low-tech assistive technology tools and software has been designed specifically for learners with visual impairments who require specialized instruction.

These devices/software include, but are not limited to:

- Electronic braille notetakers;
- Colored transparencies;
- Tactile symbols;
- Calendar systems;
- Video magnifiers;
- Screen reader software;
- Screen enlarging software;
- Braille displays;
- Auditory access to printed materials; and
- Magnification devices.

Compensatory Skills

Compensatory skills are needed to access the general curriculum. This includes learning experiences such as concept development, spatial understanding, study and organizational skills, speaking and listening skills, and any adaptations necessary for accessing all areas of the existing core curriculum, to include access to printed materials. Examples include: Braille, abacus, talking books, digital calendar for assignments, etc.

A student's communication needs vary depending on the degree of functional vision, effects of additional disabilities, and the task to be completed. Learners with deaf-blindness and other disabilities may use alternative communication systems such as tactile sign language, symbol or object communication, augmentative communication devices, or calendar boxes.

Specialized instruction in concept development may be of significant importance when visual observation is limited. These learners benefit from instruction offered with specific and sequential hands-on, sensory-based lessons to build a broad base of experiences. In the higher

grades, many mathematical, geographical, and scientific concepts must be taught with adapted materials and strategies for students who are unable to learn from pictures and visual diagrams. **A learner with little or no vision may have fragmented understandings of the world without systematic tactile exploration and clear, verbal explanations.** Some concepts are fully visual, such as colors, rainbows, clouds, and the sky. Some are too large to experience completely, such as buildings, mountain ranges, and oceans. Other items are too tiny or too delicate to understand through touch, including small insects, a snowflake, or an item under a microscope. Some items are inappropriate to explore through touch such as wild animals or toxic substances. Due to these challenges with direct exploration, the resulting fragmented concepts can impede social, academic, and vocational development.

Learners with visual impairments need systematic instruction to learn efficient use of their senses. Instruction in visual efficiency must be individually designed and may include:

- Using visual gaze to make choices;
- Tracking car movements when crossing the street;
- Responding to visual cues in the environment; and/or
- Using optical devices, such as magnifiers and telescopes.

For most learners with visual impairments, an increased reliance on tactual skills is essential for learning and should be considered as part of IEP development. A concept that may be readily captured at a glance by a sighted student, such as relative size, may require more detailed hands-on interaction and repetition to be tactually understood by a learner who is blind or visually impaired.

Systematic instruction in auditory skills may be needed for successful mobility and to help students learn to effectively use their hearing to respond effectively to social cues, travel safely in schools and across streets, learn from recorded media, and use echolocation (the use of sound waves and echoes to determine where objects are in space) for orientation.

Career Education

Learners with visual impairments learn about work and career options through parents, friends, community members, and, more formally, through the secondary transition process at school. Opportunities to explore their strengths and interests in a systematic, well-planned manner are provided through the IEP process.

Career exploration and subsequent training may include:

- Acquisition of specialized skills and equipment;
- Understanding how to request and develop natural supports in the workplace; and
- Understanding how to compete in the job market.

Learners who are well prepared for a wide range of vocational choices and the adaptations, including technological devices that make them attainable are more likely to experience a successful transition from school to work. It is important to provide learners with visual impairments with opportunities to job shadow to gain concrete experiences of various career choices and to learn about other persons with visual impairments who have successful vocational outcomes.

Recreation and Leisure Skills

Providing students with opportunities to experience recreation and leisure activities as children can have positive impacts throughout their lives and encourage participation in sports, playing games with friends, and joining clubs. IEP team members and community members can share options or possible adaptations that would allow learners with visual impairments to participate in these activities. Such skills include both individual and organized group activities for students at all ages and levels.

Orientation and Mobility

Orientation and mobility is sequential instruction that is essential for individuals with visual impairments to use their remaining senses to determine their position in space within the environment and develop techniques for safe movement from one place to another. These skills are taught by a Certified Orientation and Mobility Specialist (COMS).

Instructional skills include, but are not limited to:

- Concept development (body image, spatial, temporal, positional, directional, and environmental);
- Sensory and motor development;
- Use of residual vision and low-vision devices;
- Human (sighted) guide techniques;
- Cane techniques;
- Route planning;
- Problem-solving skills;
- Techniques for crossing streets; and
- Use of public transportation.

Orientation and mobility instructors work in center-based, school, and itinerant situations. They are frequently called upon to assist public transportation authorities in environmental management planning, such as alleviation of dangers caused by complex road patterns (e.g., traffic circles, multiple street intersections) and selective installation of audible pedestrian signals.

Social Interaction Skills

Nearly all social skills are learned through observing people interacting with each other. While a small part of these interactions can be experienced auditorially, the majority of social exchanges are visual observational experiences. As a result, many social skills that sighted individuals observe and imitate may need to be explicitly taught to a youth with a visual impairment. Social interaction skills include personal space, facial expressions, gestures, turn taking, and body language. Lack of access to visual information as a result of a visual impairment can cause a student to feel socially isolated, impede typical social interactions, or limit social skill development. A learner with a visual impairment who cannot see facial expressions and subtle body language may be hesitant to participate in conversations and activities or experience awkward and confusing interactions when they do participate without the benefit of full access to the visual information of the interaction and the environment. Explicitly teaching appropriate social skills can lead to successful social interactions, development of meaningful friendships, and community membership. A speech-language pathologist can provide direct service for students and consultative services for team members who implement strategies across all environments.

Sensory Efficiency

Sensory efficiency includes instruction in the use of residual vision, hearing, and the other senses, such as learning how to support the use of optical devices, hearing aids, augmentative communication devices, and similar items to support student independence. By learning to use their senses efficiently, students with visual impairments are able to access and participate in their environments.

Self-Determination

Self-determination includes:

- Personal decision-making;
- Self-advocacy; and
- Assertiveness based on an understanding of one's abilities and related needs.

These skills lead to competence, as opposed to learned helplessness, and are important components of positive self-esteem. Specialized instruction in developing self-determination skills can help students participate meaningfully in their educational and transition planning and make positive adult lifestyle, job, and other life choices upon graduation.

Independent Living Skills

Generally, young children learn basic skills in independent living through visual observation and imitation. However, most learners with visual impairments need systematic instruction and adaptations to use standard equipment, such as modifications to read oven markings, in order to cook independently and safely.

Depending on the student's level of vision, intellectual ability, and other unique characteristics, adaptations may address areas such:

- Minor highlighting and tactile clues for matching clothing;
- Cooking food;
- Grooming and hygiene;
- Cleaning one's living environments; and/or
- Preparing to live on one's own.

These skills are not typically evaluated or taught in a sequential and systematic basis in general education settings. Family members may require assistance and guidance to implement the proper adaptations that will permit practice and mastery of new independent skills within the home.

Successful transition from school to independent living and employment requires the development of such critical skills as:

- Home living
- Self-determination
- Vocational
- Community access
- Money management
- Interpersonal/social

Ongoing assessment of each of the Extended Core Curriculum (ECC) areas is critical for measuring success and ensuring independence. Instructional needs in the ECC areas can be addressed using a variety of service delivery environments including instruction occurring more often in the classroom, outside of the classroom throughout the school environment, or in the community for vocational programming. Collaboration between professionals will ensure comprehensive services.