

V I B R A T I O N S

NEWSLETTER OF COLORADO SERVICES FOR CHILDREN WHO ARE DEAFBLIND

Serving Children with Vision and Hearing Loss, Their Families, and Service Providers

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This is an edited version of the original newsletter. Only the articles pertinent to visual impairments have been maintained as resource information. If you copy any of this information, please give credit to its original source.

CONDITIONS WHICH HAVE A SIGNIFICANT ASSOCIATION OF VISUAL PROBLEMS OR VISUAL IMPAIRMENT

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CEREBRAL PALSY

Background Information: Over 50 - 75% of children with cerebral palsy have some form of a visual problem or impairment. In general, children with cerebral palsy have a high incidence of nearsightedness, visual field loss, and strabismus. *Farsightedness* is more prevalent with children who have athetoid cerebral palsy. Twenty-five per cent of the children with spastic cerebral palsy have a visual field loss. Children with low postural tone may have more difficulty with distal eye movements. *Strabismus* (eyes that cross or are not aligned) is also a common visual concern. Depending on the status of neurological impairment, the child may also have a diagnosis of *cortical visual impairment (CVI)*.

Functional Vision Implications: Visual field loss, eye movement problems, and difficulty with visual concentration and/or eye-hand skills may be evident due to motor problems of the body. For example, the child may be expending the majority of his energy just keeping his body aligned or upright against gravity, so there is minimal opportunity to direct his energy into tasks requiring visual concentration.

If the child is *myopic* (nearsighted), he or she will demonstrate some level of poor distance vision. Near vision is typically not affected, but the focal range of uncompromised near vision is variable depending on the amount of nearsightedness. *Strabismus* (eyes that cross or are not aligned) effects binocular vision, which results in poor depth perception and general eye movement skill refinement. Reduced visual field may occur with a tropic condition. Eyestrain is probable due to poor eye movement control. If not corrected, *amblyopia* (lazy eye) may occur. Hallmark features of *cortical visual impairment* include the fluctuation of vision, delayed visual responsiveness, difficulty deciphering figure/ground information, and visual processing problems. Children with cortical visual impairment often have visual field loss.

CYTOMEGALOVIRUS (CMV)

Background Information: Cytomegalovirus is a form of the herpes virus. It is typically not a dangerous virus unless a pregnant woman contracts the virus and does not have adequate antibodies. It infects one per cent of all newborns and 90% of these children will develop normally. The remaining 10% may have neurological damage that may cause hearing loss, visual impairment, motor impairment, and/or developmental delay. There may be a progressive hearing loss.

Functional Vision Implications: Visual impairment can be caused by *chorioretinitis* (on the choroid and retina of the eye) *scars*, which may result in "blind spots." *Microphthalmia* (small eyes), *cataracts* (clouding of the lens of the eye), and/or *optic nerve problems* may cause light sensitivity and reduced acuity. Functional implications of cortical visual impairment have been described.

DOWN SYNDROME

Background Information: Children who have Down syndrome are at risk for visual problems, although actual legal blindness is not common. Sixty percent of children with Down syndrome have a significant refractive error and will require prescriptive glasses. A significant number of children with Down syndrome are highly nearsighted. Twenty percent have *strabismus* (eyes that are not equally aligned). *Congenital motor nystagmus* (involuntary movement of the eyes) also has a small statistical prevalence. A small percentage of children with Down syndrome are born with *cataracts* (clouding of the lens of the eye). The use of atropine with children who have Down syndrome is contraindicated due to its tendency to exacerbate pre-existing neurological problems. Atropine is used to dilate the eyes during eye examinations.

Functional Vision Implications: In the event of *hyperopia* (farsightedness), near vision will be affected without the benefit of glasses or contact lenses. For some children who have a significant amount of farsightedness, a strabismic (eye crossing) condition may occur due to an over-convergence response to close range fixation. If the child is *myopic* (nearsighted), he or she will demonstrate some level of poor distance vision. Near vision is typically not affected, but the focal range of uncompromised near vision is variable depending on the amount of myopia. *Strabismus* has been previously described in the section under cerebral palsy.

Individuals with nystagmus have reduced acuity and difficulty maintaining fixation, especially with the sustained effort of visual concentration tasks. Distance vision, eye movement coordination, and "visual endurance" are influenced by nystagmus. Generally, individuals with *congenital motor nystagmus* can achieve a "null point", or a position where random eye movement is either reduced or stilled. Head and/or eye movement, particularly eye movement to the extreme end of the lateral gaze, may facilitate localization of the null point. Due to the awkwardness of some extreme head or eye turns, a child may be limited to short-term use of the null point for critical viewing.

The presence or formation of a *cataract* will result in a loss of visual acuity and possible visual field constriction. The extent of the acuity and visual field loss will depend on the size, position, and density of the cataract. In addition, nystagmus, strabismus, refractive error, amblyopia, light sensitivity, and sensitivity to glare are frequently associated with congenital cataracts. Following the removal of a cataract and the introduction of some form of a corrective lens, there is a range of visual performance potential including relatively normal vision to legal blindness. Early detection and treatment is important.

FETAL ALCOHOL SYNDROME (FAS)

Background Information: It has been estimated that one out of every two children with the diagnosis of FAS has some form of visual problem or impairment. Visual problems include *ptosis* (drooping eyelid), *refractive error* (nearsighted or farsighted), and *strabismus*. Visual impairment conditions include *optic*

nerve hypoplasia (underdeveloped optic nerves), *microphthalmia* (small eyes), and *ptosis*. Ptosis is a concern if the eyelid occludes the pupil and *amblyopia* (lazy eye) occurs as a result of visual deprivation to the eye.

Functional Vision Implications: Implications of hyperopia were reviewed in the section on Down syndrome. Myopia and strabismus were discussed in the section on cerebral palsy of this article.

Optic nerve hypoplasia and/or *microphthalmia* may cause severe to moderate visual acuity loss. Visual field defects including "blind spots" and hemianopsia (loss of half of the visual field) have also been noted

DEAF/HARD OF HEARING

Background Information: It is estimated that 60% of children who are deaf/hard of hearing have some form of a visual problem. The most common problems are *refractive errors* (need for glasses) and/or *strabismus*. There is a low incidence of *congenital cataracts* and *glaucoma*. Specific high-risk populations include children with rubella, Usher syndrome, CMV, or post-meningitis.

Functional Vision Implications: *Hyperopia*, *myopia*, *strabismus*, and *cataracts* have been previously reviewed.

Symptoms of uncontrolled *infantile glaucoma* include excessive tearing, photophobia, and blepharospasms (spasms of the eyelids). Surgical intervention is the treatment of choice in many cases of infantile glaucoma. Because the human eye is only stretchable until the age of three, the onset of glaucoma after this age does not result in bupthalmus, but follows the typical course of adult glaucoma. In the early stages of adult glaucoma, functional signs of visual impairment may not be demonstrated. In advanced glaucoma, several symptoms such as poor night vision, light sensitivity, lens opacity and restricted fields are typical. Decrease in visual acuity is dependent on the amount of tissue damage. Decreased visual acuity may also cause difficulty with reading. In rare instances, a child may experience an acute glaucoma attack. Common symptoms are nausea, redness of the eye, hazy cornea, headache and extreme pain. Permanent visual loss, tissue damage or blindness can result in a few days without early medical treatment.

Key characteristics of *retinitis pigmentosa*, the eye condition associated with Ushers Syndrome, include the degeneration of the rods (receptors in the peripheral retina). The result is a gradual loss of peripheral vision and night vision. The child with advanced retinitis pigmentosa may exhibit difficulty with mobility and in adapting to different lighting situations, (e.g., moving from outdoor to indoor lighting). With retinitis pigmentosa, the child's visual acuity is generally within normal ranges unless other complications occur affecting the macular area. Some children may have inverse or atypical retinitis pigmentosa with macular or central retinal involvement, resulting in ring-like or "donut" shaped fields of view. This macular involvement also affects reading ability and color discrimination. The restricted visual field and the use of safety glasses should be discussed.

MENINGITIS

Background Information: Meningitis is a life threatening postnatal infection of the brain and spinal cord. It can cause high fever, convulsions, coma, and death. Complications from meningitis include seizures, paralysis, hearing loss, visual loss, mental retardation and death. If damage has been done to the visual cortex or posterior visual pathways due to the high fevers associated with meningitis, cortical visual impairment may occur.

Functional Vision Implications: Hallmark features of *cortical visual impairment* include the fluctuation of vision, delayed visual responsiveness, difficulty deciphering figure/ground information, and difficulty sorting visual information. Visual field loss is common.

PREMATURITY - RETINOPATHY OF PREMATURITY (ROP)

Formerly called Retrolental Fibroplasia or RLF

Background Information: Retinopathy of Prematurity (ROP) is a leading cause of pediatric blindness in the United States. It is a retinal condition seen in some premature infants. When an infant is born too early, the retinal vascular system may fail to develop normally. This results in the proliferation of new blood vessels, as well as the development of fibrous tissue through the retina and vitreous. These new blood vessels and fibrous tissue cause stretching of the retina and may lead to retinal detachment. ROP is usually a bilateral (both eyes) condition and the severity of damage is dependent upon a number of variables, the most conclusive one being low birth weight.

Functional Vision Implications: Visual damage may range from poor macular development to complete *retinal detachment*. The level of visual acuity and possible visual field loss varies and is determined by the severity of the condition. Conditions commonly associated with ROP are *corneal scarring*, *high myopia*, *nystagmus*, *strabismus*, and partial or complete retinal detachment. Possible secondary conditions are *glaucoma* and *cataracts*.

TORCH

Background Information: **T**Oxoplasmosis has associations of *chorioretinal scarring* at birth, *strabismus*, and *nystagmus*. **R**ubella has been linked with *pigmentary retinopathy*, *cataracts*, *microphthalmia*, *optic atrophy*, *nystagmus*, and *glaucoma*. **C**ytomegalovirus may result in *chorioretinitis*, *optic atrophy*, *microphthalmia*, *retinal changes*, and *cortical visual impairment*. **H**erpes may result in *chorioretinal scarring* or lesions.

Functional Vision Implications

Please note other information in this article specific to *strabismus*, *nystagmus*, *cataracts*, *microphthalmia*, *cortical visual impairment*, and *glaucoma*.

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ABC CHECKLIST FOR VISION OBSERVATION AND HISTORY

It's as simple as A, B, C!

There are three common areas to look for when determining whether a child has a vision problem. A simple A, B, C Checklist can help you along the way! Your job is to be a good observer of the child's eyes and activities. If you have any questions about the vision of a child, please talk to a teacher, a school nurse, or a doctor. Many vision problems can be corrected, if caught early. Be a vision detective and identify vision problems early!

A = APPEARANCE - Do eyes look normal?

- Eyes turn in or out
- Crusty or red eyelids
- Different size pupils or eyes
- Swelling of eyelids
- Conjunctivitis (Pink eye)
- Drooping lid(s)
- Any other observation about "eyes that just don't "look right"?"

B = BEHAVIOR - Teacher/Parent Observation

- Tilts head, covers or closes one eyes for critical seeing
- Difficulty in keeping place while reading - a "finger" reader
- Disinterested in activities involving critical seeing
- Excessive stumbling, awkwardness or daydreaming
- Holds printed material in unusual position
- Has (reported) difficulty seeing at night or in the dark.
- Other behaviors the child does that seem to indicate vision problems.

C = COMPLAINTS - Child's Statements or Your Observations that the Child Might be Experiencing Discomfort during Visual Tasks

- Eyes hurt or blur while reading
- Headaches when reading
- Word move or jump about when reading
- Double vision
- Eye problem following a blow to the head
- Cannot see the chalkboard
- Cannot see well at night or in dark situations
- Eyes hurt or bother child when in bright lighting
- Other complaints or observations that might mean a child is experiencing discomfort during visual tasks.

THINGS TO CONSIDER: PREPARING FOR AN EYE EXAM OF YOUR CHILD

By Tanni Anthony

- 1. As possible, schedule the appointment at a time of the day that is good for your child.**
- 2. Be prepared to provide a family history of visual and health problems** (e.g., are there any eye diseases in your family such as eye crossing, lazy eye, cataracts, etc.).
- 3. Be prepared to give a medical and developmental history of your child** (e.g., was your child born prematurely, is your child taking any medications, are you concerned about any developmental milestones such as late walking, poor eating skills, etc.).
- 4. Be prepared to tell the eye doctor about your observations of your child's visual skills** (e.g., are there things you are worried about such as problems with looking at objects, poor eye-hand coordination skills, bumping into objects while walking, etc.).
- 5. Bring "entertainment" items for your child, as well as toys that she/he visually prefers.** An eye exam takes time – it is a good rule of thumb to bring some food items and favorite toys. If your child is tired, he or she is more likely to look at a favorite item than something the doctor uses during the exam.
- 6. Write your questions down in advance.** It is easy to forget a question when trying to juggle a child and listen to the doctor. A list of questions can be given to the doctor right at the beginning of the exam to help ensure that your questions are addressed.
- 7. Whenever possible, bring your spouse, a friend, or a professional to help listen to the doctor's impressions.** Two sets of ears and hands will come in handy! Decide up front who will be in charge of the child and who will be in charge of taking notes and getting the medical information.