



Idaho Project for Children and Youth with Deaf-Blindness Fact Sheet

CORTICAL VISUAL IMPAIRMENT

Definition:

Cortical Visual Impairment (CVI) is a temporary or permanent visual impairment caused by the disturbance of the posterior visual pathways and/or the occipital lobes of the brain. The degree of neurological damage and visual impairment depends upon the time of onset, as well as the location and intensity of the insult. It is a condition that indicates that the visual systems of the brain do not consistently understand or interpret what the eyes see.

This is not an indicator of cognitive ability

Cause:

The major causes of CVI are asphyxia, perinatal hypoxia ischemia ("hypoxia": a lack of sufficient oxygen in the body cells or blood; "ischemia": not enough blood supply to the brain), developmental brain defects, head injury, hydrocephalus, and infection of the central nervous system, such as meningitis, and encephalitis.

Characteristics:

Initially, children with CVI appear blind. However, vision tends to improve. Therefore, Cortical Visual Impairment is a more appropriate term than Cortical Blindness. A great number of neurological disorders can cause CVI, and CVI often coexists with ocular visual loss, so both a pediatric neurologist and a pediatric ophthalmologist should see the child. The diagnosis of Cortical Visual Impairment is difficult to make. It is diagnosed when a child has poor or no visual response and yet has normal pupillary reactions and a normal eye examination. The child's eye movements are most often normal. The visual functioning will be variable. The combination of the MRI and how the child is functioning visually provides the basis for diagnosis.

Behavioral/visual characteristics:

Children with CVI have different abilities and needs. The presence and type of additional disabilities vary: Some children have good language skills and others do not, and spatial

confusion is common because of the anatomical proximity of the parietal and occipital lobes. Habilitation should be carefully planned. A full evaluation by a number of professionals is essential. The evaluation team might include: a vision teacher and/or teacher of children with severe disabilities, a PT, OT, Speech Pathologist, and an Orientation and Mobility Specialist.

There are several common characteristics of visual function demonstrated by children with CVI:

- * Vision is variable: sometimes on, sometimes off, changing minute-by-minute, day-by-day.
- * Rapid horizontal head shaking or eye pressing is uncommon among children with CVI
- * One third of children with CVI are photophobic.
- * Other may be a compulsive light gazer.
- * Color vision is generally preserved in children with CVI (color perception is represented bilaterally in the brain, and is less susceptible to complete elimination).
- * The vision of children with CVI has been described much like looking through a piece of Swiss cheese.
- * Children may exhibit poor depth perception, influencing their ability to reach for a target.
- * Vision may be better when either the visual target or the child is moving.
- * Many children with CVI may be able to use their peripheral vision more effectively than their central vision.

The behaviors of children with CVI reflect their adaptive response to the characteristics of their condition:

1. Children with CVI may experience a “crowding phenomenon” when looking at a picture; difficulty differentiating between background and foreground visual information.
2. Close viewing is common, used to magnify the object or to reduce crowding.
3. Overstimulation can result in “fading” behavior by the child, or in short visual attention span.
4. The ability of children with CVI to navigate through cluttered environments without bumping into anything could be attributed to “blindsight,” a brain stem visual system.
5. Children are often able to see better when told what to look for ahead of time.
6. Children with CVI may use their peripheral vision when presented with a visual stimulus, appearing as if they are looking away from the target.
7. Some children look at an object momentarily and turn away as they reach for it.

Myths:

The following are some of the many myths associated with CVI:

- * Children with CVI are visually inattentive and poorly motivated.
- * All children with CVI will have cognitive disabilities.
- * CVI is not a true visual impairment.
- * Children with CVI are totally blind.
- * Children whose visual cortex is damaged are Cortically Blind.

Teaching Strategies:

- * A great deal of energy is needed to process information visually. This child might tire easily when called upon to use his visual sense. Allow for intermittent “break” times.
- * Positioning is important. Keep the child comfortable when vision use is the goal, in order that “seeing” is the only task. Head support should be provided during play or work sessions to avoid involuntary shifting of the visual field.
- * Try many different positions to find the one in which the child feels most secure. Infants and toddlers will demonstrate when and where they see best by their adaptive behaviors. If the child needs to use a lot of energy for fine motor tasks, work on fine motor and vision separately until integration of the modalities is possible.
- * When a child with CVI needs to control his head, use his vision, and perform fine motor tasks, the effort can be compared to a neurologically intact adult learning to knit while walking a tightrope.
- * The simpler, more constant, and more predictable the visual information, the better the child with CVI is likely to deal with it. Keep toys and environments simple and uncluttered. Use books with one clear picture on a contrasting simple background.
- * Use familiar/real objects (bottle, cup, bowl, plate, toy, etc.) one at a time. Familiarity and simplicity are very important.
- * Since the color system is often intact, use bright, fluorescent colors like red, yellow, pink, and orange. Colored mylar tissue seems to evoke visual responses.
- * Repetition is very helpful: use the same objects and same process each time to provide familiarity and security for the child. Familiarity breeds response.
- * Look for toys and activities that motivate the child.
- * Vision is often best stimulated when paired with another sensory system. For example, auditory cues from the handling of the mylar tissue may help attract the child’s attention.
- * Introduce new and old objects via touch and verbal description.

- * Try different lighting situations to assess optimal conditions for viewing. Try locating a light source behind, and/or to the side of the child.
- * Try moving the target that you want the child to see: try different visual fields.
- * Allow lots of time for the child to see and to respond to what is being seen.
- * Learn to interpret each child's subtle response cues: such as changes in breathing patterns, shifts of gaze or body position, etc.

Additional Intervention Strategies - Alan Weinstein, Anchorage School District

1. The student may need widely spaced targets. Print may be enlarged, and space within and between words may need to be increased. Visual information will be processed better if space is provided. This will help avoid what is called the "crowding phenomenon."
2. Reduce extraneous sensory information from the student's work/play area. Eliminate unnecessary noise or visual distractions. Present one item at a time. Teach whole concepts and then parts.
3. Use high contrast whenever possible to increase visual performance.
4. Track with your finger or the student might miss or skip visual target. Also, keep your finger on the page and slide it along under what's being read. The same is true for handwriting.
5. Try to be creative with presentation of instructional materials. If it works, continue to use it, and if it doesn't, try new things.
6. Some students with CVI will turn their heads when reading or move closer to the printed page. Allow these adjustments as the student is using his/her best vision. By moving closer, the student will increase the size of the visual image and reduce visual distracters.
7. Be aware of glare in the classroom or light shining off the board. Be verbally descriptive when making presentations and try to have the student in close proximity for best results.
8. When learning new skills, a student with CVI must put all of his/her energy into looking and, as a result, will fatigue easily and need breaks. Keeping activities short and varying them will help keep the student's attention.
9. Try to emphasize organization. If there is too much on the student's desk, he/she will not be able to find what he/she is looking for.
10. Color vision is often intact for a student with CVI and color-coding helps the student to focus. If giving a spelling list, provide adequate spacing, fold paper, place a different colored line under each letter, and place colored line below the sample for student to fill in.
11. Use colored markers to help the student orient to the page, (i.e. red line at top and bottom of the page.)

12. Fold paper to reduce the amount of information presented.
13. Teach cursive writing instead of manuscript if the student is unable to lift his/her pencil and use proper spacing.
14. Skip lines to increase the spacing on the page.
15. Use a computer to increase visual attention and improve contrast.
16. Move work from a horizontal to a vertical plane.
17. Use movement cues, especially in the peripheral visual fields, to stimulate a visual response.
18. Assess the student's best color preference starting with red and yellow first.
19. Test the level of stimulation that works best for the student.
20. A student with CVI may exhibit some light sensitivity. Use an incandescent bulb with a rheostat whenever possible.

If you would like more information, please contact the Idaho Project for Children and Youth with Deaf-Blindness:

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Fact sheets from the Idaho Project for Children and Youth with Deaf-Blindness (IPCYDB) are to be used by both families and Professionals serving individuals with dual-sensory impairments. The information applies to students 0-22 years of age. The purpose of the fact sheet is to give general information on a specific topic. More information for an individual student can be provided through individualized technical assistance available for IPCYDB. This fact sheet is a starting point for further information.



Center on Disabilities and Human Development
College of Education

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