

FACT SHEET

Neurological Visual Impairment

*Also Known as: Cortical Visual Impairment,
Delayed Visual Maturation, Cortical Blindness*

Neurological Visual Impairment (NVI) is now the preferred name for a type of vision impairment that has been and is still referred to as Cortical Visual Impairment or Cortical Blindness. NVI is now divided into three categories: Cortical Visual Impairment, Delayed Visual Maturation, and Cortical Blindness. These three divisions are made according to what area of the brain has been effected.

A variety of studies indicate that the percentage of children with vision impairments who have NVI is between 3.6 and 21%, making it the major cause of vision impairment in children who are deaf-blind. NVI occurs when the part of the brain that is responsible for seeing is damaged. In other words, the eye itself is normal but the brain does not process the information properly. NVI has a variety of causes including, but not limited to, lack of oxygen before, during, and after birth, viral or bacterial illness such as meningitis and cytomegalovirus, or traumatic brain injury. These children can but do not always have additional disabilities. Other types of vision impairments such as optic atrophy (defect of the optic nerve resulting in the inability of the nerve to conduct images to the brain) and optic nerve hypoplasia (a vision impairment caused by a congenital defect of the optic disk) are more common in children with NVI.

NVI effects vision in a variety of ways and causes vision loss that can be from mild to severe, temporary or permanent. There is no way to predict what a young child's vision will be like as they mature but many children with NVI experience improvement with their vision. Fluctuating vision is common. This is most pronounced in children with seizure disorders or in those on certain medications such as Dilantin, Tegretol, or Phenobarbital. A child may be able to see an object one day and be unable to the next. These children may also have better peripheral than central vision and thus look at objects out of the side of their eye. They may have visual field losses that are not symmetrical (one eye may be worse than the other). This uneven loss does not necessarily correspond to hand function. If the left eye is better than the right, the left hand is not necessarily stronger than the right.

Children with NVI experience problems with specific types of visual tasks. They have difficulty with figure-ground (seeing an object instead of the background), and with complex visual displays such as cluttered pictures (a picture of five different animals instead of two). Spatial confusion is common; for example, being unable

to locate their chair even though they can see it. They may also be visually inattentive, not wanting to look at objects, and may prefer their sense of touch. It is common to see a child turn his/her head away as they explore an object with their hands. Seeing with NVI can be compared with trying to listen to one voice in a noisy room or to speaking a foreign language.

Vision stimulation is proven to help most children with vision impairments improve the way they use their vision; this is especially true of children with NVI. For vision stimulation to be effective it needs to happen in everyday real life situations, not only in therapy sessions. Identifying colors in an activity, visually tracking their classmate as they move across the room, and identifying the shape of every day objects are examples.

Suggested Instructional Strategies for Children with NVI

1. Materials, such as pictures, should be simple in form, high contrast (the colors of a picture or object should be different, such as a yellow toy against a black background instead of an orange one), and presented one at a time.
2. Bright lighting can help a child see and attend to visual materials more consistently. Adjust the light, both natural and artificial, to determine what is best. Controlled incandescent lighting may be better than fluorescent lighting.
3. Give the child time to respond to the materials that are being presented.
4. Color vision is usually intact, and color can be used effectively. Yellow and red are possibly easier to see and can be used to outline numbers, letters, or pictures, to color code, or to attract attention to something you want the child to look at.
5. It is also important to keep the color of materials constant to avoid confusion. This also applies to visual cues in general which should also be consistent over time and location. If the child uses a red bowl at home and this is how he knows it is time to eat then the same should be done at school. Watch to see if the child has a preference for size or color.
6. Use a multisensory approach such as pairing an object that you want them to see with a sound.
7. Touch should be considered a major sense for learning. Children with NVI appear to learn effectively through this sense.

8. Repetition and routines can help the child understand their visual environment. If changes are needed make them slowly to allow time to adjust.
9. Fluctuations in visual performance can be limited by reducing fatigue. Try working in short spurts, or divide a long task into shorter periods.
10. Reduce outside noise and other environmental stimulation that may distract the child.
11. Objects can be more easily seen when they are moving. This is especially true when they are in the peripheral fields.
12. Positioning is also important. The more energy being expended on holding yourself up, the less can be used for seeing.
13. Language helps a child to understand a visual situation by adding meaning to it. Be consistent in the language you use.

References

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Fact sheets from the Project for NM Children & Youth Who Are Deafblind are to be used by both families and professionals serving individuals with dual sensory impairments. The information applies to students 0 – 21 years of age. The purpose of the fact sheet is to give general information on a specific topic. More specific information for an individual student can be provided through individualized technical assistance. The fact sheet is a starting point for further information. Information for this Fact Sheet kindly supplied by California Deaf-Blind Services and the Nevada Dual Sensory Impairment Project.