



Visual Field Loss in Infants



It is crucial to have the involvement of qualified vision educators (TVI, O&M) in order to create an effective and individualized instructional plan.

Visual field losses include loss of the right or left half-field (called “hemianopia”) and loss of the lower field. These are caused by damage to different parts of the posterior visual pathway in the brain. Partial field losses may occur in which one quarter (or quadrant) of the field is affected. Field loss can be absolute (no objects seen) or relative (small, dim object not seen). Ideally, visual field loss is tested with a formal device or method that measures the extent or the sensitivity of the person’s peripheral vision. Children may need to be tested informally by observing their eye movements toward small objects in different parts of their visual field.

GENERAL PRINCIPLES: The general principle in rehabilitation for visual field defects in infants is to stimulate awareness and exploration of objects and events in the infant’s non-seeing field. However, when the infant is just learning a new task, such as reaching for objects or fitting puzzle pieces, the objects should be presented in the infant’s central, seeing field. When the child is more practiced in reaching and placing pieces in a puzzle, then the objects can be presented in the child’s non-seeing field as well as in the seeing field.

- When looking at picture books with an infant, encourage looking to pictures in the child’s non-seeing field by talking about the characters/objects and pointing to them.
- Visual scanning (see below) toward the non-seeing field area may be helpful but it needs to be done systematically and in a way that is reinforcing for the child.

WHERE IS THE CHILD LOOKING?: The person interacting with the child should have a good idea where the child is actually looking in space. In children with poor eye alignment (for example, due to strabismus), it can be difficult to determine exactly where the child’s seeing field extends in space. So, the child needs to be watched face-to-face to evaluate where in their spatial environment their eye(s) is (are) directed.

SCANNING TO IMPROVE AWARENESS OF THE NON-SEEING FIELD:

Systematic scanning from left to right in children with visual field defects, either right or left, should be encouraged because this is the way we read in English. If the child has difficulty shifting gaze toward the non-seeing field, this indicates that practice in scanning toward the non-seeing field may be helpful.

- **IMPORTANT POINT:** By scanning we do not mean “following” or “tracking.” Scanning is moving the eyes over a static array of images or objects, using fast, small eye movements called saccades. This is the way we use our eyes to read print. Following or tracking which we do with smooth pursuit eye movements, means moving the eyes to follow a moving object.
- Practice in following a moving object may not be helpful in stimulating awareness of objects in the non-seeing field, because the field moves along with the eyes!

VISUOMOTOR SKILLS: Infants with field defects may not appear to reach well or manipulate objects easily when they are in their non-seeing field. The infant's use of the hand on the side of the field defect may appear to be limited because it is naturally in the non-seeing field.

- When working on fine motor skills, an object should be presented so that the infant sees where the object is in their visual space.
- To encourage use of the hand on the side of the non-seeing field requires consideration of where the infant is gazing and where the objects are in relation to the child's hand.

SPATIAL ORIENTATION: Objects that suddenly move into the child's seeing field from the non-seeing field area may cause them to startle. Thus, busy, noisy environments (like shopping malls, other crowded places) may be disorienting to the infant with a complete field defect. New places may be disorienting as well.

- Showing the child the entire space in a new setting may help the child anticipate things in their non-seeing field.
- A person first approaching the infant should move into their view from the SEEING field so that the infant can have some warning of their presence.

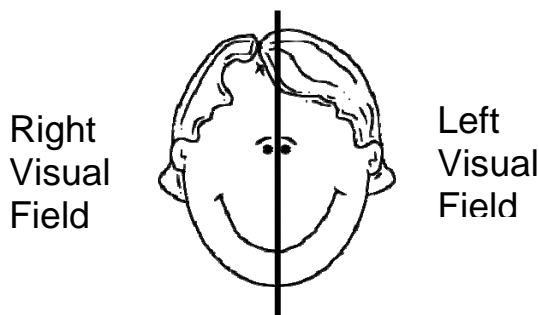
PERCEPTION: Infants may not seem to recognize a familiar face or object because only part of the face/object falls in the infant's seeing field.

- Care should be taken that the child is shown the complete object (say for play) or face (for social interaction)
- The child should be encouraged and helped to visually explore the whole object

MOBILITY: The normal course of crawling and walking may be delayed in an infant with a field defect. A toddler may stumble into things on the side of the field defect. Lower field defects may cause falling over objects on the floor. Upper field defects may cause hitting the head on objects at eye level. Going downstairs or walking on any uneven surfaces may be quite difficult for the child with a lower field defect (including hemifield defects or quadrant field defects).

- The child may need to be cued repeatedly to attend to space in the non-seeing field, especially in new environments.
- Objects that might interfere with ease of movement should be removed or highlighted to contrast well with the surroundings.
- Steps on staircases can be easier to see if the edge of each step is lined with bright tape.

REMINDER: When you are looking at your child's face, his or her visual field will be the mirror image or YOUR visual field, that is, your child's RIGHT field will be on your LEFT and his/her LEFT field on your RIGHT.



Compiled by **D. Luisa Mayer, Ph.D.** New England Eye Clinic at Perkins,
Associate Professor, New England College of Optometry.