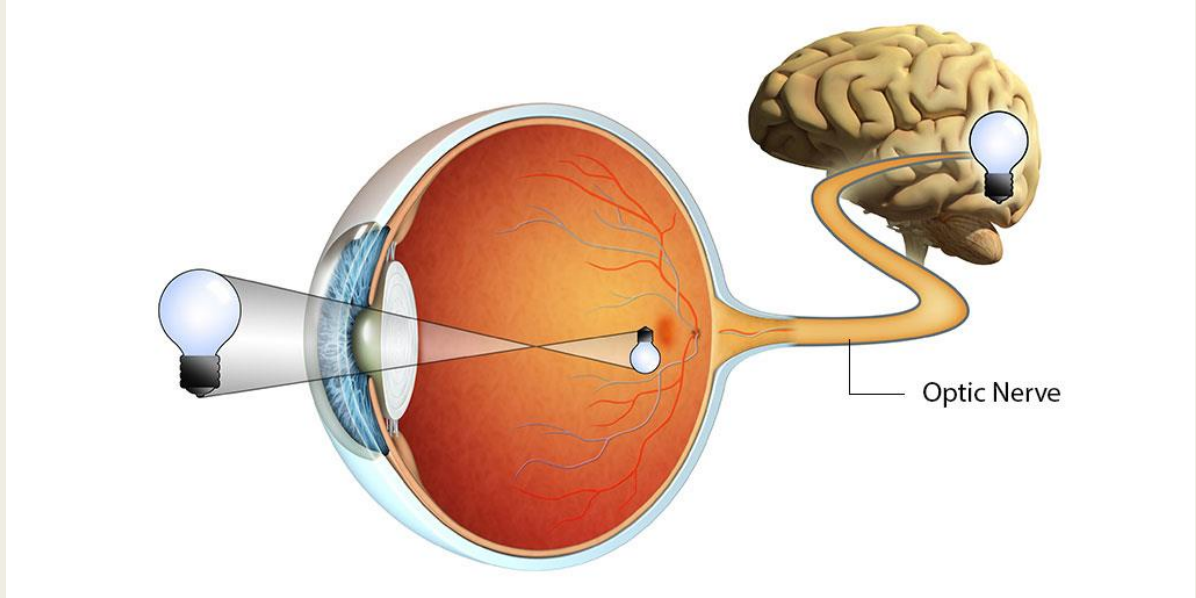


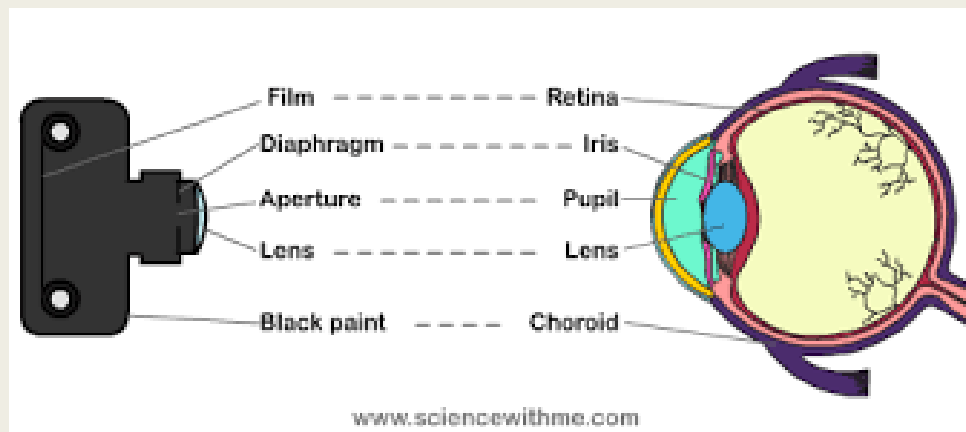


INTRO TO NEUROLOGICAL VISUAL IMPAIRMENT

Jenni Remeis M.Ed., TVI, COMS



VISUAL PATHWAY



Causes of Neurological Visual Impairment

- Complications of prematurity (asphyxia, hypoxia, brainbleeds, damage to white matter outside the ventricles)
- Oxygen deprivation (hypoxia and ischemia)
- Periventricular Leukomalasia
- Shaken baby or other trauma
- Infections and/or viruses before, during, or after
(TORCH, CMV, meningitis, encephalitis, Zika)
- Brain tumors and seizures, genetic disorders
- Maternal substance abuse
- Hydrocephalus and congenital brain abnormalities

Visual Behaviors of CVI

Visual Reflex

Need for Light

Latency

Color

Visual Novelty

Movement

Visual Field Preference

Complexity

Distance Viewing

Visual Motor



Visual Reflex

- Response to touch: Student blinks when bridge of nose is touched
- Response to visual threat: Student blinks when something is approaching eyes

» No response » delayed response » immediate response »



ATTRACTION
TO LIGHT

Characteristics: Light Sources

- Severe CVI-look past toys and faces to light sources
- Prefer more concentrated than diffuse sources
- As vision improves, light gazing becomes more of a meaningful visual behavior
- In time, become more interested in brightly colored toys
- Some are photophobic (narrow eyelids, bow head, close eyes)
- Some like work on a lightbox, others do not
- Some are more comfortable in low light and prefer hat or visor in bright sun
- Dr. Good found them to test better acuity under low luminance levels



Assessment Considerations

- Ask about child's response to light
- Be aware of lighting in the room
- Position child so light sources such as windows or lamps are behind them
- Look for signs of light sensitivity
- Use light up toys or flashlight to enhance toys



LATENCY

Challenges: Response Delays

- It may take some students 15 seconds or more to respond to a stimulus or a request. So, learn to wait...count in your head if needed.
- These children require more processing time, especially if the task is new or if surroundings and people are not familiar.
- Processing time varies with:
 - medications*
 - environments*
 - environments –*
caregivers
 - familiarity of task –*
the sense

Assessment Considerations

- Commit to talking your time
- Provide QUIET processing time
- Do not move materials immediately if child turn away
- Leave materials in one space for long period of time
- Consider using mobile stand or arch for reaching activities
- Count in your head!



COLOR

How color can be used

- Bright, highly saturated color pop from environment. They attract and maintain visual attention
- Black, white and gray are difficult to distinguish
- Adding preferred color to materials is helpful
- Red, Yellow, fluorescent

Assessment Considerations

- Ask family if child has color preferences
- Incorporate preferred color into assessment materials
- Provide contrasting background to colors (black is great)
- Determine color based on lighting preferences
 - *i.e. yellow in dim, red in bright*



VISUAL
NOVELTY



When introducing novel items, it is helpful to include characteristics of familiar item. By highlighting the salient features of the object with the child's preferred color, they may be more inclined to visually regard and learn what makes it a "horse/zebra"

Assessment Considerations

- Ask family to gather child's favorite toys - make sure there is a variety, some simple and some complex
- Provide extended time when presenting novel toys or items
- Complete assessment in a familiar environment



MOVEMENT

Movement

- Fearful around small moving animals, traffic, ball games and areas with a lot of movement such as playgrounds
- Prefers watching TV shows and movies with limited movement
- May not see from a moving car, but can see when the car stops



Considerations For Assessment

- Use materials that have movement properties to capture attention
- Provide slight movement to toys
- Avoid areas with heavy traffic/activity...siblings may need to be busy in another area
- Consider providing movement to child such as bouncing on therapy ball



VISUAL FIELD PREFERENCE

Up, Down, Side to Side..

- Peripheral vision is better than central at first
- Child notices things at the side as well as movement
- Some may have blind spots
- Damage to one side of brain results in field loss on the other side
- Damage to top of brain at the back on both sides, leads to lower field loss
- Brodsky 2002, 34 children with CVI showed ocular motor adaptations for field loss such as exotropia or torticollis toward side of field defect to get a better visual view of world
- Encourage child to look in area of defective field....can change it

Considerations for Assessment

- Ask family where they typically capture visual attention, where do they hold toys, where does the child hold toys
- Begin in the child's preferred visual field
- Provide extended processing time in non-preferred fields
- Consider location of brain damage to determine possible field deficits
- Potential considerations of torticollis



VISUAL COMPLEXITY

Complexity of object

Complexity of object



Complexity of Array



Complexity of face



Complexity of sensory environment



Distance



Considerations for Assessment

- Use toys and objects that are visually simple
- Provide items in isolation first – then move to two and so on, based on ability
- Be cognizant of clothing patterns
- Provide high contrast background (ask family for dark towel or blanket)
- Look for differences when playing on patterned carpet vs. solid blanket
- Provide items up close
- Position yourself and the child in a way that eliminates external stimulus
- Be aware of sensory environment
- Talk after tasks, not during them



**VISUAL
MOTOR**

Difficulty engaging vision with motor



Difficulty looking and reaching for objects at the same time



Some may look and walk, look and walk.



ATNR (asymmetrical tonic neck reflex)

Considerations for Assessment

- Remember that reach and look may happen in two steps
- Leave items where they are presented long enough for child to respond
- Avoid complex toys with lights, colors, movement, music
- Children may not be able to maintain visual engagement while working on motor tasks, such as with PT.
- Use familiar objects to solicit visual interest

Considerations for IFSP Development

CVI Adaptations for Routine Activities	Mealtime	Play	Bath	Outside
Color	Red spoon			
Movement	Provide slight movement to spoon			
Visual Latency	Wait 20 sec			
Visual Fields	Present on right			
Need for Light	Seat Ryan so back is to kitchen window Put light reflective tape on spoon			
Visual Novelty	Use same spoon			
Complexity	Wear black apron over pattern. Stay quiet while he searches			
Distance	Hold spoon within 5" of face			
Visually Guided Reach				

When Should You Contact Vision Provider?

- If you notice diagnoses that fall on red flag list
- If family indicates that the child had a healthy eye exam but does not appear visually engaged
- Descriptions of behaviors
 - *My child looks through me*
 - *My child appears to see some days and not others*

AS SOON AS POSSIBLE 😊

Questions/Comments

Resources

Lueck, Amanda Hall, and Gordon Dutton, *Vision and the Brain: Understanding Cerebral Visual Impairment in Children*. New York; AFB, 2015. Print

Roman-Lantzy, Christine. *Cortical Visual Impairment: Approach to Assessment and Intervention*. New York: AFB Press, 2007. Print

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