Cerebral/Cortical Visual Impairment (CVI): Diagnosis and Environmental Considerations

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Agenda

Explore materials and environments that are used with young learners diagnosed with Cerebral/Cortical Visual Impairment (CVI)

Explore strategies for presenting materials at the level of complexity learners can access based on assessment and diagnostic teaching
What is Cerebral/Cortical Visual Impairment?

CVI is a neurological visual disorder.

The two types of visual disorders (ocular & neurological) can coexist.

CVI is suspected by:

• a normal or close to normal eye examination that does not explain visual performance

• a medical history which typically includes neurological problems

• the presence of unique visual/behavioral characteristics
Simply stated:

CVI occurs when the structures of the eyes work fine (unless another visual impairment is present), but the brain is unable to interpret the information.
Causes of CVI include:

- lack or insufficiency of oxygen (anoxia, hypoxia, ischemia, and asphyxia)
- intraventricular hemorrhage
- head injury
- hydrocephalus
- infections of the central nervous system such as encephalitis and meningitis
- unknown causes
The degree of CVI can range from \textit{severe} (multiple disabilities with many atypical visual behaviors) to \textit{mild} (typically developing child with limited atypical visual behaviors).

The degree of neurological damage and CVI depends upon the \textit{age of onset}, as well as the \textit{location} and \textit{intensity} of the damage.

The presence of CVI is \textit{not an indicator} of the child’s cognitive ability.

Some visual behaviors can be resolved, while others may need \textit{environmental accommodations} for the child to be successful in school and at home.
Plasticity

• The brain can learn to reroute information/find new neural pathways

• Improved visual function is possible at all ages

• It is important that we not set limits or have a predetermined idea of what a child can learn or how far a child can progress.
Parent/Caregiver

Become aware of red flags:

• Not using vision in the same way as other children the same age

• Light gazing

• No blink

• Child is “looking through them”

• No eye contact
Medical

Ophthalmologist or Neurologist

Magnetic resonance imaging (MRI): utilizes a strong magnetic field and radio waves to create detailed images of the organs and tissues within the body

Visual Evoked Potential (VEP): measures electrical activity in the vision system

Functional magnetic resonance imaging (FMRI): measures brain activity by detecting changes associated with blood flow
Teacher for children with visual impairments

• Functional Vision Assessment
• Parent/Caregiver interviews
• Learning Media Assessment
• Lots of observation in a variety of environments
• Cognition level does not = vision ability
• Provide intervention strategies ASAP!
• Remember: The human brain is AMAZING!
Every child with CVI is unique

We need to get to know the child through play with familiar and unfamiliar materials, assessment, caregiver conversations, observations in many environments to be able to set goals and plan interventions.
Getting to know the child

**INTERVIEW CAREGIVERS**

- Information on medical background
- Eye report
- What does child like to look at
- What are your concerns
- Child’s favorite color
- When is child most visually alert
- Does child look directly into faces
- Does child notice things that move more than things that are stable
- Does child seem to look “through” rather than at objects

**OBSERVE CHILD**

- In living and learning environments
- Quiet and noisy times
- Near and distance
- Familiar and unfamiliar objects
- Cluttered and simple backgrounds
- Interest in objects of specific color (color preference)
- Movement
- Light gazing
- Preferential viewing
Get to know the child through play....
Environmental Considerations

- Physical environment (room organization, positioning of body, number of items in array)
- Physical materials (attribute of toys – one color or more, lights, sounds, movements)
- Interactions with people (rate of speech, proximity, faces/identification)
- Sensory environment (environmental noise, smells, tastes, temperature)
Adjust the environment one variable at a time

Start simple…move to complex

Remove unnecessary visuals
Remove unnecessary auditory
Remove unnecessary olfactory
How much light is needed to draw child’s attention?

- Large white light draws initial attention
- Reducing white light focuses attention on smaller target
Add color….is the child still able to attend?
How much visual complexity can the child tolerate and still be able to complete task?
Increase number of shapes
Increase number of shapes and complexity
Become a diagnostic teacher – integrate assessment and instruction

Support the student at the level where they are.
Facilitate learning to the next level…..
• Learn to look
• Explore with other senses
• Look to learn

It will change…..never be stagnant
Become an active observer

Learning to Look

Exploring

Looking to Learn

Follow the child’s lead: Expand the activity
Learning to look
Build Visual Behavior
Exploring
Integrate Vision with Function
Integrate function continued...
Looking to Learn
Looking to Learn

Transitions to school or other new environments may need increased visual support due to:

- Noise levels (auditory and visual)
- Movement of others and travel needs
- Educational demands (complexity of print work)
Alphabet Practice Test

Fill in the bubble next to the correct answer.

Say the word. Which letter is the first letter of the word?

- d
- c
- a
- f

1. Say the word. Which letter is the first letter of the word?
   - t
   - e
   - r
   - d

2. Say the word. Which letter is the last letter of the word?
   - e
   - p
   - n
   - t
Simplify
Organize
Literacy Suggestions
Strategies such as presenting the letter in the child’s preferred color or outlining a word in the child’s preferred color have been suggested.

Students may prefer to have a color/font difference to signal a change in letters

or letters spaced further apart to simplify complexity

or Braille? maybe
Considerations after Learning Media Assessment

**Print**
- Fatigue
- Space needed between letters
- Reading speed
- Print size needed
- Visual diagnosis
- Visual prognosis

**Braille**
- Preference for tactile exploration
- Physical ability to access braille
- Visual diagnosis
- Visual prognosis
What can you observe?

Remember: look, explore, learn
Teaming Challenges

• Lack of team understanding of CVI diagnosis
• Vision “low on radar” due to multiple disabilities
  Or
• Vision ”high on radar” and is blamed for everything
• Little time for collaboration
• Determining amount of service time
Leading the team

Learn about CVI and the child’s strengths/challenges
Provide an in-service to ALL team members
Set up a communication plan
  • Email, Dropbox, texts, set meeting time
  • Embedding matrix for goals across the child’s day
Talk about the environment
Work as a team to write IEP goals
As the team’s knowledge about the child’s needs grow..your direct time will decrease
Embedding vision into a child’s day

<table>
<thead>
<tr>
<th>Objective (CVI Characteristics)</th>
<th>Arrival</th>
<th>Calendar</th>
<th>Physical Therapy</th>
<th>Adapted P.E.</th>
<th>Lunch</th>
<th>Literacy</th>
<th>Departure</th>
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</thead>
<tbody>
<tr>
<td>1. Color</td>
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<td>2. Movement</td>
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<td>7. Distance viewing</td>
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<td>10. Visually guided reach</td>
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# Embedding Strategies in Child’s Day

<table>
<thead>
<tr>
<th>Objective (Ten CVI Characteristics)</th>
<th>Switch</th>
<th>Calendar</th>
<th>Mobile/Prone/Ipad</th>
<th>Free Play</th>
<th>Adaptive Swing</th>
<th>Sensory Room</th>
<th>Get ready for home</th>
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</thead>
<tbody>
<tr>
<td>1. Conver (red)</td>
<td>Use red switch on black background</td>
<td>Position fully supported</td>
<td>Simple red or shiny objects</td>
<td>Guidance lined with red tape</td>
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<td>2. Movement</td>
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<td>3. Visual Intensity (6-10 second wait time)</td>
<td>Wait time</td>
<td>Add movement to activity to engage</td>
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<td>Wait time</td>
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<td>4. Visual fields (left peripheral field preference)</td>
<td>Place switch for left peripheral viewing</td>
<td>Black out visual clutter</td>
<td>No sound on apps</td>
<td>One object presented in front of task background</td>
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<td>5. Complexity (block out all other visual distractions, noise/music, sounds)</td>
<td>Face away from lights/windows</td>
<td>Turn overhead lights off</td>
<td>Turn tap light on in ruble</td>
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<td>6. Light gate</td>
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<td>7. Defense viewing</td>
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Where to learn more about CVI

• AER Neurological Visual Impairment Division
• APH CVI website: http://tech.aph.org/cvi/
• CVI Scotland: http://peroosh.com/sites/cvi_scotland/index.php
• American Foundation for the Blind – stay posted!
• Perkins e-learning, webinars, Paths to Literacy
• TEACHCVI: https://www.teachcvi.net/introduction-to-cvi
• BARTIMEUS CVI Series
  https://www.bartimeus.nl/specialistische-kennis/wat-cvi
Thank you for listening!!!