Student-Centered AAC for Learners with Cortical Visual Impairment (CVI): Assessment, Design, and Implementation

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Cortical Visual Impairment

- **Information Based on:**

- **Photography credit:**
  - SLP-CCCs: Megan Mogan, Kaitlin Ahl, Lori Robinson
  - Emma Nelson, Vermont Sensory Access Project
  - Video credit: Kaitlin Ahl, SLP-CCC
What is Cortical Visual Impairment?

- Vision loss due to damage or malformation in the brain that interferes with the child’s ability to understand visual information coming from the eyes.

- CVI is the leading cause of visual impairment in young children living in the Western Hemisphere.

(Good, et al., 2001; Roman, 2018)
Population Overview

2016 National DB Child Count

- 10,749 age 0-21 DB
  - 2808 diagnosed CVI out of 9,635 (29.1%)
  - 1331 unknown out of 9,635 (13.8%)

Significant variability from state to state

- AZ: 128/211 CVI (60.7%), 0 unknown
- AL: 6/178 CVI (3.7%), 1 unknown
- PA: 125/453 (27.6%), 0 unknown
- TX: 206/685 (30.1%), 92 unknown

Why is it important to identify and assess?

- Specific interventions to IMPROVE visual functioning
  - Different approaches depending on where the student falls on the RANGE of visual functioning
  - Guided by Phase, adapted by Characteristic

Intervention is a collaborative TEAM EFFORT
A Balanced Communication Plan

Sensory Access
- CVI Phase and Characteristics
- Preferred learning channels

Communication Level Access
- Presymbolic/Symbolic
- Prelinguistic/Linguistic

- Multi-sensory access
- Universal Design

- Model TOTAL COMMUNICATION
- Provide a robust AAC program receptively
In Phase II, the learner is able to use vision to access information (to varying degrees) within activities throughout the day. The learner in Phase II requires thoughtful adaptations to support visual attention in all activities/routines based on how the CVI Characteristics specifically affect his/her functional vision.

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### Accessible Modes of Communication (Expressive & Receptive)

**Note:** In addition to adapting the material design and presentation of AAC systems, it is critical to select AAC modes that are appropriate to the learner’s communication development. Below are listed examples of appropriate modalities for learners who communicate on a range of symbolic development. Note that learners in Phase II may or may not be able to access 2-D materials. *Provide access to multiple modes of communication, even if the learner is using abstract forms or dynamic displays.*

<table>
<thead>
<tr>
<th>For Presymbolic Communicators</th>
<th>For Emerging Symbolic (Concrete) Communicators</th>
<th>For Abstract Communicators: Words and Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interaction strategies (receptive): Support visual gestures with anticipation cues (depending on learner, can be visual, tactile, auditory)</td>
<td>Model conventional gestures and signs visually; continue to provide additional auditory and tactile cues as needed</td>
<td>Voice output devices and dynamic displays; Displays may have 3-4 vibrant colors; if learner can access 2-D, use symbols with reduced complexity and color to highlight salient features</td>
</tr>
<tr>
<td>Visually concrete tangible symbols for anticipation; increase complexity of target items (items with 3-4 colors); <strong>2-D</strong> even if visually accessible (photo, drawing) is too abstract for a presymbolic learner</td>
<td>Tactile/3-D or visual tangible symbols with color and complexity adaptations (tactile/3-D if learner is still requires concrete icons)</td>
<td>iPads and tablets: may use communication devices with appropriate level of color and complexity adaptations; use apps with increased complexity</td>
</tr>
<tr>
<td>Use whole or partial objects that are concrete representations of preferred and frequent activities, events, objects</td>
<td>Use partial objects or tactile representations that closely resemble what they refer to</td>
<td>Present 2-D images with color highlights/frame, and present large print words with a preferred color (outline the shape of the letters with color)</td>
</tr>
</tbody>
</table>

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1. Complete the CVI Range (Roman, 2007) before using this tool. In Phase II in particular it will be useful for the collaborative team to complete a CVI Schedule (Roman, 2007) to plan specific adaptations to materials and presentation based on which Characteristics are most impacted in each activity, throughout the day. 2. Do not limit the number of cells in a display; use eccoders to block unused cells.

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Sensory Access for CVI: Design and Implementation

Design

Material Considerations
What does the AAC system look/feel like?

Environmental Considerations
How can the setting be modified?

Implementation

Presentation of AAC
How can the learner best access the AAC system/mode?
Phase I Intervention: Most Characteristics

Goal: Stabilize visual functioning

- NO visual processing of 2-D
- Maximize visual access to modalities but don’t expect visual fixation
- Tactile components are critical

Looking is a goal in itself

High level of environmental control
Phase II Intervention

Goal: Integrate Vision and Function

- Able to use vision in activities, with adaptations and opportunities
- Early $\rightarrow$ Late Phase II
  - Level of visual adaptation needed
- 2D emerging

What needs to be adapted visually in order to elicit and sustain visual attention at targeted points in a routine?

CVI Schedule & Planning Tools
Phase III Intervention

Goal: Vision for learning

- Demonstrate visual curiosity
- Can process 2-D
- Need adaptations to support learning and visual vocabulary

"Salient feature - what specific part of the symbol gives it unique meaning?"

“Critical component” (Bent & Buckley, 2013)
Colored Keyguard
http://www.laseredpics.biz

Beware of glare!
Sight Words - Bubbling with Color

cat
dog
Don’t limit the number of cells on a device; Limit the number of cells used in the array
Environmental Considerations & Presentation

- Complexity
- Visual Fields
- Movement
- Visual Novelty
- Light
- Distance
- Color
Accessible Modes of Communication

Presymbolic
Pre-intentional, Unconventional, Conventional

Emerging Symbolic
(Concrete)

Abstract
Words & Language

Approach Framework

Total Communication
Shared Forms
Aided Language Stimulation
Prelinguistic Milieu Teaching
Augmentative and Alternative Communication (AAC) includes all forms of communication (other than oral speech) that are used to express thoughts, needs, wants, and ideas. We all use AAC when we make facial expressions or gestures, use symbols or pictures, or write.

(ASHA, 2016)
Example: (Late) Phase II, Emerging Symbolic
• What are the CVI adaptations?
• What are the communication modifications?

**CVI:**
• Partial objects (not yet 2-D)
• Black backdrop (visual clutter)
• Red rectangle highlight
• Red tape on rim of finished box

**Communication – Levels and Modes:**
• Tangible symbols
• Visual sign with tactile modifications
• Constant contact/tactile support
• Speech / audition
• Prompts / wait time
Systems that grow with the child

- From 3D to 2D
- From Pre-symbolic to Symbolic
- Developing complex language
Visual & Tactile Modifications to Sign

Phase I:
• Tactile Sign / Hand-Under-Hand Modeling

Phase II (Early → Late):
• Visual sign at near, tactile supports still needed
• Consider visual field preferences - tracking
• Reduced complexity of backdrop is critical
• Allow for “looking away” in visually guided reach

Phase III:
• Visual sign may be accessible at increased distance
• Tactile modifications still may be needed in complex or novel environments

Accessible Back-channeling:
Visual
Tactile
Auditory
Combination/TOTAL COMM.

All Phases: Consider background complexity (clothing, backdrop)
Example: Emergent 2D Literacy, Tactile Sign Modification
“In addition to technology, ...early communication programs may be maximally effective when participants are taught to combine technology with unaided communication responses.”

- Brady & Bashinski, 2008
Questions?
References


Thank you for participating. For more information please contact us at the number or email below.

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