



CVI Phase I: Designing and Implementing Appropriate AAC

Goal of Phase I intervention: Stabilize Visual Functioning

Design	Material Considerations – What does the AAC system look/feel like?		
	<u>Color</u> : Use favorite (usually bright, primary) colors such as red or yellow; Use only one or two colors on a target.	<u>Complexity</u> : Limit the number of items on a dynamic display or in partner-assisted scanning.	Use tactile materials and visually adapted 3-D objects as AAC; learners in Phase I cannot process 2-D images.
	<u>Light</u> : Use AAC that is back-lit, such as a switch or display with a light.	<u>Novelty</u> : Develop AAC vocabulary with familiar items and words, pair with familiar objects.	Outline visual AAC targets with (colored) tactile components (keyguards, tactile grids)
	<u>Movement</u> : Use reflective materials such as gold or red shiny tape/paper to line or cover AAC mode (a symbol or finished box)	Suggested materials (use only 3-D objects, no 2-D symbols): Red/yellow (or preferred color) tape, gold sticker/foil; flashlights, black felt boards and backdrops, Velcro, preferred and familiar items paired with any aided AAC, light box	
Environmental Considerations – How can the setting be modified?			
Implementation	Learners in Phase I require high level of environmental control in order to elicit and sustain visual attention. Minimize background noise, visual clutter, distracting bright primary sources of light and movement (ceiling lights, windows, ceiling fans). Position learner away from primary light sources. It may be difficult for the learner to visually access AAC while performing other tasks or in movement (Orientation & Mobility) routines, or when positioned/seated without necessary trunk or head support.		
	Presentation of AAC – How can the learner best access the AAC system?		
	<u>Movement</u> : Move the visual target (AAC mode or symbol) to elicit or sustain visual attention	<u>Light</u> : Illuminate visual targets with a flashlight, from behind; Present items on a light-box	<u>Distance</u> : Present all AAC at near distance (usually less than 18”) from learner
	<u>Visual Field Preference</u> : Present all AAC materials in the learner’s preferred visual field(s).	<u>Visual latency</u> : After presenting a visual AAC target, allow sufficient wait time for learner to respond	<u>Absence of visually guided reach</u> : Support learner to touch AAC materials with hand-under-hand support
	Allow the learner to attend to visual AAC materials without auditory distraction/background noise	Present AAC against a black trifold board to reduce visual complexity, present visual targets one at a time.	Use black trifold board behind the student with sides folded out to block visual complexity in peripheral fields.

In Phase I, CVI has the most severe impact on vision, and all or most of the CVI Characteristics have an impact on the learner's visual functioning.¹

In Phase I, looking is a goal and an activity in itself; Use visual preferences to elicit visual attention, but do not expect the student to visually attend to an AAC system for prolonged periods of time. Adapt visually and tactilely.

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. Learners in Phase I are less likely to be abstract communicators due to more severe neurological impact. *In all Phases, learners (and partners) will use multiple modes of communication.*

For Presymbolic Communicators	For Emerging Symbolic (Concrete) Communicators	For Abstract Communicators: Words and Language
Interaction strategies (receptive): Use responsive, non-intrusive tactile strategies such as touch cues, name cues *resources at nationaldb.org	Continue use of responsive interaction strategies (touch cues, name cues); support joint tactile and visual attention on familiar and preferred objects.	Voice output devices and dynamic displays: Focus on auditory and tactile access to devices. Highlight larger components (i.e. the device itself with suggested materials).
Tactile tangible symbols for anticipation ² (visually adapt using design recommendations to maximize access)	Tactile tangible symbols for communication: calendar systems, choice-boards	Use high-tech devices (iPad, tablet) for visual experiences with looking at preferred apps that include color and movement, with minimal complexity.
Use whole or partial objects that are concrete representations of preferred and frequent activities, events, objects	Use partial objects or tactile representations that closely resemble what they refer to	*In Phase I, the learner will not be able to access print medium or 2-D images. Allow the learner to attend with auditory and/or tactile input.
Considerations for receptive and modeled sign language: In Phase I, the learner may need to receive sign language tactilely or with hand-under-hand support. In all Phases consider background complexity when presenting signs (clothing, backdrop).		

¹ CVI Phase and the child's specific visual behaviors in each Characteristic are assessed using **The CVI-Range Assessment (Roman, 2007)**. Complete CVI-Range before using this tool.

² Tangible symbols for anticipation: Develop a connection between the symbol and the activity/event that immediately follows the introduction of the symbol. Refer to the symbol every few minutes during the activity/event, and place in a "finished box" when done.

This tool was developed using content from: Roman, C. (2007) Cortical visual impairment: An approach to assessment and intervention. New York, NY: AFB Press.

Presymbolic and emerging symbolic communication development can be assessed using *The Communication Matrix*: Rowland, C. (1996). Communication matrix. Portland, OR: Design to Learn.



CVI Phase II: Designing and Implementing Appropriate AAC
Goal of Phase II intervention: Integrate Vision & Function

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.¹

Design	Material Considerations – What does the AAC system look/feel like?		
	<u>Color</u> : Use preferred color(s) to highlight major/salient features of devices and symbols; Use color to frame targets/symbols on partner-assisted scanning displays	<u>Complexity</u> : Increase the number of items on a display/dynamic device to the degree that the learner can access. (e.g., may be up to 4 at a time, with adequate spacing) ²	<u>Novelty</u> : Develop AAC vocabulary with familiar items and words, pair with familiar objects and highly adapted 2-D images such as photos of real objects.
	<u>Light</u> : Support use of visually difficult targets with back-lighting, either on the display/target itself, or on a light box	If the learner is able to access 2-D targets, minimize complexity of array and target (for any form of AAC).	If necessary to support tactile access (visually guided reach), outline visual AAC targets with (colored) tactile components (keyguards, tactile grids)
	<u>Movement</u> : Use reflective materials such as gold or red shiny tape/paper to line or cover AAC mode (a symbol or finished box)	Suggested materials: Same as Phase I allowing for increased complexity as determined by CVI Range Assessment; may use 2-D photos and symbols	
	Environmental Considerations – How can the setting be modified?		
Implementation	Learners in Phase II are able to attend visually in less controlled and more natural environments with increased sensory and visual complexity simultaneously in the background. The learner will still require some degree of environmental control, determined by the CVI Range Assessment, Rating 2. Moderate novelty of the environment.		
	Presentation of AAC – How can the learner best access the AAC system?		
	For learners who do not have access to 2-D (early Phase II), provide exposure to 2-D in aided AAC modes with modeled use; Support with descriptions (describe, point to, or highlight salient features)		
	<u>Movement</u> : Use movement at a distance to attend; use Phase I strategies when learner is fatigued	<u>Light</u> : Present complex items on a light-box or use a flash-light with complex or novel targets	<u>Distance</u> : Learner may be able to attend at increased distance (2-3, 4-6, 10') depending on complexity
	<u>Visual Field Preference</u> : Learner may now be able to view AAC mode in central, upper fields (at midline)	<u>Visual latency</u> : Allow processing time for more complex or novel AAC targets	<u>Visually guided reach</u> : Allow the learner to look-look away-touch for more complex targets
	Used increased verbal or signed description and labeling of what the learner is looking at, for total communication.	Use black background for more complex/novel targets or environments, use increased complexity of background in general	Support attention to faces by considering additional sensory/visual complexity (while partner is speaking vs silent, moving vs still)

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.

For Presymbolic Communicators	For Emerging Symbolic (Concrete) Communicators	For Abstract Communicators: Words and Language
Interaction strategies (receptive): Support visual gestures with anticipation cues (depending on learner, can be visual, tactile, auditory)	Model conventional gestures and signs visually; continue to provide additional auditory and tactile cues as needed	Voice output devices and dynamic displays: ² Displays may have 3-4 (bright, primary) colors; if learner can access 2-D, use symbols with reduced complexity and color to highlight salient features
Visually concrete tangible symbols for anticipation; increase complexity of target (items with 3-4 colors); *2-D, even if visually accessible (photo, drawing) is too abstract for a presymbolic learner	Tactile/3-D or visual tangible symbols with color and complexity adaptations (tactile/3-D if learner is still requires concrete icons)	iPads and tablets: may use as communication devices with appropriate level of color and complexity adaptations; use apps with increased complexity
Use whole or partial objects that are concrete representations of preferred and frequent activities, events, objects	Use partial objects or tactile representations that closely resemble what they refer to	Present 2-D images with color highlights/frames, and present large print words with bubbling in preferred colors (outline the shape of the letters with color)
Considerations for receptive and modeled sign language: Visual sign at near, with reduced complexity of backdrop including clothing and background. Depending on where the learner presents in Phase II, may still benefit from some level of tactile access to sign.		

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 occluders to block unused cells.



CVI Phase III: Designing and Implementing Appropriate AAC

Goal of Phase III intervention: Vision for Learning

In Phase III, the learner demonstrates visual curiosity, functional use of vision in a range of environments and activities, and ability to attend to 2-D targets. Learners in Phase III continue to benefit from visual adaptations in particular to support complexity, and require extensive scaffolding to learn salient features of visual vocabulary.¹

Design	Material Considerations – What does the AAC system look/feel like?		
	Color: Increased number of colors on a display or target (6-8); Use color to outline (bubble) words and highlight salient features of complex 2-D visual information on symbols, images, books.	Complexity: Increased complexity of array and target on 2-D materials and on background patterns; Support with adaptations to salient features of targets	Novelty: Use AAC symbols that closely represent familiar visual vocabulary. Increase novelty by showing different images/symbols of these core vocabulary while highlighting and teaching salient features
	Light: Use back-lighting to support access to 2-D and complex targets (iPad/tablet, dynamic display) as needed	Complexity: Increased number of cells visible on displays and number of symbols used on communication boards	Increased simultaneous use of multimodal (total) communication, for example using speech/sign and visual AAC modes at the same time
	Note: Depending on the level of visual functioning in Phase III, the learner may not require extensive design modifications; determine specific use of color, light etc. based on CVI Range Assessment. ¹ See below: emphasis in Phase III is often on implementation/learning.		
Implementation	Environmental Considerations – How can the setting be modified?		
	Learners in Phase III do not require extensive modifications to the environment, but may experience difficulty in novel or complex environments or when overstimulated or fatigued. Determine additional environmental modifications with CVI Range Assessment, Rating 2.		
	Presentation of AAC – How can the learner best access the AAC system?		
	Emphasize <u>implementation</u> of AAC through conceptually appropriate strategies to teach salient features: <i>What is the unique, defining feature of a visual target (in AAC, often a symbol or image)?</i>		
	Complexity: Consider the positioning of the child with regard to background complexity; assess complexity of patterns on clothing	Use partner-assisted strategies to point out, highlight, label and describe AAC targets and visual references	Distance: Learner may be able to access AAC/communication up to 10'-20' away; may require visual adaptations to complexity at distance
	Visual Field Preference: Learners in Phase III often still have difficulty in lower field – present AAC accordingly; Use a slant board for books/2-D	Visual latency: Allow for increased latency in complex environments or when the learner is fatigued	Visually guided reach: Allow the learner to look-look away-touch for the most complex targets; allow wait time and add visual/auditory prompts
	Used increased verbal or signed description and labeling of what the learner is looking at, for total communication.	Address AAC presentation differences in seated vs moving (Orientation and Mobility) routines	Support attention to faces by considering additional sensory/visual complexity (while partner is speaking vs silent, moving vs still)

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. Learners in Phase III may be able to visually access 2-D information, but this information (photographs, line drawings, letters/words) may be inappropriate as a primary expressive mode in terms of the learner's symbolic development.² *Provide access to multiple modes of communication for all learners.

For Presymbolic Communicators	For Emerging Symbolic (Concrete) Communicators	For Abstract Communicators: Words and Language
Interaction strategies (receptive): Support visual gestures with anticipation cues (depending on learner, can be visual, tactile, auditory)	Use 3-D or 2-D tangible symbols (depending on level of iconicity needed); If using 2-D, use photos NOT line drawings for concrete communicators; Adapt/highlight salient features of photos.	Voice output devices and dynamic displays: Displays may have increasingly complex arrays; May require increased adaptation to highlight salient features of target for each symbol used
Visually concrete tangible symbols for anticipation: Increase complexity of target (items with 6-8 colors and patterns); provide receptive exposure to 2-D images but do not use as primary expressive mode	Teach visual discrimination, recognition and identification of familiar and novel items using tangible symbols as categories for sorting and referring to these items	iPads and tablets: May use in conjunction with multiple modes of communication with increased complexity of array and target; May use as dynamic communication device, and also for literacy, games and activities
Consistently highlight salient features on partial or whole objects that concretely represent preferred activities, events, people	Introduce learner to a wider range of partial and whole objects while emphasizing the salient visual features connecting them conceptually	Assess specific need for presenting 2-D images with color highlights, frames, and occluders; May benefit from outlining large print words with color (bubbling)
Considerations for receptive and modeled sign language: Visual sign at increased distance, with reduced complexity of backdrop including clothing and background.		

¹ Complete **The CVI Range (Roman, 2007)** before using this tool and use results to plan intervention.

² Use the CVI Phase III Extension Chart (Roman, 2007) to determine the learner's ability to visually discriminate, recognize and identify targets on AAC. For presymbolic or emerging symbolic learners, see above recommendations for scaffolding concept development prerequisite to these visual skills.