

Table 1: CVI Profile Categories

Possible effects of CVI for children of all ages, with additional possibilities for children aged 2 years and older

Clarity of Vision	
•	Visual acuity – the ability to see details clearly can be compromised, but vision can be normal or near normal in some children with CVI. Visual acuity reaches 20/100 to 20/20 by about 6 months of age in typical infants.
•	Contrast sensitivity – the ability to see differences in adjacent shades of gray, which reaches adult levels by 3 years of age, can be compromised.
•	Accommodation issues – the ability to see details clearly at very close distances, which improves significantly by 3 months of age in typical infants, can be compromised.
Area of Vision	
•	Visual field – the area of vision can be compromised. In typical infants, the effective visual field expands between 2 and 4 months of age and reaches adult levels between 17 and 30 months of age; but in using standardized testing, adult levels are not reached until the age of 10-12 years. For adults, with both eyes open and looking straight ahead at point of fixation, visual fields extend about 95 degrees to each side, 50 degrees above, and 60 degrees below. Children born prematurely with periventricular leukomalacia may have a reduced lower visual field.
•	Usual viewing distance – many young children prefer to look at things within arm's reach at early ages due to immature visual capabilities and attention. This is not a characteristic of only children with CVI. In children with typical vision, this preferred distance increases over time as children's visual systems mature.
•	Usual area of visual attention – some children tend to typically look in a certain area of vision when observing the environment and things within it.
•	Field of view size - size of the viewing area needs to be small enough for things to be seen as a whole for children who have simultanagnosia. Some children may prefer to view things on smaller screens rather than larger ones, for example. The preferred size of the viewing area should be individually determined and may sometimes be the size of a screen on a smart phone.

Visual neglect – inattention to things in an intact portion of the visual field. This inattention relates to the midline of the body, unlike the visual fields that relate to the head and eyes. (This needs to be distinguished from esotropia where children may use the left eye to track from midline to the right, the right eye to track from midline to the left, and head movements to track laterally as the nose begins to impede viewing.)
Blindsight – ability to respond to objects, particularly those that are moving, that are not consciously seen. In children, this may be to objects moving in the periphery of the “non-seeing” visual field.
Following People or Objects Visually Due to Eye Movement Limitations or Visual Field Restrictions
Smooth pursuit eye movements – cannot follow moving objects in circular, horizontal, or vertical directions.
Inattention – cannot attend to objects at the periphery of the intact visual field.
Cannot follow objects as they move across midline of the head – may make adjustments such as changing the eye that is fixating or making head movements to locate moving target. The underlying cause must be determined – a visual field impairment (e.g., hemianopia) or other visual issue with the help of an eye doctor.
Cannot follow objects as they move across midline of the body – suggests hemianopic inattention (i.e., visual neglect).
Lack of spontaneous saccades – fast eye movements from one visual target to another are compromised. One reason to be investigated with the help of an eye doctor is that surrounding targets are unseen (which aged-matched children would see) and is indicative of apraxia of gaze (i.e., lack of visually driven eye movements), and hence, simultanagnosia/simultanagnostic vision (i.e., cannot see more than one or two items in visual scene at one time). In infants, gaze shift is not present. Behaviorally, toddlers with this issue move toward whatever their gaze randomly lands on. When bored, they randomly shift gaze and move toward the new random target. They may gaze at lights. NOTE: This should be evaluated for children who have lower visual field impairment and/or inaccurate visual guidance of movement. Interventions require attention to simple, single, and sometimes prolonged events to maintain attention. There are other possible causes for this behavior that should be evaluated by an eye doctor.
Locating People or Objects Visually/Visual Search Capabilities
Cannot locate and attend to an object or person entering the intact field of view – indication that they have not been seen due to simultanagnosia or attentional issues.
Shift of gaze – cannot move eyes from one object to another due to oculomotor issues (apraxia of gaze) where the child may not be able to move his/her eyes to an “obvious” target nominated by someone else since child cannot see more than one or two objects at a time.

Simultanagnosia – only able to locate and identify a few objects/people at a time when presented with a group of objects or people, accompanied by the ability to move the eyes only to items seen, but not to those that are not seen (apraxia of gaze).	
<i>*For children 2 years and older:</i>	Cannot detect differences in textures of adjacent surfaces accurately (e.g., line where carpeted floor ends and wood floor starts may be erroneously thought to be a drop-off).
Response to Faces	
Cannot recognize faces or facial expressions. This may be completely absent or partially affected.	
Cannot recognize specific faces when out of typical context. This may be completely absent or partially affected.	
Cannot recognize specific facial features or objects on faces. This may be completely absent or partially affected.	
Cannot follow fast-moving facial expressions.	
Cannot look at a face and listen at the same time (looking away during conversation).	
Recognition of Objects or Symbols	
<i>*For children 2 years and older:</i>	Cannot perceive specific pictures, shapes, symbols, or letters/words/numbers. This may apply to specific pictures or letters, for example, or to all pictures or letters.
Responses to Movement	
Responds more consistently to moving objects.	
Responds more consistently to stationary objects.	
Cannot follow fast movement in specific or all parts of visual field. This includes following gestures or sign language. Speed of movement required to be visible varies with each child as some children can follow slower movements.	
Accuracy of Visual Motor Planning and Control	
Cannot coordinate visually guided eye-hand movements to achieve movement goal (associated with a dorsal stream disorder). May be noted in movements performed in the lower visual field but not with movements in upper visual field.	
Improvement of visually guided eye-hand movements when part of the body is in contact with the surface upon which an object being reached for is placed (tactile supplementation of impaired visual guidance).	
Walks (or moves if cannot walk) into objects when engaged in conversation.	

<i>*For children 2 years and older:</i>	Cannot make visually guided eye-hand judgments about object size (e.g., the reaching hand does not conform accurately to size of object in planned reach and grasp) (associated with a dorsal stream disorder).
Imitation and Copying	
Cannot imitate specific movements such as gestures, other body motions, or movements with toys.	
<i>*For children 2 years and older:</i>	Cannot imitate drawing motions.
	Cannot trace symbols without immediate demonstration of movements.
	Cannot copy shapes, forms freehand without immediate demonstration of movements (letters or words for older children).
	Cannot trace or copy lines in specific orientations without immediate demonstration of movements (e.g., horizontal, vertical, slanted).
Color	
Can distinguish primary colors but may require contrasting background color to differentiate them.	
Shows preference for specific color(s).	
Cannot distinguish less saturated colors.	
<i>*For children 2 years and older:</i>	Cannot name colors although can perceive/differentiate when asked to distinguish them by pairing or sorting colors of equivalent color saturation (i.e., color anomia).
Depth Perception	
	Looming – Becomes frightened of approaching objects and people, even dodging to avoid moving targets at some distance away. (This behavior is diminished if there is a tray on the wheelchair or the child is pushing a wheeled toy).
<i>*For children 2 years and older:</i>	Stereopsis can be compromised, especially if strabismus is present (i.e., eyes are misaligned). The subjective experience of depth is created when the two eyes send slightly different signals to the brain. Stereopsis can be difficult to determine through current test procedures for children under 2 years.

	Cannot process motoric depth perception cues despite intact stereopsis (e.g., probes floor boundaries with a foot to check for a step, despite looking at the boundary, or reaches above a picture of a butterfly on a plate to pick it up).
Illumination	
	Use of vision improves in bright light.
	Use of vision improves in dim light.
	Cannot adapt in timely fashion from bright to dim light or vice versa.
	Aversion to light (photophobia).
	Light gazing – drawn to maintain gaze for extended period at strong sources of light. This may be indicative of simultanagnostic vision.
	Responds to “pop out” effect of strong light cue coming from an object.
Response to Sounds	
	Cannot identify the direction of sound source (sound localization).
	Shows speech preference for slow paced speech with prolongation of all consonants as well as vowels, with modulated pitch to engage child’s attention and to convey meaning. Stills and shows engagement when voice is progressively slowed in this way, but this is lost when the voice speeds up once more.
Response to Environment	
	Crowding in environment affects performance. Functions more effectively in less crowded environment where objects or people are clearly defined and spaced apart.
	Familiarity with environment improves performance. Relaxed in known environments (even crowded ones), but distressed in novel environments, especially crowded ones.
	Difficulty navigating in environment or going from room to room, or remembering where items have been placed
Effects of Visual Novelty	
	Pays little attention to novel items.
	Requires novel items and presentation modes due to stimulus habituation effects where child becomes less interested in looking at the same object or person during an activity.
Response Time	

- | |
|---|
| <ul style="list-style-type: none">• Requires additional time to gather, process, and respond to sensory input, particularly if input is coming in quickly or from competing sensory channels. |
| <ul style="list-style-type: none">• Visual and/or auditory input may need to be slowed down to a rate that fits child's ability to process and respond to it. |

CVI PROFILE FORM

Child's Name _____
Date of Entry _____

Birthdate _____
Recorder _____

This profile form has two parts.

The first part can be used to collect and organize data to create a CVI Profile in the *CVI Companion Guide*. Evidence can come from medical history and records, observation, interview, and both formal and informal assessments determined to be most relevant for each child. Care must be taken to consider all the categories listed whenever possible. Categories that can be more readily detected in children 2 years and older are marked with an asterisk* and written in italics. Not all areas will apply to a particular child. This part is useful to gain a detailed understanding of how CVI affects a child's development and functional vision use.

The second part summarizes the data to present a CVI Profile for a child and lists areas to monitor and to target for intervention (either instruction or accommodation). This part is useful for summarizing how CVI affects the child and what can be done about it.

Part 1: DATA COLLECTION

Category	Describe Evidence from Medical Records, Interview and History Taking	Describe Evidence from Formal and Informal Assessment	Describe Evidence from Observation (specify environment)
Clarity of Vision			
Visual acuity affected			
Contrast sensitivity affected			
Accommodation issues affect performance of tasks at close distance			

Area of Vision			
Visual field affected			
Usual viewing Distance			
Usual area of visual attention			
Field of view size			
Visual neglect: Inattention to things in intact portion of visual field			
Blindsight: Responds to objects that are not consciously seen (List the types of objects viewed, and if the preference changes with habituation to a particular direction of movement)			
Following People or Objects Visually Due to Eye Movement Limitations or Visual Field Restrictions			
Smooth pursuit eye movements: Cannot follow moving objects in circular, horizontal, or vertical directions			
Inattention to objects at periphery of intact visual field			

(specify portion of field not noticed)			
Cannot follow objects as they move across midline of head (suggests hemianopia)			
Cannot follow objects as they move across midline of body (suggests hemianopic inattention, i.e., visual neglect)			
Lack of spontaneous saccades (fast eye movements from one visual target to another) to unseen surrounding target			
Locating People or Objects Visually/Visual Search Capabilities			
Cannot locate and attend to object or person when enters intact field of view			
Cannot move eyes from one object to another due to oculomotor			

issues (apraxia of gaze)			
Only able to locate a few objects/people at a time in a dense group of objects. (i.e., simultanagnosia)			
<i>*Cannot detect differences in textures of adjacent surfaces</i>			
Response to Faces			
Cannot recognize faces or facial expressions (absent or partially affected)			
Cannot recognize specific faces when out of typical context (absent or partially affected)			
Cannot recognize specific facial features or objects on faces (absent or partially affected)			
Cannot follow fast-moving facial expressions impaired			
Cannot look at a face and listen at the same time (i.e., looks away			

during conversation)			
Recognition of Objects or Symbols			
<i>*Cannot perceive specific pictures, shapes, symbols, or letters/words/ numbers for older children or pictures or letters, or to all pictures or letters</i>			
Responses to Movement			
More consistent response to moving objects			
More consistent response to stationary objects			
Cannot follow fast movement in specific or all parts of visual field (specify). May be able to follow slower movements.			
Accuracy of Visual Motor Planning and Control			
Cannot coordinate eye-hand movements to achieve movement goal (dorsal stream issue)			
Improved eye-hand movements when part of body contacts			

surface where object to be reached for is placed			
Walks (or moves) into objects when engaged in conversation			
<i>*Cannot make eye-hand judgments about object size (e.g., hand does not conform accurately to size of object in planned visually guided reach & grasp) (dorsal stream issue)</i>			
Imitation and Copying			
Cannot imitate specific movements such as gestures or movements with toys			
<i>*Cannot imitate drawing motions</i>			
<i>*Cannot trace symbols without immediate demonstration of movements</i>			
<i>*Cannot copy shapes, forms, freehand without immediate demonstration of movements</i>			

<i>(letters or words for older children)</i>			
<i>*Cannot trace or copy lines in specific orientations without immediate demonstration of movements (e.g., horizontal, vertical, slanted)</i>			
Color			
Can distinguish primary colors (specify colors) but may need contrasting background color			
Shows preference for specific color(s) (specify colors)			
Cannot distinguish less saturated colors (specify colors)			
<i>*Cannot name colors although can perceive/differentiate in other ways (e.g., sorting, matching): color anomia; specify color(s)</i>			
Depth Perception			

<i>Frightened by objects or people that are approaching - looming</i>			
<i>*Stereopsis compromised</i>			
<i>*Cannot motoric process depth perception cues despite intact stereopsis</i>			
Illumination			
Use of vision improves in bright light			
Use of vision improves in dim light			
Cannot adapt in timely fashion from bright to dim light or vice versa			
Aversion to light (photophobia)			
Drawn to maintain gaze for extended period at strong sources of light - light gazing			
Responds to "pop out" effect of strong light cue coming from an object			
Response to Sounds			
Cannot identify the direction of			

sound source (sound localization)			
Shows speech preference for slow-paced speech with prolonged vowels, consonants, and modulated pitch			
Response to Environment			
Appears less stressed in quiet environment (e.g., quiets or stills) or becomes more stressed (e.g., fussy or fearful) in busy environment due to sensory overload			
Functions more effectively in less crowded environment where objects or people are clearly defined and spaced apart			
Relaxed in known environment (even crowded ones) but distressed in novel environments, especially crowded ones			

Difficulty navigating in environment or going from room to room, or remembering where items have been placed			
Effects of Visual Novelty			
Pays little attention to novel items			
Requires novel items and presentation modes due to stimulus habituation effects			
Response Time			
Requires additional time to gather, process, and respond to sensory input, particularly fast input from competing sensory channels			
Visual and/or auditory input may need to be slowed down to a rate that fits child's ability to process and respond to it			

Part 2: CVI PROFILE SUMMARY AND INTERVENTION GUIDE

Child's Name _____
Date of Entry _____

Birthdate _____
Recorder _____

CVI Manifestations How does CVI affect the child's function?	CVI Profile Areas to Monitor and/or Target for Intervention How do we design appropriate interventions within daily routines or activities? Consider: Instruction (if possible) or Accommodation
	☐ Monitor Target for: ☐ Instruction ☐ Accommodation
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	☐ Monitor Target for: ☐ Instruction ☐ Accommodation

Questions to Obtain Information About A Child's Use of Sensory Information

Through observation and discussion with caregivers, the following questions provide a way to determine how a child uses sensory information:

Sight

- How does the child respond to the caregiver's face?
- What types of visual stimuli attract the child's visual attention?
- How does the child respond to stationary compared to moving targets?
- What makes a difference in the child's visual responsiveness?
- What types of lighting situations help the child attend and participate?
- Do bright lights distract the child from attending to the main part of a play situation or structured learning task? Does the child "lock on" to a light source rather than the main part of a play situation or structured learning task?
- Do bright lights overwhelm the child, causing him or her to "shut down"?

Sound

- Does the child accurately and consistently locate the direction of sound sources?
- Does the use of sound distract and confuse the child or does it support his or her learning?
- What types of sounds irritate the child?
- What types of sounds help the child become calm and attentive?
- Does the child respond immediately to sounds or speech or is there a delay in the child's response?
- How does the child respond to typical fast-rate speech compared to speech with a slow deliberate tempo and melodic pitch?
- What makes a difference in the child's auditory responsiveness?

Touch

- Is the child overly sensitive (over responsivity) to different types of textures? If so, textural input should be addressed carefully so that it enhances and does not distract the child from interactions with objects and people. Suggestions to work with tactile sensitivity can be found in the [Considerations section of Fine Motor Development in Developmental Guidelines p. 148](#).
- What types of touch irritate the child?
- What types of touch help the child become calm and attentive?
- Is there a part of the body that is particularly oversensitive to touch?

Multiple Modalities

- How does the child use his or her vision, touch, and hearing?
 - Which seems to be the strongest sense for obtaining information?

- What senses seem to be used simultaneously?
- What senses seem to be used sequentially?
- What combinations of sight, sound, and touch help the child to interact and participate?
- What combinations of sight, sound, and touch irritate the child?

Interview Questions to Gather CVI Profile Information

Begin with open-ended questions as a starting point before asking further, more directed questions. Many items on the CVI Profile will likely be addressed by responses to these questions. *Questions specific to children 2 years and older are marked with an asterisk and written in italics.*

Open-Ended Questions

- Tell me about your child's vision.
- What does your child see?
- What are your child's favorite things to look at?
- What are your child's favorite things to do?
- How does your child search for things?
- What are your major concerns about your child's vision?

Below are some examples of additional questions that can be asked to address more specific areas of the CVI Profile that may not be covered by the general questions. Before asking these questions, please consider the following:

- These questions can be used to learn more details about a particular category in the CVI Profile.
- Not all the questions need to be included in the inventory when sufficient information is already available or the category does not apply to a particular child.
- Some of the questions may provide information about more than one CVI Profile category, but they are listed in one area for ease of administration.
- Whenever possible, consider gathering information to answer these questions using a conversational approach with caregivers rather than a formal interview format.
- Some of the questions may also be helpful to guide observations of the child.

Additional, More Directed Questions

Clarity of Vision

- How does your child pay attention to things up close using vision?
- How does your child pay attention to things using vision that are far away?
 - How far away?
- Does your child prefer to see things in any specific direction or at any specific distance?

Area of Vision and Response to Movement

- How does your child follow something that is moving from one side to the other such as a spoon when being fed?
- How does your child pay attention to things that are moving

- from the sides (which side)?
 - from above?
 - from below?
- Does your child usually visually find things that he or she wants that are located
 - left,
 - right,
 - above, or
 - below him or her?

Visual Following/Locating

- Does your child hold his or her head in any specific ways to see better?
- How does your child use vision to follow people as they move around the room? At what distance?
- How does your child find objects that are located on a surface with a busy background?
- How does your child find objects that are spaced apart on a plain surface or uncluttered background?
- How does your child find you using vision when you are in a group of people?
- How does your child find a favorite toy that is in a toy box or next to many other toys?

Faces

- Does your child use vision to respond to your face when you haven't spoken? At what distance are you from your child?
- Does your child use vision to respond to your facial expressions, such as a smile, frown, or wide-open mouth? At what distance are you from your child?

****Objects/ Symbols (ask as age appropriate)***

- **Please describe how your child recognizes the following:*
 - *Familiar objects*
 - *Pictures*
 - *Shapes*
 - *Letters*
 - *Numbers*
 - *Words*

Eye-Hand or Eye-Foot Coordination

- Please describe how your child reaches with hands or feet to touch objects.
- **Please describe how your child reaches and grasps for objects he or she likes.*

Imitation/Copying

- Please describe how your child copies any of your gestures or the motions you make with toys?
- **How does your child (ask as age appropriate)*
 - *imitate drawing motions?*
 - *trace symbols?*
 - *copy shapes?*
 - *trace or draw lines going in different directions?*

Colors

- What colors does your child see?
- Does your child prefer a specific color or colors? Which one(s)?
- **Does your child recognize any colors that you name?*
- **Does your child name any colors?*

Depth Perception

- **How does your child go up the stairs and go down the stairs?*
- **How does your child move from a carpet to linoleum or from one type of surface texture to another?*
- *Does your child hold onto your arm or clothes on uneven surfaces?*
- *How does your child react to fast-moving objects as they come closer?*

Lighting

- Please describe the type of lighting where your child sees best.
- How does your child respond to an object that has a built-in light?
- Does your child look toward strong lights? Look away from strong lights?
- Does your child like to look at objects when they are placed on a light box or other strong background light? If so, please describe.

Sounds

- How does your child respond to familiar sounds such as his or her name, a family member's voice, or sound of a family pet?
- Does your child turn in the direction of a source of sound or indicate in some way the direction of a source of sound?
- What differences have you noticed in your child's responses when you speak slowly and with rhythmic intonation rather than in a faster, typical speech pattern?

Environment

- How does your child respond in a quiet place such as an uncrowded park compared to a busy grocery store?

- How does your child use vision to follow people or objects that are spaced apart compared to those that are crowded together?
- Does your child find his or her way when walking around
 - from room to room in the house?
 - outside?
- Does your child know where to find things that he or she has placed in areas around the house?

Visual Novelty

- What happens when your child tires of an activity with a toy or person?
- How does your child respond when an activity that no longer holds his or her interest is changed?
- How does your child interact with familiar objects, people, or in familiar places compared to unfamiliar objects, people or places?

Response Time

- Does your child respond quickly or does he or she need more time to respond to
 - sights?
 - sounds?
 - touches?
- How much time does your child need to respond?