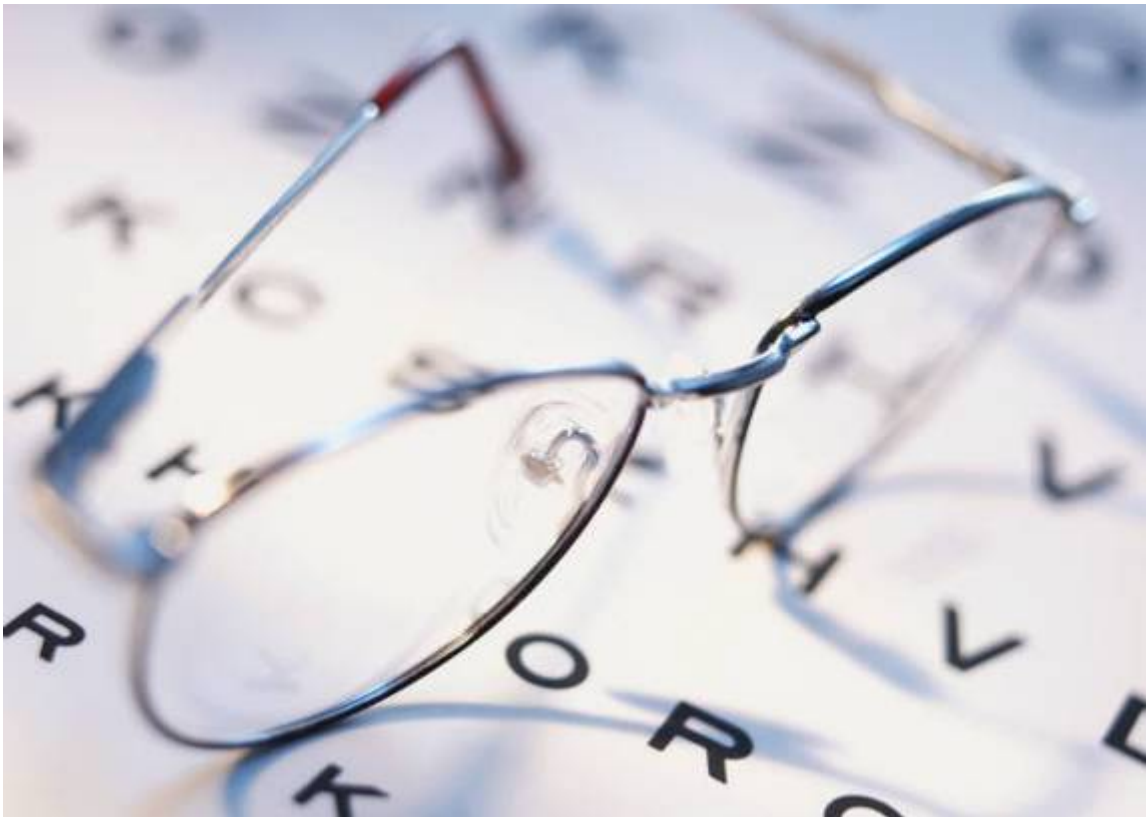


VISION.....

WHAT TO LOOK FOR...

And what to do about it.....

An overview of Vision and how it affects development, including an overview of Cortical Visual Impairment



VISION, WHAT TO LOOK FOR OUTLINE

TIME: APPROXIMATELY 1-1½ HRS
POWERPOINT PRESENTATION AVAILABLE

Participants will be given an overview of vision concerns and visual difficulties that could affect our population of students.

Participants should also have the opportunity to experience some visual difficulties/ limitations to understand better how our students may be seeing

1. THE EYE - parts of the eye and how they work
2. DEFINITION OF VISION - what it is
3. VISION AND DEVELOPMENT - how vision impacts our overall development
4. SOME INTERESTING FACTS ABOUT VISUAL IMPAIRMENT
5. VISUAL MATURATION OCCURS IN A DEVELOPMENTAL PATTERN - discussion and how normal vision develops
6. VISUAL IMPAIRMENT - blindness, low vision
7. CORTICAL (CEREBRAL) VISUAL IMPAIRMENT - what is it? CVI and current definitions; Christina Roman and the CVI matrix; Dorsal and Ventral Stream CVI difficulties (Gordon Dutton)
8. THE IMPORTANCE OF POSITIONING
9. THINGS TO REMEMBER WHEN PRESENTING VISUAL INFORMATION TO OUR STUDENT POPULATION

Your Handout Package Will Include The Following:

- Agenda/Outline
- Powerpoint (print for note taking)
- How Vision Affects Development
- How Vision Develops
- Cortical Visual Impairment
- Adapted CVI Matrix (2 pgs)
- Resources For Children With Vision Impairment

INSERT POWERPOINT OUTLINE HERE

...WITH 3 PICTURES PER PAGE AND LINES FOR PARTICIPANTS TO JOT
DOWN THEIR NOTES ON THE OTHER SIDE OF THE PAGE.

HOW VISION AFFECTS DEVELOPMENT

Cognition

Object knowledge - objects may be randomly encountered in a fragmented form
Object Permanence- restricted access limits development and building on interactions
Cause and Effect- visual reward from toys and play activities is reduced and not as stimulating
Spatial relations - visual comparison is lost with positional change dependent upon touch
Concept development - direct interaction with real world objects is needed with intervention required of the many things that sighted children observe and learn on their own

Communication

Difficulties occur in deciphering nonverbal communication (gestures, expressions, body language) and social norms (eye contact, direct attention to person speaking).
Delay in language acquisition is often present and due to lack of experience in seeing objects and interactions.
Concepts and vocabulary need to be learned in real life context with opportunities for multi-sensory exploration and understanding.
Focus of self as topic is common.
Children often imitate sections of speech in echolalic fashion with delay in progression.

Gross Motor Development

Infants with visual impairment are often passive and need intervention to purposefully explore.
The sequence of developmental milestones appears similar to sighted children with some fragmented delay, (late on-set of unaided walking) which may be offset by intervention.
Generalized hypotonia, particularly in the trunk and upper extremities, with resistance to lying or pushing up from prone.
Delayed and/or immature protective and equilibrium responses are used.
Poor trunk rotation is often seen, resulting in fixed or abnormal movement patterns.

Fine Motor Development

Mouth remains a primary sensory organ for a longer period of time.
Generalized upper extremity weakness.
Tactile hesitancy - reduced use of hands for purposeful, structured exploration and interaction.
Often see delays in self-care and activities of daily living.
Vision skills - coordination difficulties occur in school particularly associated with deskwork.

Social-Emotional Development

Binding may be more difficult to establish due to delay in interpreting baby's non-verbal signals as well as frequent incidence of pre-maturity.
Child often more dependent upon caregiver to introduce and facilitate interaction in the world. Infants with visual impairment often passive and at risk for 'good fairy' syndrome.

Atypical behaviour (rocking, eye pressing, flapping) and lack of knowledge relating to social 'norms' (personal space) may restrict interaction with others.

THANKS TO THE VISUAL IMPAIRMENT CLINIC AT QUEEN ALEXANDRA CENTER FOR CHILDREN'S HEALTH

HOW VISION DEVELOPS

Vision develops in an orderly manner and improves over time as the child learns to make sense of what he or she sees. It is helpful to understand the normal sequences of visual development. This will make it easier to identify what is abnormal as well as what visual skills the child will need help learning. When looking at the normal visual sequences, it is clear that the brain and motor systems must work together with the eyes in order for vision to be effective. Where the child functions in this continuum of visual skills will more closely approximate their overall developmental level rather than their actual age level.

The Visual Response Continuum

(Note: The principles and progression described below are reprinted with permission from the publisher of *Reach Out and Teach Parent Handbook*, Chapter 6, pages 180-184, Kay Alicyn Ferrell, Ph.D., 1985, the American Foundation for the Blind. *Reach Out and Teach* is a complete package of developmental materials for parents and teachers of infants and children with visual and multiple disabilities. The package consists of a Parent Handbook, a Reachbook (workbook), eight slide/tape presentations, and a Teacher's Manual. For further information, write to the publisher, American Foundation for the Blind, 15 West 16th Street, New York, NY 10011.)

There are nine general principles that describe how children respond visually to their world. Each principle is a continuum, or range of responses, starting with the most basic or minimal response and leading up to the highest level of response that can be expected. Individual children will respond at any point along each continuum and will usually be at different points in each. Children with visual and/or multiple disabilities will follow each continuum to a greater or lesser degree. That is, they may respond at one end of the continuum, but have difficulty moving to the other end, or be unable to move to the other end because of their eye condition.

Awareness → Attention → Understanding

A child will be aware of lights and people or objects before he or she will pay attention to them and before he or she can understand and interpret what it is he or she is seeing. This explains why an infant will close his or her eyes when the lights are turned on, but will not recognize his or her parents until he or she is older.

Lights → People → Objects

A child will react to lights before he or she will react visually to the face of his or her parents and to his or her toys. Infants will focus in on lights but they will not pay attention to the toys in their cribs until they are older.

Fixation → Shifting → Tracking

A child will *fixate*, or focus, on lights and people or objects before he or she will be able to follow them as they move. Children have to be able to maintain their focus without moving their eyes before they can focus and move their eyes at the same time.

Near → Far

A child will respond to lights and people or objects that are close to him or her before responding to those that are farther away. A baby's ability to focus at different distances depends on the ability of the lens of the eye to change shape (and thus focus), and on the ability of the muscles of each eye to work together to focus at the same point. Like the muscles responsible for gross motor and fine motor skills, the eye muscles at first are fairly tight. With use, they become more flexible and can adjust to focus at greater and greater distances.

Peripheral → Central

A child will respond to lights and people or objects located in the outer portions of his or her visual field (the periphery) before he or she responds to those in his or her central field. This explains why infants sometimes do not seem to see a toy placed directly in front of them, but do seem to focus on it when it's slightly off-center.

Familiar → Unfamiliar

A child will respond visually to those things in his or her world that are familiar to him or her before responding to something new or unfamiliar. Eventually he or she will *prefer* to look at new things. This explains why babies seem to avoid looking at anyone other than their parents in the first couple of months and then seem fascinated by new faces.

Parts → Wholes

A child will look at *parts* of faces and objects before he or she can see the *whole* face or object *all at one time*. When being cradled in the arms, for example, newborns are actually looking at the hairline or eyes of faces (places of high contrast) and not seeing the entire face. Later, they begin to see the *whole* face, and not just parts. This explains why babies don't recognize their parents as being different from anyone else until they are five months or older.

Simple → Complex

A child will respond first to simple patterns before he or she will respond to more complex patterns. Younger babies will first prefer to look at things that are plain and simple, such as a toy of one or two colors, a quilt of solid color patches, a soft fuzzy patchwork ball, a stuffed panda, or a music box mounted on the crib slats. Later, mobiles, crib gyms, and busy boxes become more interesting to look at. This also explains why a rattle placed on a patterned crib sheet may not be seen, because there is too much complexity in the visual field and the child is not able to separate the *figure* (the toy) from the *ground* (the sheet).

Large → Small

A child will respond to large patterns and objects before he or she responds to smaller ones. So he or she will pay attention to a large ball before he or she pays attention to a small ball. For example, if you show a young baby two checkerboards of different sizes but of the same color and number of squares, he or she will look longer at the larger checkerboard. Later he or she will prefer the smaller one.

Depending on the eye condition, the large to small continuum may not apply to children with visual impairments. If there is a field loss, a large object may be so large that all the child sees is one solid color with no lines or contours. If the child has a central loss, a small object may be missed altogether.

This visual response continuum has value only insofar as it helps one to understand what the child is seeing and how the caregiver might help him or her to see more. Below are a few examples of how this continuum may be applied.

If the child seems to be *aware* of lights but does not *track* or *follow* them, start the activities by:

- Working on fixation or focusing (Fixation → Tracking)
- on unmoving lights (Lights → Objects)
- presented close (7-9 inches) to his or her face (Near → Far)
- and slightly off-center (Peripheral → Central)

Vision

If the child seems to *focus* on and know the parents, *tracks* or follows them with his or her eyes when they walk away from him or her, but doesn't look at the toys in his or her crib, then:

- Work on fixation or focusing (Fixation → Tracking)
- on one large toy (Lights → People and Objects) (Simple → Complex)
- (Large → Small)
- presented close to his or her body (Near → Far)
- in a crib with solid-colored sheets, or when lying on a solid-colored blanket on the floor (Simple → Complex)

Once he or she looks or focuses on the toy in this situation, then:

- Move the toy slowly (Fixation → Tracking)

When he or she follows the toy, then:

- Move the toy (Fixation → Tracking)
- further away (Near → Far)

Once the child is able to track a toy that is not close to his or her face, then:

- Try fixation (Fixation → Tracking)
- on another toy (Familiar → Unfamiliar)

There is no set formula for how to use this continuum, except to think of all the response possibilities as *guidelines* for activities and expectations.



Points To Remember

1. Vision develops in an orderly manner and improves over time as the child learns to make sense of what he or she sees.
2. There are nine principles that describe how children respond visually to their world. Each principle is a continuum, or range of responses, starting with the most basic response and leading to the highest level of response.
3. Children with visual and/or multiple disabilities will follow each continuum to a greater or lesser degree.

CORTICAL VISUAL IMPAIRMENT (CVI)

Cortical Visual Impairment is a condition that indicates that the visual systems of the brain do not consistently understand or interpret what the eye sees. Individuals with CVI have difficulty processing visual information. It is important to remember that vision is learned. Students with CVI should receive periodic functional vision assessments to document progress along the continuum.

CHARACTERISTICS OF CORTICAL VISUAL IMPAIRMENT:

- Short visual attention span
- Visual functioning is highly variable
- Require longer processing time
- Often a tendency to light gaze
- Expect fluctuation in vision due to fatigue, stress, illness
- Familiar items and people part of daily routine are "seen" easier
- Many students with CVI may be able to use their peripheral vision more effectively than their central vision
- Color vision is usually preserved in children with CVI, especially yellows, oranges and/or reds (this is a relatively simple neurological task compared to shape discrimination)
- Vision may be better when either the target or the student is moving
- Most students with CVI have problems differentiating between foreground and background information
- Spatial confusion is common
- Students with CVI appear to have difficulty seeing objects or pictures placed close together (crowding effect), but can identify the objects when they are spaced further apart
- Students with CVI can be compared to sighted individuals who are looking at an incomplete drawing
- Some students are very sensitive to bright lights

PRESENTATION OF MATERIALS:

- **Seating** and/or **positioning** of the student is very important so that they can benefit from what residual sight they have. Good positioning for the student with physical challenges helps them to direct their energy into "seeing/processing visual information" versus directing energy toward maintaining and/or strengthening good body positioning.
- Tell the student what they are seeing; **verbal** and **tactile cueing** can help provide perceptual organization and develop concepts to complete the picture. **Tell** the student what they are seeing and have the student **touch** what they are seeing.
- Present visual materials in a **simple, consistent** and **predictable format**. The student with CVI will see **familiar objects** better than unfamiliar ones.

- Students with CVI can make more sense out of what they are seeing if it is in **context**.
- Keep the visual **stimulus simple** (avoiding items with lots of detailed patterns).
- Avoid "**visual overloading**" (e.g. one object at a time or several that are well spaced apart).
- Keep work area free of **clutter**.
- **Moving objects** are often seen better, versus stationary objects.
- Utilizing persons, objects and events that are intrinsically important and rewarding to the student will provide motivation to associate information with an experience and will provide a basis of understanding.
- Provide **contrast** between object and background (e.g. white on black or blue on yellow).
- Use **bright primary colors** (red and yellow attract attention).
- Natural **lighting** diffuses light and enhances contrast.
- Position the student with their **back to the window** and natural light coming from behind them onto the object.
- Avoid **glare** caused by reflective surfaces.
- Present materials at **eye level**.
- **Size:** If the visual display is too large the student may only see fragmented parts of the whole.
- Present objects at **close viewing** distance, e.g. 12-18 inches.
- Provide additional **processing time**.
- **Highlight** the area you want to focus on.

INTERNET RESOURCES

Texas School for the Blind (many links) <http://www.tsbvi.edu>

Technology Guide to Assist Students with Visual Impairments
<http://www.setbc.org/special/virg/>

Vision Products/Resources <http://www.blind.net/bcompany.html>

Support Organizations <http://www.cnib.ca/>

Other <http://www.tsbvi.edu/Education/books.htm>

Information compiled by the PISP Team; Margot White, Vision Resource Teacher, S.D. #43, Coquitlam; The Canadian National Institute for the Blind.

INSERT CVI MATRIX OF SKILLS HERE

RESOURCES FOR CHILDREN WITH VISION IMPAIRMENT

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Vision Products/Resources <http://www.blind.net/bcompany.html>

Toys <http://www.toy-tma.com/PUBLICATIONS/guide98/index.htm> vi toys

Index of Equipment <http://www.dftoys.com/webdragonca/main.ncl> toys for special needs

Support Organizations <http://www.cnib.ca/>

Others <http://www.tsbvi.edu/Education/books.htm> (books featuring characters who are vi)

MATERIALS

American Printing House for the Blind
1839 Frankfort Avenue,
P.O. Box 6085
Louisville, Ky 40206-0085
800-223-1839
E-mail: info@aph.org

- On the Way to Literacy: Early Experiences for VI Children
- Storybooks with real objects and textures
- Developmental Guidelines for Infants with VI
- Preschool Activities Calendar

Blind Children's Centre
4120 Marathon Street,
P.O Box 29159
Los Angeles, California 90029-0159

- Talk to Me I & II booklets and other information

Texas School for the Blind
1100 W. 45th St.,
Austin, Texas 78756

- Communication: A Resource Guide for Teaching Students with Visual and Multiple Impairments (1997)
- Assessment Kit: Informal Tools for Academic Students with Vision impairment
- Language Assessment and Intervention with Children who have Vision Impairment (booklet 1998)