Perkins School for the Blind

Supporting School-Based Access with Visual Impairments:

OT Interventions, Adaptations, and Best Practices

Supporting School-Based Access with VI:
OT Interventions, Adaptations, and Best Practices

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Introduction

Perkins School for the Blind

- Watertown, MA
- Ages: Birth to 22
- Across visual spectrum:
  - Low Vision
  - Blindness
  - MDVI
  - Deafblind

Needs Assessment

- ~750,000 school-aged children in US affected by VI[7]
  - Most commonly affected aspect of daily life = education[5]
  - 20% of OTR/Ls in US work in school-based settings[1]
- Limited research to inform best practice
  - Many school-based OTs do not feel comfortable providing services for students with VI due to limited:
    - Years of OT experience
    - Previous history of caseload with VI
    - Training received in treating children with VI[25]

Implication for School-Based OTs

The Individuals with Disabilities Education Act (IDEA) is a statute that mandates **free appropriate education** (FAPE) in the **least restrictive environment** for students with one or more specific physical or mental impairments, who need special education and related services.[12]

Therefore, likely that school-based practitioners will encounter students with VI.

Learning Objectives

1. Understand barriers to participation in education and school-based occupational therapy intervention for students with various visual impairments (cortical/cerebral and ocular).
2. Articulate how visual impairments impact the therapeutic process of evaluation and intervention, and how to apply learned intervention strategies in practice.

Understanding Visual Impairment

Different Categories & Causes

- May be either "ocular" or "cortical"/"cerebral"
- Due to genetic condition/syndrome or external event

High prevalence of misdiagnosis due to lack of diagnostic tools & misconception that VI is strictly an ocular issue![6]

Understanding Visual Impairment

Ocular Visual Impairment	Cortical / Cerebral Visual Impairment
Caused by damage, disease, or condition affecting eye structure and surrounding components	Caused by damage, disease, or condition affecting visual center of brain
Difficulty *seeing*	Difficulty *interpreting*
Downstream processing structures within brain appear to remain intact	Difficulty in function despite normal/near normal eye exams
Functional vision likely to maintain or **decline**	Functional vision likely to maintain or **improve**
Approach focuses on modification / compensation	Approach includes establishing / restoring visual skills

Leading Causes of VI in Children[21]

1. **Cortical/Cerebral Visual Impairment**
   - Brain-based disorder involving visual processing
2. **Retinopathy of Prematurity**
   - Eye disorder affecting premature infants, affects immature blood vessels of the retina, occurs weeks after birth
3. **Optic Nerve Hypoplasia**
   - Underdevelopment of the optic nerve during pregnancy

VI is also common in various other pediatric diagnoses (i.e. CP, Down Syndrome, Autism)

Impact of VI on Function

- Estimated 80% of learning is incidental [11]
- Children with VI may need direct/modified instruction
  - Sensory Processing
  - Gross/Fine Motor
  - Social Participation
  - Self-Concept
  - Play
  - ADLs

Impact of VI on Function

Sensory Processing

- Lack of meaning to tactile, motor, auditory input without visual component[3]
- Lack of visual calibration affects vestibular/prop systems[17]
- Repetitive, stereotypical behaviors can develop due to decreased body awareness[8]

Impact of VI on Function

Motor Development

- Ear-hand coordination develops later than eye-hand coordination (12m vs 2-3m)[14]
- Inhibition to move due to fear/anxiety of unknown
- Less likely to lift heads during “tummy time”
- Impact:
  - Crawling/walking delayed 6m+[3]
  - Manual skills delayed in infancy [4]

Impact of VI on Function

Social Participation

- Unable to pick-up/mimic non-verbal cues[22]
- Appear disinterested, reducing sustained social interaction[22]
- Stereotypical behaviors persist[14]

Impact of VI on Function

Self-Concept

- Child waits for stimuli and encourages passivity and overdependence on others (learned helplessness)
- Control over environment leads to building confidence and positive self-image[14]

Impact of VI on Function

Play

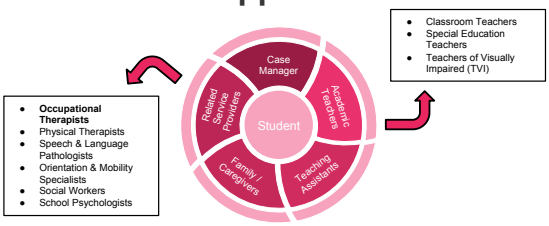
- Lack of incidental learning affects pretend play
- Exploratory/sensory-seeking behaviors may persist (mouthing, waving, shaking)

ADLs

- Participation in routines impacted by lack of incidental learning, learned helplessness, gross and fine motor delays[22]

Expanded Core Curriculum

Team-Based Approach



Screening & Referral

25% of children in US have undiagnosed VI[26]

Observation	Screening	Referral
• Excessive blinking, eye rubbing, head tilting • Positioning chair at angle • Avoidance of near or far tasks	• Reading functional text • Oculomotor skills	• Optometrist • Ophthalmologist

Impact of VI on Evaluations

Most standardized assessments do not account for the unique nature of visual impairment; scores or outcomes will likely not accurately reflect the child's true abilities.[13,19]

Impact of VI on Evaluations

Modifications to Testing

Considerations based on nature of diagnosis [10,18,20]

- Time of day
- Complexity of the environment
- Use of color
- Use of light or backlighting
- Use of familiar materials
- Spacing out visual tasks between non-visual tasks
- Size of materials
- Scribing and/or reading directions aloud

Impact of VI on Evaluations

Focus of Assessments

- How visual challenges impact student functionally in the typical areas of assessment
- Review optometry/ophthalmology/TVI reports to gather information about visual status
- Further assessment of visual skills may be needed, as they relate to function [10,20]
- Visual attention, memory, discrimination, imagery

Screening & Assessment Tools

- EVALS: Evaluating Visually Impaired Students
- Everyday Life: A Guidebook for Teaching Independent Living Skills (ILSA Assessment)
- The Expanded Core Curriculum Needs Screening Tool
- Functional Skills Assessment
- Independent Living: A Curriculum with Adaptations for Students with Visual Impairments
- Michigan Department of Education Independent Living Skills Checklist
- The Oregon Project for Visually Impaired and Blind Preschool Children
- Scales of Independent Behavior-Revised (SIB-R) Short form for the Visually Impaired
- The Sensory Learning Kit
- Total Life Learning: Preparing for Transition. A Curriculum for All Students with Sensory Impairments

Intervention Considerations

Ocular Visual Impairments

1. Contrast
2. Size
3. Light
4. Fields
5. Complexity
6. Tactile/auditory component

https://www.prettyprudent.com/10-things-your-teacher-wants-for-the-classroom/

Intervention Considerations

Visual Behaviors of CVI

1. Appearance of the eye
2. Movement of the eyes
3. Visual attention
4. Access to people
5. Impact of clutter / crowding & Impact of increased spacing and predictability
6. Impact to visual fields
7. Visual guidance of upper limbs
8. Visual guidance of lower limbs
9. Sensory integration while using vision
10. Impact of motion
11. Visual recognition
12. Visual curiosity
13. Response intervals
14. Use of compensatory skills
15. Impact of color
16. Impact of light

Intervention Considerations

Organization of learning space for a student with CVI

Intervention Modifications

Note:
Although some may overlap, accommodations for CVI are often **contradictory** to those for low vision

Intervention Modifications

Low Vision

- Bigger
- Bolder
- High Contrast
- Bright lighting

Source: www.aph.org/

Intervention Modifications

Blindness

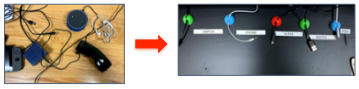
- Multisensory components
- Explicit narrative
- Defined workspace

Source: www.aph.org/

Intervention Modifications

Cortical / Cerebral Visual Impairment

- Processing time
- Saturated colors to gain attention and visual recognition
- Simple background
- Low complexity
- Focal lighting
- Familiar routines
- High contrast materials



VI & Therapeutic Use of Self

A comfortable environment supports student's success

- Student may lack the opportunity for incidental rapport building (smiles, gestures, etc.) [24]
- **Blind Etiquette** is essential to therapeutic rapport
  - Always introduce/identify yourself
  - Narrate environment/actions
  - Use clear, concise, and descriptive language
  - Ask before providing physical assistance
  - Consider sensory sensitivities

VI & Sensory Processing

- Students with VI rely on a variety of sensory inputs
- Additional sensory processing challenges will impact self-regulation & tolerance
  - Sensory supports to facilitate modulation & participation
  - Help your student to learn to self-advocate

Safety with sensory equipment: provide frequent and specific verbal cues for spatial awareness, guarding, sighted guide

VI & Self Regulation

Visually Based Self-Regulation Strategies

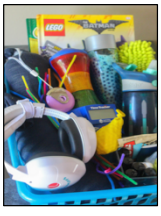
- Visually-centered prompts to understand feeling "dysregulated" vs. "just right"
- May be inaccessible/abstract to students with VI

Source: www.cvsu.org/Page/1595

VI & Self Regulation

Accessible Strategies for VI

- Tangible symbols
- Quick/consistent access to sensory tools
- Alert Program Language



VI & Tactile Discrimination

- Key to access environment and learning materials
- Practice in a non-threatening manner [15]
  - Games (e.g. sensory bins, tactile puzzles)
  - Active learning
  - Give ample time to explore items as independently as possible at their own pace
  - Use descriptive language

Developing Pre-Braille Skills [15]

Level I

- Finger isolation
- Body awareness
- Spatial awareness
- Tactile discrimination
- Recognizing objects tactually

Source:
http://www.pdrib.com/pages/brailactivities.php

Developing Pre-Braille Skills [15]

Level II

- Utilizing tangible symbols
- Tracking/Sequencing
  - Pegboards, Wikki Stix, beads, ice cube trays
- Sorting objects

Level III

- Creating meaningful opportunities for students to explore reading braille and braille words
  - Scavenger hunts, functional labels, recipes

VI & Fine Motor Development

Infants & Toddlers

Exploration & Play

- Tactile exploration + multisensory stimuli
- Active Learning [17]
  - Exploration of grasps
  - Intentional release
  - Finger movement/isolation
- OT role:
  - Describe salient features
  - Help make connections (ie: cause & effect)

VI & Fine Motor Development

School Aged Children

Academic Routines

- Academics:
  - Handwriting
    - Functional signatures vs handwriting
    - Raised/bold paper, tangible letters, multisensory practice
  - Abacus & manipulatives
  - Adapted materials
    - Scissor jack, high-contrast glue stick, 20/20 pen

VI & Fine Motor Development

School Aged Children

Academic Routines

- Accessing technology:
  - Typing:
    - High-contrast/large print/Braille keyboard
    - Braille Notetaker
  - Finger isolation for high-tech devices
- School routines:
  - Practice in context
  - Adapt ADL/IADL for fine motor needs

Keep it Functional!

Students with VI require physical context and direct experience to learn; a motor pattern learned from one activity might not be as easily generalized to another as with sighted students[2]


VS.


VI & Executive Functioning

- Many diagnoses involve executive functioning deficits
- Learned helplessness common
- OT role:
  - Develop routines & adapt systems
    - Organize space, belongings, etc.
  - Create schedules
    - Simple visual, tactile, individualized

VI & Environmental Adaptations [9, 23]

- Key to success in environment is access to the environment
- Priorities = safety and function
  - Orientation to environment
  - Consistency and predictability
  - Organization
  - Function over form
  - Accessible Labeling

Adaptations - Eg. School Lockers

Ocular VI

- Use physical landmarks
- Add tactile or Braille label
- Internal organization system
- Develop storage system for materials & technology

CVI

- Visual cue for locker ID
- Color highlight handle
- Non-complex labels
- Limit clutter to reduce complexity

Adaptations - Eg. Bathrooms

Ocular VI

- Reduce light glare
- Increase appliance contrast
- Store items consistently (step stool, trash)

CVI

- Highlight touch points (faucet, hand dryer) with tape
- Minimize glare
- Lighted or colored soap fixture

VI & Activities of Daily Living

- Intervention Focus
  - Developmentally appropriate
  - Clear expectations
  - Within natural context
- Methods
  - Encourage exploration
  - Provide feedback & salient descriptions throughout
  - Highlight spatial concepts & body awareness

VI & Activities of Daily Living

- Strategies & Tips
  - Scaffolding/errorless learning approach
    - Forward vs. backward chaining; hand-over-hand vs. hand-under-hand; cues
  - Create written routines
    - For staff working with student - level of assist, specific cues
    - Sequence & steps, preferred rhythm
- Be Patient - exposure and repetition are key for motor planning with VI

VI & Telepractice

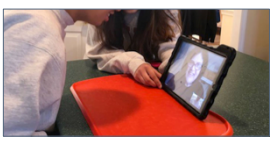
Considerations for remote OT sessions

- Environment/Support
- Planning/Materials
- Presentation/Cues
- Collaboration

VI & Remote Learning

Supporting instructors of students with VI

- Preparation
- Technology
- Collaboration
- Practical Considerations
- Accommodations



VI & Remote Learning

Supporting instructors of students with VI

- Diving into telepractice intervention planning
  - Family and district consent
  - Build relationships and expectations
  - Planning and communication
  - Get to know the technology
- Activities for students with VI
  - Adapt to be non-visual, or use student's accommodations
  - Get creative and individualized
  - Use household tools and natural context

Source: https://www.walmart.com/ip/Measuring-Cups-with-Large-Print-Set-4-Black-Orange/16884792

Source: https://www.amazon.com

Source: www.maxiaids.com

Source: https://www.lego.com/en-in/aboutus/news/2020/august/lego-braille-bricks/

Source: https://www.womansworld.com/gallery/food-recipes/best-adaptive-utensils-188832

Adapted Equipment Available for Purchase

DIY Adapted Equipment

All images sourced from Amazon.com

Referral to Specialty School

Considerations

1. Can the team currently adapt task/context so the student can access ECC?
2. In what ways is the home/sending district not meeting the educational needs of the student?
3. What is the goal of the referral?

Resources

- **Educational Resources**
  - Perkins School for the Blind
  - Texas School for the Blind and Visually Impaired
  - Paths to Literacy
  - American Printing House for the Blind
  - Braille and Talking Book Library
  - Teaching Visually Impaired
  - CVI Now - www.perkins.org/cvi-now

Resources

- **Assistive Devices**
  - Carroll Center for the Blind Store
  - Independent Living Aids
- **Books**
  - Cortical Vision Impairment: An Approach to Assessment and Intervention, 2nd Edition
  - Getting Ready for Braille! Hands-On Activities Based on a Developmental Sequence
  - Vision and the Brain, Dutton & Lueck

Future Research

- Literature on children with VI is limited
  - Largely focused on older adults & productive aging
- Research is needed to inform best practice in school-aged youth with VI:
  - Efficacy of OT intervention
  - Standardized assessments
  - Efficacy of intervention across all school-based settings

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Thank you!

See Handout for Works Cited

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