

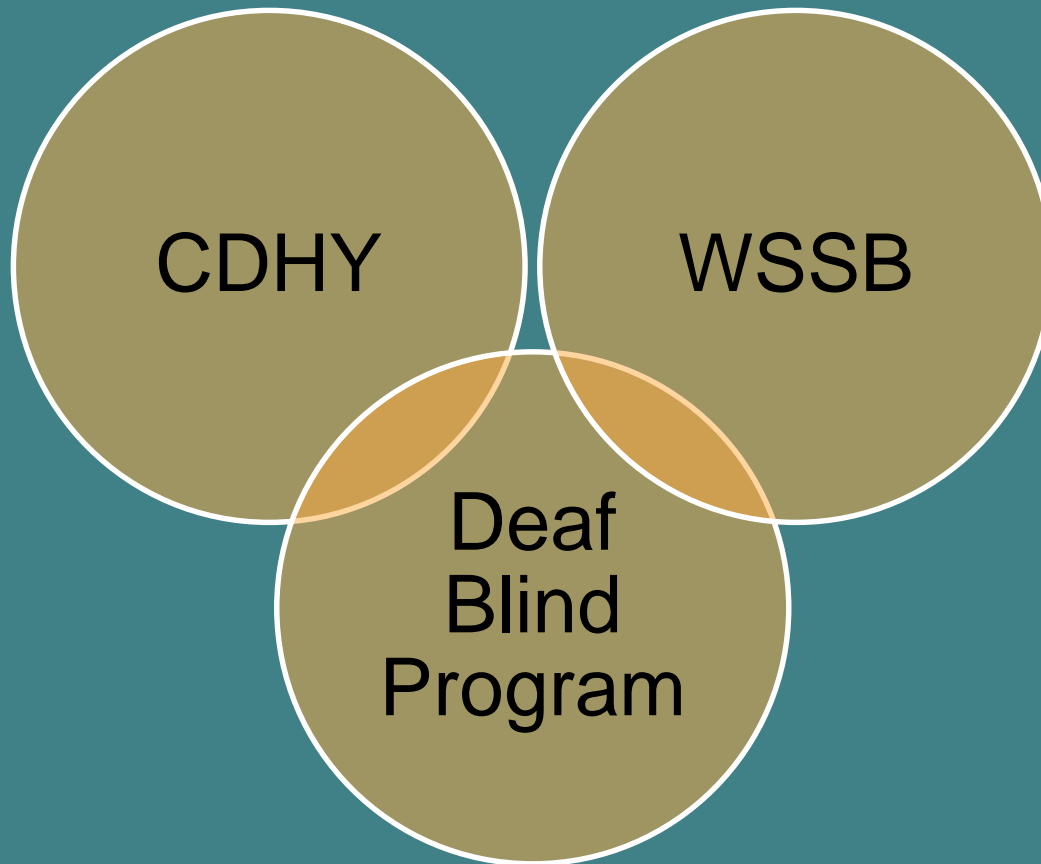
CVI Schedule:

Supporting the young child with cortical visual impairment with a routines based approach

DeEtte Snyder and Emma Packard



Washington Sensory Disabilities Services (WSDS)



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WSDS website:
<https://www.wsdsonline.org/>

Meet your presenters....

DeEtte Snyder, PhD

Associate Director of Outreach, Birth to 5
Statewide Coordinator of Birth to 3 Services
Washington State School for the Blind (WSSB)

DeEtte.Snyder@wssb.wa.gov

Emma Packard, M.A./M.Ed

Teacher of Students with Visual Impairment
DeafBlind Consultant
Washington Sensory Disabilities Services (WSDS)

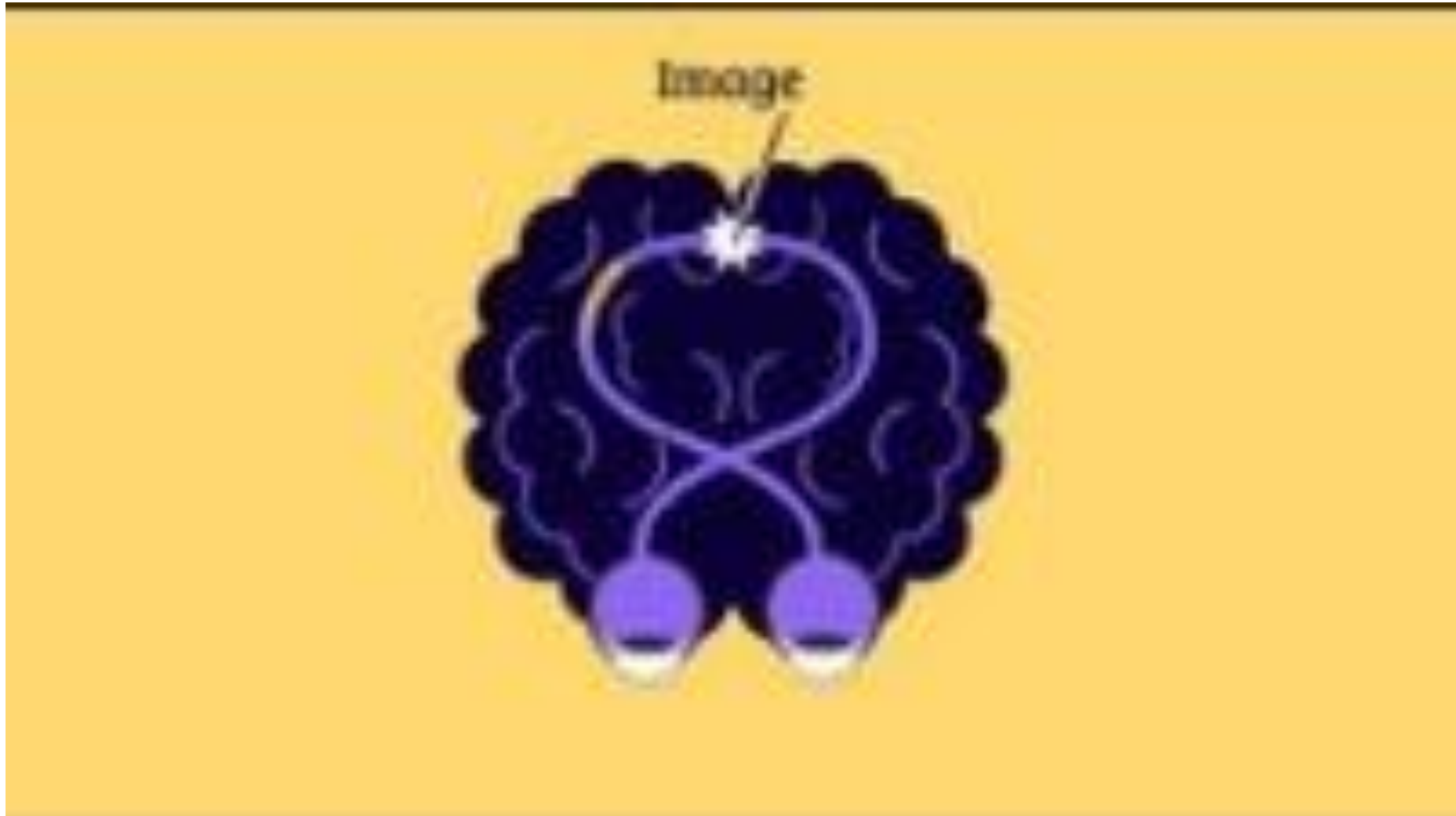
ebp Packard@msn.com

Today's Learning Objectives:

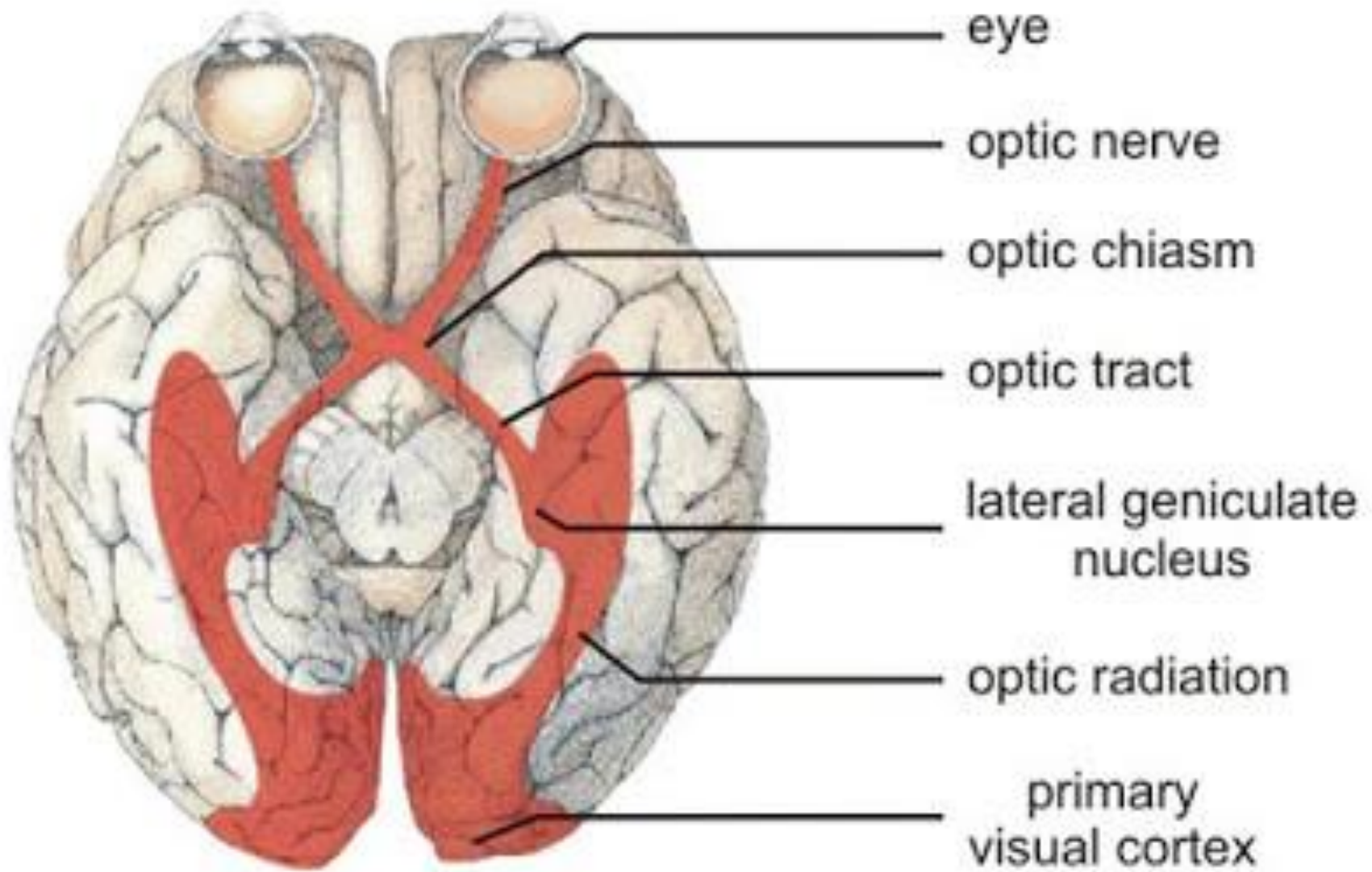
Participants will:

1. Identify 3 leading causes or risk factors of cortical visual impairment
2. Describe the role of vision on early learning and the potential impact on other developmental domains
3. Describe the potential improvements of overall visual functioning given visual support through daily routines
4. Utilize a CVI schedule in collaboration with a child's family and TVI to provide environmental accommodations for visual access in learning during routine daily activities

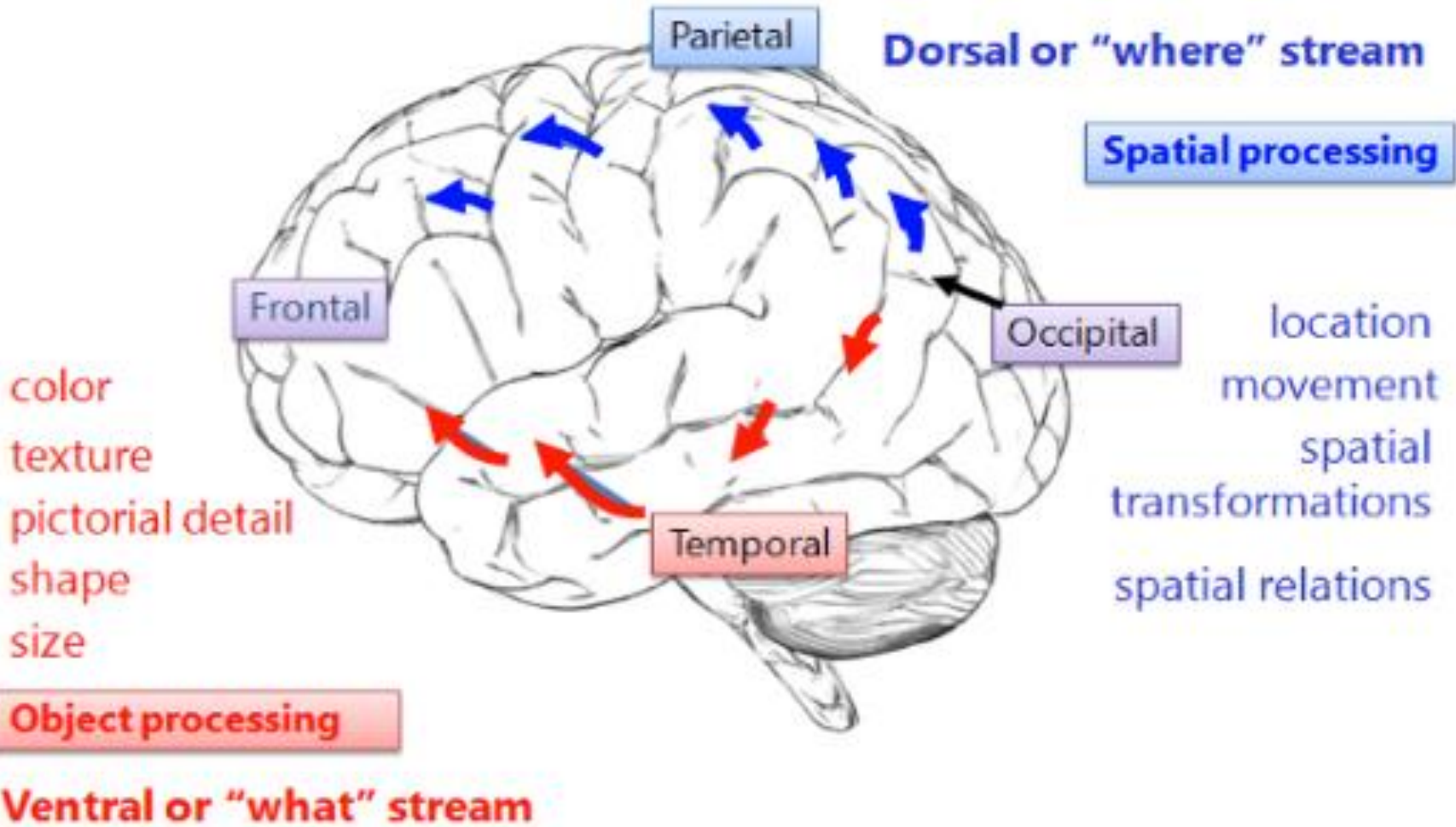
The Visual System



Visual Pathways in the Brain



Dorsal and Ventral Visual Streams



Visual Development

Occurs before birth and continues over first few years of life:

- Awareness
- Attention
- Location
- Recognition
- Understanding
- Generalization of visual skills

Critical Period – 1st year

Visual Skills involve:

- Acuity
- Visual fields
- Higher order visual processing
- Visual motor coordination

Vision, cognition, and motor development are all related and dependent on each other. They do not develop in isolation.

Top 3 Causes of BLV in Children

#1 Cortical Visual Impairment (CVI)

#2 Optic Nerve Hypoplasia (ONH)

#3 Retinopathy of Prematurity (ROP)

(Snyder, Rife, & Lyle, 2021; Babies Count: National Registry of Infants and Toddlers with Blindness or Visual Impairments)



What is CVI?

- Visual development that does not progress as expected due to damage or injury to, or differently structured, brain and visual pathway
- Typically normal ocular health
- Cortical Visual Impairment OR Cerebral Visual Impairment OR Neurological Visual Impairment
- Visual ability depends on type/severity, location, and age of onset (very individualized)

What causes CVI?

Pre-natal causes

- intrauterine infections
- brain development disorders

Peri-natal causes (premature babies), **#1**

- Hypoxia Ischemia Encephalopathy (HIE)
- Periventricular Leukomalacia (PVL)
- Intraventricular Hemorrhage (IVH)

Post-natal

- Head trauma, accidental and non-accidental, **#2**
- Cerebral nervous system infections
- Seizures

Neuroplasticity

Expect change!

Neural Plasticity – Development of neural pathways

1. Functional
2. Structural

Each child will have unique and individual potential for visual growth based on individualized brain structure.

Visual development can happen!

- delayed visual maturation of less damaged pathways
- neuroplasticity in brain's wiring

Visual Function Versus Functional Vision

Visual Function

- VEP- Visual Evoked Potential
 - PLT- Preferential Looking Test
- Conducted by ophthalmologist or neurologist but does not definitively diagnosis CVI

Functional Vision

- FVA – Functional Vision Assessment
 - LMA – Learning Media Assessment
- Conducted by teachers of the visually impaired (TVI) but does not diagnosis CVI

Together, doctors, teachers, and family can collect information for a diagnosis AND develop intervention strategies to assist with visual development.

The CVI Range (Roman-Lantzy, 2018)

0 1 2 3 4 5 6 7 8 9 10

Phase I

Phase II

Phase III

Building visual
behavior

Integrating vision
with function

Using vision for
most tasks.
Vision is still
dependent
on a variety
of external
factors.

The 10 Characteristics of CVI

- Color preference
- Need for movement
- Visual latency
- Visual field preferences
- Difficulty with complexity
 - Object
 - Array
 - Environment
 - Faces
- Need for light
- Difficulty with distance viewing
- Atypical visual reflexes
- Difficulty with visual novelty
- Absence of visually guided reach

Color



Color



Color

Word

Bubbling

Need for Movement



Need for Movement



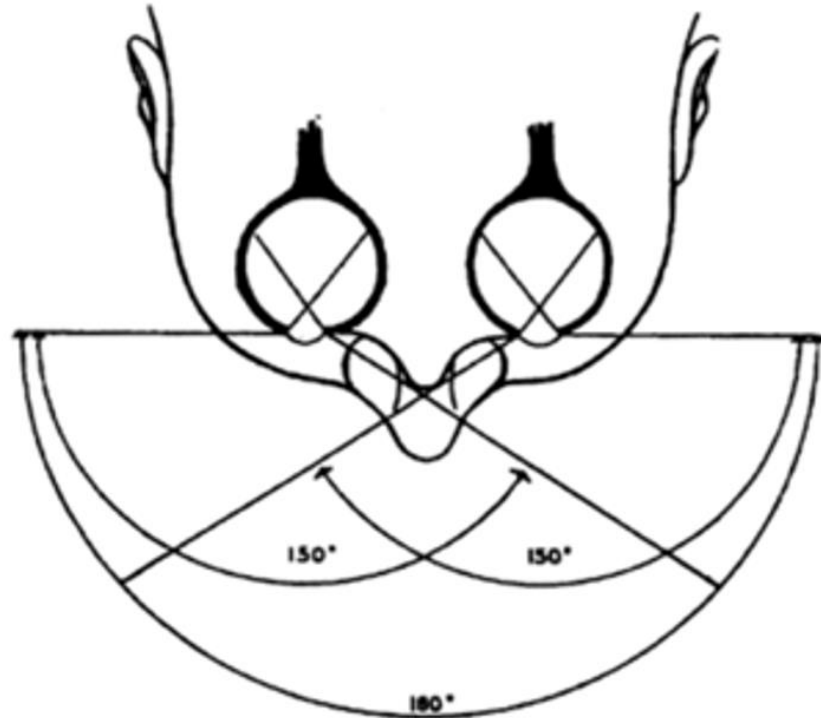
Visual Latency



Visual Field Preferences

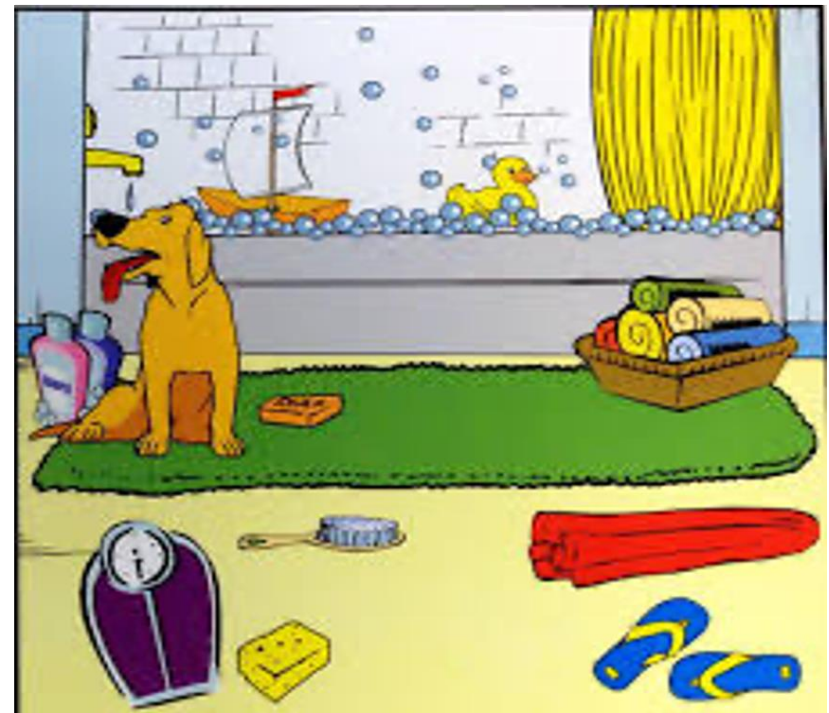
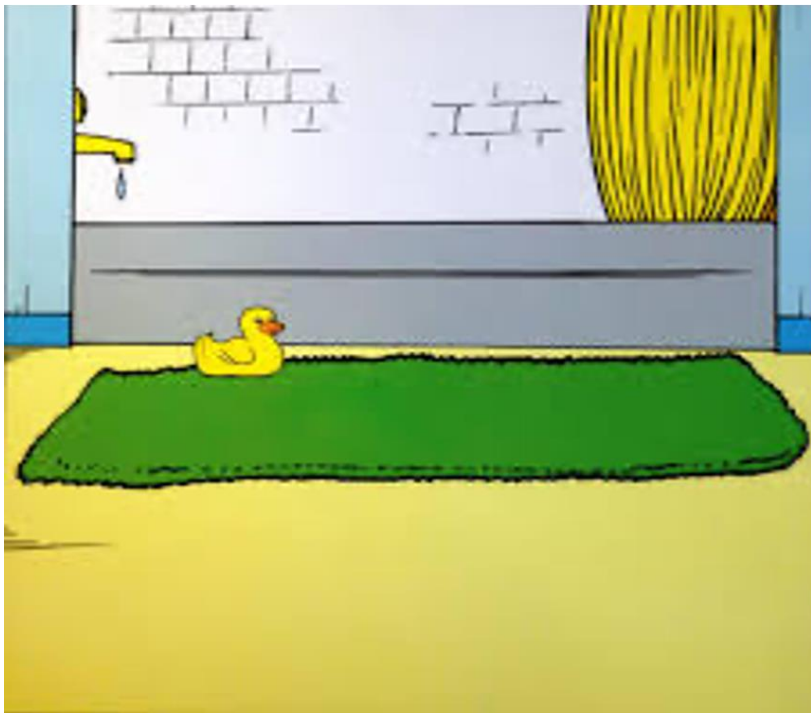


(a)



(b)

Difficulty with Complexity



Difficulty with Complexity



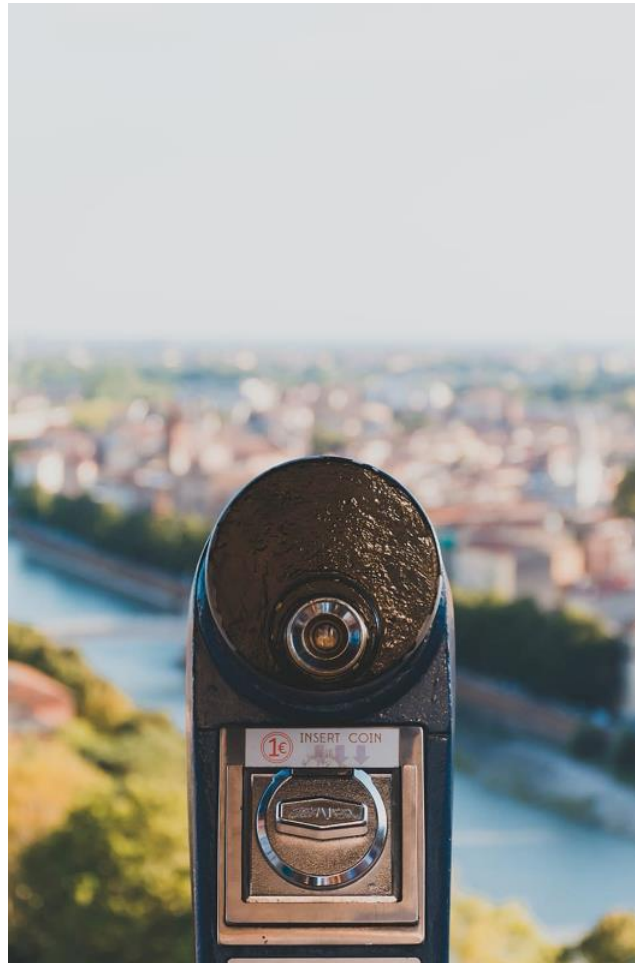
Need for Light



Need for Light



Difficulty with Distance Viewing



Atypical Visual Reflexes



Difficulty with Visual Novelty



Absence of Visually Guided Reach



Break

The CVI Schedule

- Routine-based early intervention (McWilliam, 2010)
- Information gathered by functional vision assessment (FVA) completed by TVI on the team
- Daily routines and activities designed with CVI adaptations to encourage the use of vision.

Vision happens all the time!!

The CVI Schedule

- Time of day
When will this happen
- Activity
What is happening- context
- CVI characteristic
What is the focus
- Adaption or modification
What is changed in the environment or our strategy

Case Study #1 – Infant/Toddler

Katie was born at 24 weeks gestation and weighed 1 lb 8 oz. She spent 4 months in the NICU before coming home. Very complicated NICU stay including a Grade 3 IVH and PVL. Latest MRI showed no cerebellum, which lead to a diagnosis of ataxic CP. Services by a TVI began at 6 months old and is now 18 months old. Her visual development was measured by the CVI Range where she initially scored a “3” (Phase 1) to a “5” (Phase 2) in 1 year.

Time	Activity	CVI Characteristic	Adaptations or modification
Morning	Breakfast	<ul style="list-style-type: none"> • Color • Novelty • Latency • Visual Fields • Visual Motor 	<ul style="list-style-type: none"> • Red • Areas on tray • High contrast • Support seating • Other senses (smell, taste, noise of cooking) • Time to coordinate visual motor • Consistency of routine (steps)



Time	Activity	CVI Characteristic	CVI Adaptations
Midday	Play	<ul style="list-style-type: none"> • Color • Movement • Complexity • Novelty • Visual Motor 	<ul style="list-style-type: none"> • Red and shiny • Solid black background • Toy bar • Support seating or side lying • To basket of toys

Blackboard with 1 toy on elastic string in side lying.



One toy on toy bar with black background in supported seating.



Time	Activity	CVI Characteristic	CVI Adaptations
Evening	Bathtime	<ul style="list-style-type: none"> • Color • Latency • Complexity • Visual Motor 	<ul style="list-style-type: none"> • Red washcloth • Red cup • Red contact paper over bottles • Supportive bath chair



Seat helps support unsteady sitters

Case Study #2 : Preschool

Kyle was born at 36-weeks gestation after a typical pregnancy. Kyle experienced non-accidental trauma at 4 months of age that resulted in vision impairment, low muscle tone, global developmental delay, epilepsy and intracranial hemorrhage. At 18 months of age, he was diagnosed with a mild hearing level in the left ear and a moderate hearing level in the right ear.

Kyle is 4-years-old. He receives services in a developmental preschool program. His vision is assessed to be 5-6 (phase II) on the CVI Range.

Case Study #2 : Preschool

- Color Preference: yellow; objects with up to 3 colors
- Need for Movement: initiates visual attention
- Visual latency: varies
- Visual field preferences: left peripheral field; starting to use central visual fields
- Difficulty with complexity: glances at familiar faces; tolerates low levels of noise

Case Study #2 : Preschool

- Need for light: no light-gazing; light supports viewing
- Difficulty with distance viewing: can view up to 6'
- Atypical visual reflexes: intermittent
- Difficulty with visual novelty: new objects must share attributes of familiar objects
- Absence of visually guided reach: inconsistent

Time	Activity	CVI Characteristic	CVI Adaptations
8:45-8:50	Transition from bus	<ul style="list-style-type: none"> • Color • Movement • Distance viewing • Complexity • Need for Light 	<ul style="list-style-type: none"> • Highlight landmarks • Alter time of transition • Consistent route • Use mini routes • Map on tablet

Time	Activity	CVI Characteristic	CVI Adaptations
9:00-9:20	Circle Time	<ul style="list-style-type: none"> • Color • Complexity • Novelty • Latency • Visual Fields 	<ul style="list-style-type: none"> • Highlight with yellow • Simplify visual information • Use familiar objects and visual information • Allow wait time • Position to use best visual fields

Time	Activity	CVI Characteristic	CVI Adaptations
9:30-9:50	Art	<ul style="list-style-type: none"> • Color • Complexity • Movement • Visual Fields 	<ul style="list-style-type: none"> • Limit colors • Limit visual and auditory clutter • Consider student and material position

Resources for more exploration of CVI

Hall Lueck, A. & Dutton, G.N., Eds. (2015). *Vision and the brain: Understanding cerebral visual impairment in children*. AFB Press.

McComiskey, A. (2021). *Babies with CVI: Nurturing visual abilities and development in early childhood*. APH Press.

Roman-Lantzy, C. (2018). *Cortical visual impairment: An approach to assessment and intervention*. 2nd Ed. AFB Press.

Roman-Lantzy, C., Ed. (2019). *Cortical visual impairment: Advanced Principles*. AFB Press.

Resources for more exploration of CVI

CVI Hub For Educators at Perkins School for the Blind

www.CVINow.org

www.Perkinselearning.org/cvi

Word Bubbling

<https://roman-word-bubbling.appspot.com/>

DIY from Diane Sheline

www.strategytosee.com

Little Bear Sees

www.littlebearses.org

Amazon - Little Bear Sees:

How Children with Cortical

Visual Impairment Can

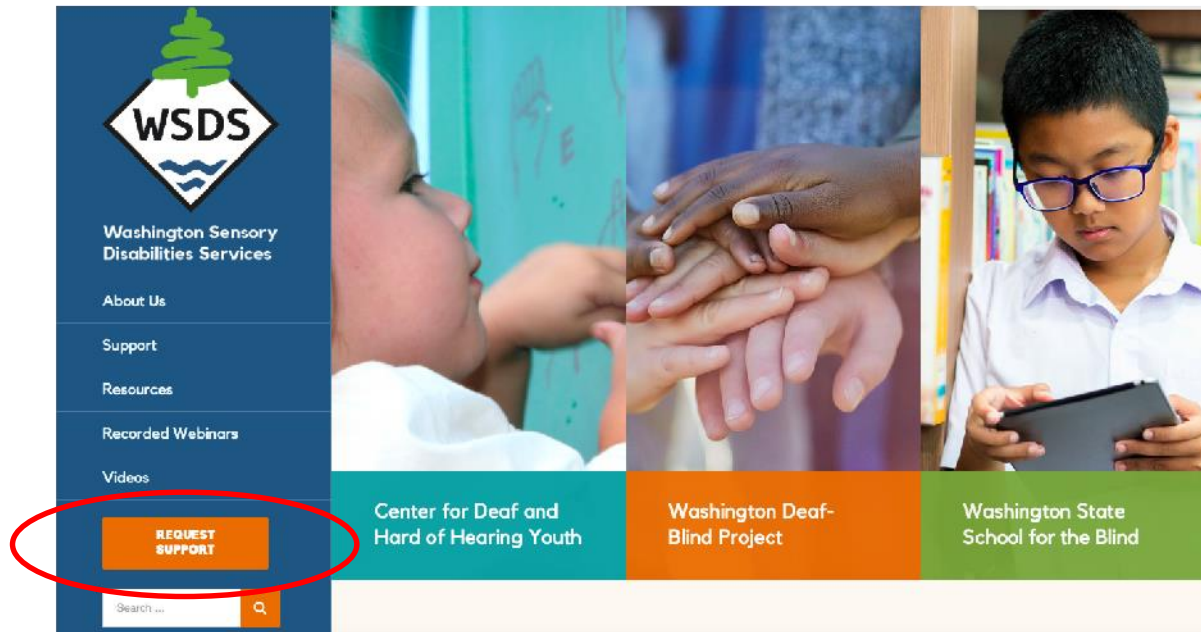
Learn to See: Tallent,

Aubri, Tallent, Andrei,

Bush, Fredy:

9781936214822: Books

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