Course Title:

**A B Sees: Vision Therapy for Kids aged 0-5**

Speakers:

**Jennifer Simonson, OD, FCOVD**

**Caitlyn Wong, OD**

**Boulder Valley Vision Therapy**

**2800 Valmont Road**

**Boulder, CO 80301**

[Www.bouldervt.com](http://www.bouldervt.com/)

**1+ (USA) 303-443-2257**

Bouldervt@yahoo.com

**A-B-Sees Course Summary**

Guiding visual development with optometric vision therapy is an important tool for treating young children. The preschool age group often presents with amblyopia and strabismus, conditions which greatly impact visual performance and motor coordination. This course covers vision therapy techniques designed to decrease suppression, improve oculomotor skills, develop accurate accommodation, and improve eye alignment and sensory fusion. Learn how to modify therapy techniques for young children and how to successfully sequence vision therapy based on age and ability.

 Learning Objectives:

1. Gain insight on how to guide visual development with optometric vision therapy for treating visual delays in young children.
2. Develop treatment plans focused on the preschool age group, which often presents with amblyopia and strabismus, conditions which greatly impact visual performance and motor coordination.
3. Train on vision therapy techniques designed to decrease suppression, improve oculomotor skills, develop accurate accommodation, and improve eye alignment and sensory fusion.
4. Learn how to modify therapy techniques for young children and how to successfully sequence vision therapy based on age and ability.
5. Learn about age-appropriate vision therapy procedures for preschool-aged patients.
6. Learn about vision training strategies for amblyopia to:
* Decrease suppression
* Improve fixation stability
* Improve accuracy of accommodation
* Develop depth perception
* Improve acuity

7. Learn about vision training strategies for treating strabismus to:

* Improve mobility of the turned eye
* Develop central fixation
* Build sensory fusion
* Build motor fusion (alignment and vergence)
* Appreciate stereopsis

Course Outline:

1. Vision in Preschoolers Research Study: VIP
	1. Early detection increases the likelihood of effective treatment
	2. Fewer than 15% of all preschool children receive an eye examination.
	3. Fewer than 22% of preschool children receive some type of vision screening.
	4. Prevalence of Vision Disorders
		* 1. Amblyopia (2-5%)
			2. Strabismus (3-4%)
			3. Significant refractive error (10-15%)
2. Five key vision training areas:
	1. Fixate
		1. Fixation requires visual attention
		2. Accurate gaze
	2. Follow
		1. Follow requires pursuit eye movements matching the speed and direction of target movement
		2. Coordinating head movement
		3. Maintaining body position.
	3. Focus
		1. Focus requires accurate accommodation to gain clarity at all distances.
		2. Viewing distance
		3. Harmon’s distance
	4. Fuse
		1. Motor alignment of the eyes to point in the same place
		2. Sensory perception to see in depth.
	5. Figure-out
		1. Figure-out is the integration of vision with all of the sensory and motor systems of the body.
		2. It is the processing of visual information to allow for identification, interaction and perceptual learning.
3. Normal visual Development
	1. Graphic Milestones
		1. Scribbles 15 months
		2. Imitates vertical stroke 2 years
		3. Imitates a circle 2 years
		4. Imitates a cross 3 years
		5. Copies a circle 3 years
		6. Copies a cross 4 years
		7. Copies a square 4.5 years
		8. Imitates oblique lines 4 yr., 9 mo.
		9. Copies a triangle 5 years
		10. Copies 2 pictures 5.5 years
		11. Copies oblique lines 5 yr., 9 mo.
		12. Copies divided rectangle 6 years
	2. Visual Thinking Hierarchy
		1. Age 1-2 Same – different
		2. Age 2-3 Direct matching
		3. Age 3-4 Side-by-side matching
		4. Age 5-6 Recall
		5. Age 7-8 More difficult patterns (parquetry)
		6. Age 9-10 Transpose (flip & rotate)
		7. Age 11-12 Tilted figures
		8. Age 13-14 Adult level skills
	3. Drawing
		1. Draw a Person
	4. Development of Stereopsis
	5. Near Point of Convergence
4. Signs of developmental lags in Vision Development

	1. Motor LEADS Vision Development
		1. From Birth until Six Months – motor development drives visual development
			1. A child at one month can follow moving lights
			2. Accidental touch of objects leads to visual reach at 3 months
			3. A four month old can focus as an object is moved as close as 16 inches
	2. The Emergence of Vision
		1. Object Permanence develops between 9-12 months.
			1. The child will search for a covered object because they know that it still exists.
			2. First concept that an object isn’t gone if it isn’t seen.
	3. Age 3
		1. Normal Visual Development
			1. Able to switch attention from near to far
			2. Shows good spatial orientation
			3. Able to scan smoothly
			4. Can team the two eyes at near and intermediate distances (up to 7-10 feet)
			5. Ability to plan ahead and predict movements in space (better able to catch a ball)
			6. Able to name more objects seen
			7. Able to describe experience of space – over, under, back, bigger, more
			8. Able to turn eyes without moving head
		2. Signs of Developmental Lags (25% below Average)
			1. Oculomotor
				1. Unable to follow a moving object without moving the head
				2. Has to move the head to shift attention
				3. Unable to walk and observe at the same time – has to be still to look
			2. Coordination
				1. Unable to complete a three-piece form board
				2. Cannot draw a circle
				3. Unable to fold paper
			3. Space Perception
				1. Few spatial words (does not use over, from, by, on top of)
				2. Unable to place an object as directed
				3. Cannot specify space details: kitchen vs. “house”
	4. Age 4
		1. Normal Development
			1. Able to make eye contact at 10 to 16 feet
			2. Able to make recognizable drawings
			3. The child can begin to visualize and look ahead to plan motor activities
			4. More peripherally aware
			5. Imaginative play
			6. Able to combine horizontal and vertical movements
		2. Signs of Developmental Lags (25% below Average)
			1. Can only watch an object as close as 5 inches
			2. Eyes move in large jumps to follow an object
			3. Loses track of target if keeps head still
			4. Eye-Hand Coordination

Unable to do tasks without watching hands

Unable to build a bridge with blocks

* + - 1. Space Perception

Unable to follow directions such as “place the toy (on, in, behind, in front, beside)”

Unable to fit shapes together to make a design

Unable to copy a sequence of four

* 1. Age 5
		1. Normal development
			1. Acuity has now developed to see clearly at 20 feet
			2. Able to maintain eye contact
			3. Can draw circle, cross and edges
			4. Can accurately judge where things are in space
			5. Can identify objects by color, size and position
			6. Improved tracking skills (fully developed at age 7)
			7. Improved binocularity (able to fill a cup without spilling)
	2. Signs of Developmental Lags (25% below Average)
		+ 1. Can only watch an object to 3 inches
			2. Eyes move in small stops and starts
			3. Eyes overshoot or undershoot the target
			4. Signs of Developmental Lags
			(25% below Average)
			5. Eye-Hand Coordination

Square looks like a capital D

Unable to copy a triangle

Unable to complete a form board

* + - 1. Space Perception

Unable to put two triangles together to make a rectangle

Does not know his left or right side

Cannot follow directions when drawing to place a mark under, above, behind, or in front of a printed shape.

1. Adapting Vision training activities for Young (or developmentally delayed) patients
	1. Visual Target Types
		1. Start with real objects
			* 1. Manipulatives

Blocks

Finger puppets

* + 1. Use pictures of real objects
			- 1. Toys
				2. Photos
		2. Use drawings of real objects
		3. Use symbols that are common and easily recognized
			1. flower
			2. apple
		4. Object-Picture-Symbol-Word Matching
	1. Complete activities with movement – rolling, crawling, standing, walking, jumping
	2. Create situations that the child would naturally perform the desired task. For example, to place the eye in up gaze use a balloon, bubbles, or a ball suspended from the ceiling.
	3. Incorporate the child’s interests – matchbox cars, Duplo blocks, kittens, trains
	4. Participate in the activity – wear the red/green glasses too
		1. Clinical Pearls from Linda Sanet, COVT
			1. Rule 1. Know and understand your patient.
			2. Rule 2. Children are not little adults.
			3. Rule 3. Understand the visual process.
			4. Rule 4. Be flexible.
			5. Rule 5. Be creative.
	5. Vision Therapy approach
		1. Sequencing Vision training
			1. Phase 1: Optimal lens prescription (may include prism or bi-nasal occlusion)
			2. Phase 2: Motor skills development
			3. Phase 3: Equalizing Monocular Skills
			4. Phase 4: Fusion development using Monocular Fixation in a Binocular Field
			5. Phase 5: Bi-ocular training to reduce sensory suppression
			6. Phase 6: Binocular training to extend fusional ranges
			7. Phase 7: Integration of sensory and motor systems
			8. Phase 8: Visual processing speed and efficiency
1. Visually-Guided Movement
	1. Gross motor (walk, run, jump, climb)
		1. Angels in the Snow
	2. Balance Board
		1. Unstable surface: Trampoline walks
		2. Trampoline jumps
	3. Body Lifts Balance Sequence
	4. Body Awareness
	5. Ball Rolling
	6. Balloon Volleyball
	7. Tossing
	8. Bubble Activities
	9. Randolph Shuffle
		1. **ARM MOVEMENT**: From the STARTING POSITION the arm is raised to shoulder level, hand pointing straight ahead. Patient calls out “FRONT.” Arm moves so it is extended straight out from the shoulder. Patient calls out “SIDE.” The arm returns to Front, patient calls out “FRONT. “Arm returns to STARTING POSITION. Patient calls out “BACK.”
		2. **LEG MOVEMENT:** From the STARTING POSITION, the foot is lifted and moved straight out in front of them, pointing the toe and placing it on the ground. The weight of the body is NOT shifted to this foot, it is a toe tap. Patient calls out “FRONT.” Foot is lifted and moved out to the side, even with the other foot. Patient calls out “SIDE.” Patient returns to front. Patient calls out “FRONT.” Foot returns to STARTING POSITION. Patient calls out “BACK.”

THE FOLLOWING SEQUENCE IS PRACTICED, USING THE MOVEMENTS DESCRIBED:

* + - 1. right arm
			2. left arm
			3. right foot
			4. left foot
			5. both arms
			6. right arm – right foot
			7. left arm – left foot
			8. right arm – left foot
			9. left arm – right foot
			10. both arms – right foot
			11. both arms – left foot
1. Visually guided fine motor activities
	1. Hands, fingers
		1. Coloring
		2. Lacing
		3. Stringing
		4. Grasping
		5. Inserting

Slot orientation

* 1. Spearing

Cheerios on Pointer

* 1. Drawing
		1. Template Tracing
		2. Stencil tracing
		3. Chalkboard circles
		4. Mazes
		5. Tunnels and Sidewalks
		6. Follow the path (Groffman)
		7. Picture tracking
		8. Symbol tracking
		9. Circle hidden pictures
		10. Dot-to-dots
		11. Line scrubbing: Scribble the line out by coloring perpendicular to the line with equal space above and below the line
		12. Letter tracing
		13. Letter writing
		14. Line Tracing
		15. Groffman tracing
		16. Symmetry
		17. White board drawing
	2. Stacking
	3. Building
	4. Tracing
1. Fixate and Follow: Tracking activities
	1. Oculomotor Skills
	2. Optokinetic Nystagmus Apps/Drum
	3. Flashlight activities
		1. Flashlight tracking
		2. Flashlight tag
	4. Red Light in Red Ring
	5. Marble activities
		1. Pie Tin Rotations
		2. Marble Catch
		3. Marble Trap
		4. Marble balance on golf tees
	6. iPad tracking games: Tap-n-see Bear
	7. Tracking targets
		1. Stickers
		2. Finger Puppets
		3. Marsden Ball
		4. Shape Touch
		5. Eyes on Track
		6. Eye stretches
		7. Four Corner Fixations
		8. Picture chart reading
2. Focusing: Accommodation activities
	1. Near-Far Look and Match activities
		1. Near-Far drawing and coloring
		2. Near-Far parquetry
	2. Lens activities
		1. Pull-aways
3. Fusion: Binocularity training
	1. Monocular Performance
		1. Opaque occlusion (no light)
		2. Translucent occlusion (light without form)
		3. Monocular Performance
		4. Filter occlusion: selectively block one color
		5. Septum occlusion: block target from one eye
		6. Prism Training
	2. Monocular Performance under Binocular Conditions (MFBF)
		1. Monocular Fixation/Binocular Field
		2. Red Lens/Green Lenses worn by patient, red image on white paper
			1. MFBF: only 1 eye sees detail: Cancel information with a Red Patch over better eye or Red Green glasses.
				1. Image turns black with green filter and red with white paper/red ink
				2. Cancel information with a Red Patch over better eye or Red Green glasses.
				3. The eye not covered by the red patch or the eye behind the green lens can see the detail.
		3. Other examples of MFBF
			1. TV Trainer
			2. Lite-Brite (sort pegs)
		4. MFBF Cards
			1. Pink and Red coloring books
			2. Green ink
			3. Red Cards with Black Ink and White Cards with Red Ink (sort)
				1. Sherman Cards
				2. Perceptive Cards
				3. Carl’s Cards
				4. MFBF Game (Red Red Rock)
				5. Franzblau Cards
			4. White ink on red background/White ink on green background
				1. Fish Cards (Red/Green Toybox)
			5. Red/Green Dry Erase Markers
			6. Preschool Activities with Red/Green
				1. Magnetic Town
	3. Biocular Training
		1. Goal: to improve the ability of both eyes to alternately shift focus in **an un-fused situation**, this will facilitate anti-suppression and prepare the patient for simultaneous perception.
		2. Biocular Training
			1. Dissociating Prism
			2. Vectographic Slides separated
			3. Anaglyphic Slides separated
		3. MFBF Matching Game
	4. Anti-Suppression Training
		1. Press Lites
		2. Red and Green Flashlights
		3. TV Trainer and Red/Green Filters
		4. Picture search with red/green filters
		5. Black Felt Activities
		6. Red/Green Activities
			1. Whiteboard + Red & Green markers
	5. Binocular Training
		1. Brock String
		2. Yardstick and Pins (rigid Brock String)
		3. Convergence Training
		4. Spoon and Ping Pong Ball
		5. Straw: Inhale
		6. Straw: Exhale
		7. Convergence Training
		8. Vectograms
		9. Vectographs
		10. Phantograms
		11. 3-D Photo Books
		12. Anaglyphs
			* 1. Red/Green
				2. Red/Cyan
				3. Red/Blue
			1. Variable Tranaglyph (red/green)
			2. Fixed Images
		13. Computer Vergences
		14. Mirror Superimposition/Overlap
		15. Cheiroscopic Tracing: Preschool modifications (squash the bug, color the spots)
		16. Prism Training
		17. Bernell-o-scope: Preschool modifications (real objects in space)
		18. Fusion Cards
4. Figure-Out: Visual perception and processing
	1. Object-Picture match
	2. Discrimination: Sorting Concepts
		1. Attributes
			1. Shape
			2. Color
			3. Thickness
			4. Size
			5. Object
		2. Multiple features: Shape (square) and Color (yellow)
	3. Items for sorting
	4. Attribute Sorting
		1. Matrix Cubes
		2. Parquetry Blocks
		3. Match the Patterns
		4. Beads
		5. Manipulatives
	5. Pegboard
	6. Rotating Peg Board
	7. Shape Sorters
	8. Form Board Puzzles
	9. I-Spy
	10. Figure-Ground Hidden Pictures
	11. Sort by Color or Shape Games
	12. Visual-Tactile
5. Improving patient compliance
	1. Provide a written prescription
	2. Present reading material on the diagnosis
	3. Be available for questions: communicate if a phone call, e-mail, or appointment is needed
	4. Track progress with logs and reports
	5. Progress Graph
	6. Schedule follow-up evaluations
6. Website resource list
7. References
8. *Accommodative and Vergence Dysfunction*. Cooper, J. S., Burns, C., Cotter, S. A., Daum, K., Griffin, J. R., & Scheiman, M. M. (1998, March). Retrieved from <http://www.aoa.org/documents/CPG-18.pdf>
9. “Advanced Amblyopia Treatment for Better Results” – 2015 COVD Annual Meeting presented by Dan Fortenbacker, OD, FCOVD
10. “*Amblyopia and Binocular Vision” by* Birch, Eileen E.Prog Retin Eye Res. 2013 March; 33: 67-84. Doi:10.1016/j.preteyeres.2012.11.001
11. Anomalies of Binocular Vision: Diagnosis & Management by Rutstein and Daum OD, MS, 1998
12. Applied Concepts in Vision Therapy*.* Press, L. J. (1997). Mosby: 978-0815167297.
13. “Findings from the Vision in Preschoolers (VIP) Study” Optom Vis Sci. 2009 Jun: 86(6): 619-623. [Https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2806243/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2806243/)
14. *Manual of Esotropia Therapy*. By Bateman, R., Danner, R., Dowis, R., et al. (1985). Colorado Vision Consultants: Colorado.
15. Manual of the Wach’s Analysis of Cognitive Structures Test, OEPF
16. “MFBF Matching Game Product Instructions” by Marc Taub, OD, FCOVD. Good-lite: <https://www.good-lite.com/cw3/Assets/documents/MFBF_Matching_Game_Insructions_0822141.pdf>
17. Press lites – procedures for visual field awareness. Optom Vis Perf 2013; 1(2):62-7. [Http://www.oepf.org/sites/default/files/OVP1-2\_article\_Press\_web.pdf](http://www.oepf.org/sites/default/files/OVP1-2_article_Press_web.pdf)
18. *Principles and Practice of Vision Therapy* by Press, L. J. (2008) Optometric Extension Program: California.
19. “Testability of preschoolers on stereo tests used to screen vision disorders.” Schmidt PP, Maguire MG, Moore B, Cyert L, Vision in Preschoolers (VIP) Study Group. Optom Vis Sci. 2003 Nov: 88(11): 753-7. [Https://www.ncbi.nlm.nih.gov/pubmed/14627942](https://www.ncbi.nlm.nih.gov/pubmed/14627942)
20. “The History of the Treatment of Amblyopia.” By S.E. Loudon, H.J. Simonsz, Strabismus, 13:93, 2005.
21. *The Vision Therapist's Toolkit.* Headline, T. C., Wahlmeler, I., & Bedes, V. (2005). San Jose: California.
22. Thinking Goes to School by Furth and Wachs, OD, 1972
23. Understanding and Managing Vision Deficits: A Guide for Occupational Therapists, 2nd Ed. Mitchell Scheiman OD, FCOVD, FAAO. 2002
24. “Vision and Human Development in Infant and Child,” COVD Applied Concept Course, 2003
25. Vision Therapy for Young Children (Chapter 26, Simonson, JS). Visual Development, Diagnosis, and Treatment of the Pediatric Patient, 2nd ed. Wolters Kluwer, 2020: 516-555. ISBN: 9781975111441
26. Vision, it’s Development in Infant and Child by Arnold Gesell, MD, 1970
27. Your Child’s Vision: A parent’s Guide to Seeing, Growing, and Developing by Richard S. Kavner, OD, 1985