

# THE COMPLEX VISUAL PROCESS

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## FINANCIAL DISCLOSURE

- I have no financial relationships to disclose.

## COURSE OBJECTIVES

- To familiarize the attendee with the visual processing system, dysfunctions, and the interplay with the other sensory systems.
- To introduce potential screening tools and signs/symptoms that warrant a vision referral.

## ABOUT ME

- Grew up in Haysville, Kansas
- Graduated from the University of Kansas – 2004
- Graduated from Southern College of Optometry – 2009
- Completed Pediatrics/Vision Rehab Residency – 2010
- Married to another optometrist, Jonathan Reddell – 2010
- Moved to Leavenworth to join Family EyeCare Center; Started MVP: Movement Vision Performance – 2010



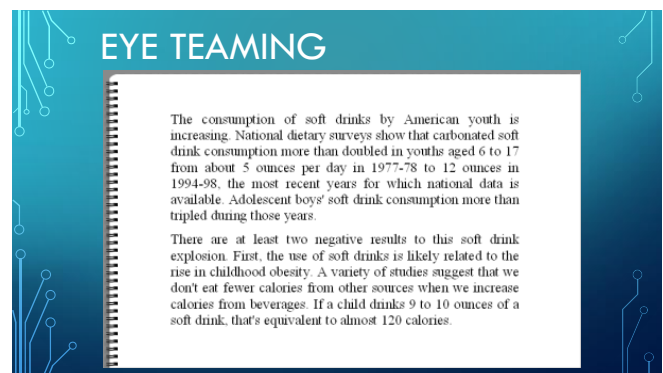
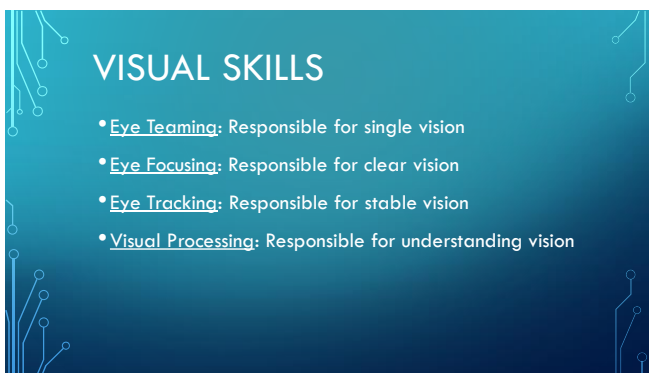
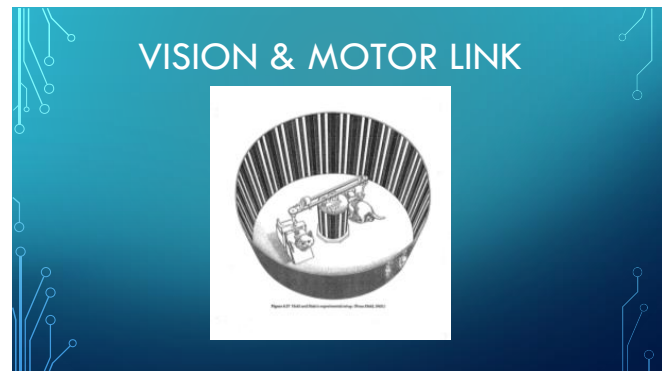
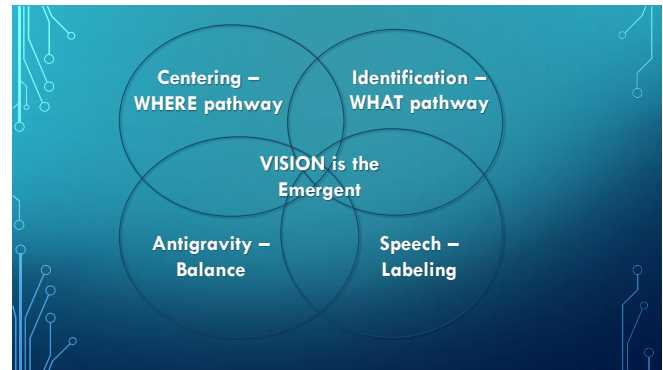
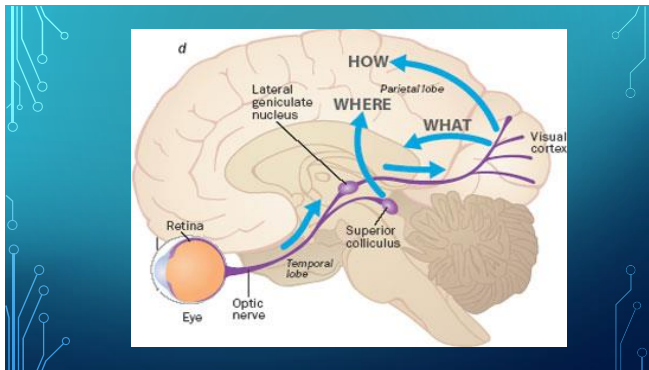
## SIGHT VS. VISION

- **SIGHT** is what allows us to read 20/20
  - Good Eye Health
  - Glasses Prescription
- **VISION** is what the **BRAIN** does with the information taken in from the eyes



## WHAT IS IT?

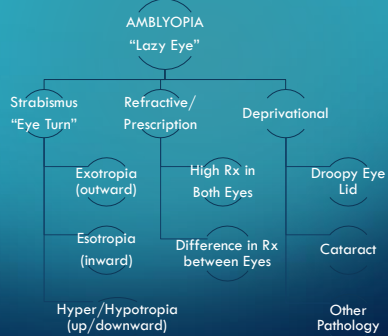




## EYE TEAMING - SYMPTOMS

- Sees double when reading or doing up close activities
- Words swim/move on the page
- Closes or covers one eye when reading
- May lean on table or hold head at angle
- Avoids prolonged close up activities
- Typically worse at the end of the day
- Watch for head turns/tilts/posture

## VISUAL DEVELOPMENT



## EYE FOCUSING

Failing to clean off your desk before lunch not only raises the risk of salad dressing spilling onto your work, but it could also increase your chances of getting sick. A new report shows that close to half of Americans don't clean their desks before eating at them, and a third don't wash their hands, which may foster the spread of infectious diseases like colds and flu.

Due to a shortage of the flu vaccine this year, health officials have urged the public to take measures to reduce their risk, and researchers say improving at-work hygiene and hand washing habits could have a major impact in reducing sick days. "Desks, phones, door knobs, conference tables, fax machines and other common workplace areas can be breeding grounds for bacteria-spreading germs," says Brian Sansoni, spokesman for the Soap and Detergent Association, in a news release.

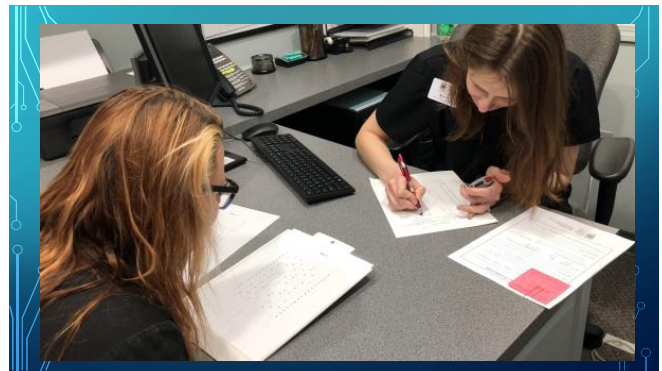
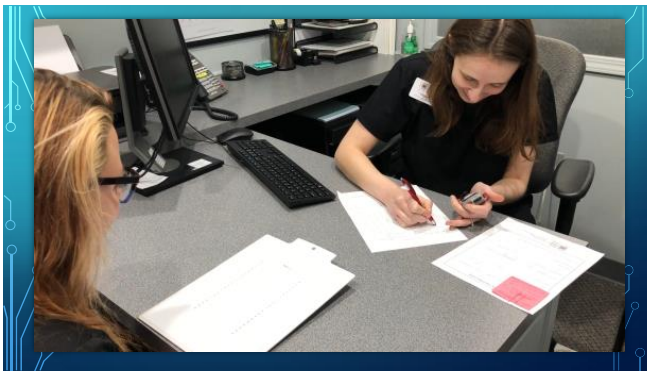
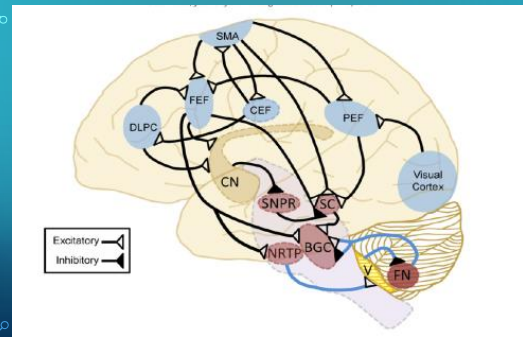
## EYE FOCUSING SYMPTOMS

- Reports intermittent blur when reading
  - Often 20/20 on vision screening
- Headaches while reading
- Must squint or blink when looking back and forth from desk to distance (forced blinking)
- Difficulty copying from the chalkboard

## EYE TRACKING

What if your eyes jumped around like this?

Henry looked to the right. He looked to the left. He looked up, and he looked down. Where had Frog gone? Henry did not like being alone in the forest. "Frog, where are you?" Henry called. "Please come back!"



Actualization Pre-Test % N      Number Knowledge Pre-Test % N

i - substitution error      o - omission error

a - addition error      c - transposition error

Test 4

	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	11
2	3	4	5	6	7	8	9	10	11	12
3	4	5	6	7	8	9	10	11	12	13
4	5	6	7	8	9	10	11	12	13	14
5	6	7	8	9	10	11	12	13	14	15
6	7	8	9	10	11	12	13	14	15	16
7	8	9	10	11	12	13	14	15	16	17
8	9	10	11	12	13	14	15	16	17	18
9	10	11	12	13	14	15	16	17	18	19
10	11	12	13	14	15	16	17	18	19	20

Time: \_\_\_\_\_

Substitution errors \_\_\_\_\_      Transposition errors \_\_\_\_\_

Deletion errors \_\_\_\_\_      Addition errors \_\_\_\_\_

Mistake Total = Time X (SE + AE)

\_\_\_\_\_

Tested Times \_\_\_\_\_      Adjusted Time \_\_\_\_\_

\_\_\_\_\_      \_\_\_\_\_

Tested Times = 2 + 4 = 6

\_\_\_\_\_

Dem Ratio \_\_\_\_\_

\_\_\_\_\_

7 year old scored in the 50<sup>th</sup> percentile on the “verbal language automaticity” portion.

Unable to score the horizontal tracking portion due to complete lack of ability.

## EYE TRACKING SYMPTOMS

- Loses place while reading
- Skips words or lines while reading
- Will often reverse words like was/saw, on/no because processing last part of word first
- Difficulty copying from the chalkboard
- Will often use their finger to follow along or require a ruler/straight edge



## CENTRAL VISUAL PROCESSING

- Perception of Space
- Visual Motor Integration
- Visual Memory
- Visualization
- Auditory-Visual Integration
- Central-Peripheral Processing
- Form Perception
- Laterality/Directionality
- Figure Ground

## PROCESSING SYMPTOMS

- Visual Spatial Orientation Deficiency
  - Delayed gross motor development & bilateral integration
  - Confusion of left & right, letter reversals, transpositions
  - Inconsistent dominant handedness & difficulty crossing midline
- Visual Analysis Skills Deficiency
  - Delayed letter identification
  - Poor sight vocabulary
  - Difficulty with math operations
  - Poor discrimination of similar looking objects or words



Press, Leonard. *Parallels between Auditory & Visual Processing*. California: Optometric Extension Program Foundation, 2012: 45, Table 4.

## PROCESSING SYMPTOMS

- Visual-Motor Skills Deficiency
  - Difficulty writing or copying
  - Poor spacing & organization of written work
  - Oral spelling better than written spelling
  - Postural skews or awkward pencil grip when writing
- Visual-Auditory/Visual-Verbal Integration Disorders
  - Difficulty with sound-symbol associations
  - Difficulty learning numbers or the alphabet
  - Reduced reading speed



Press, Leonard. *Parallels between Auditory & Visual Processing*. California: Optometric Extension Program Foundation, 2012: 45, Table 4.

## IN THE VISION REHAB ROOM

### Enhance Visual Skills with Improved Sensory Integration

- |                 |                                 |
|-----------------|---------------------------------|
| • Metronome     | • Cognitive skills              |
| • Gross Motor   | • Attention                     |
| • Fine Motor    | • Dual Tasking                  |
| • Vestibular    | • Central-Peripheral Processing |
| • Verbal skills | • Reflexes                      |

80% of what we learn  
is processed through the  
visual system!

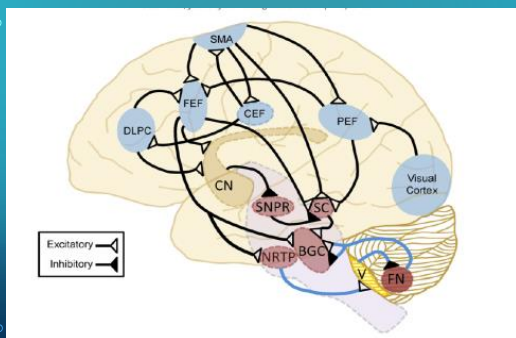
## GARBAGE IN → GARBAGE OUT

"If a child sees **distorted**  
he reproduces **distorted** and  
he therefore learns **distorted**."

-G.N. Getman, OD-

Any **developmental delay**  
is a signal that there could be  
a vision problem

PART OF THE  
CONCUSSION  
REHAB TEAM



## WHAT CAN YOU DO?

- Listen for symptoms we have discussed
  - "Vision & Learning Screener"
- Consider incorporating the Developmental Eye Movement Test "DEM"
- Refer any Developmental Delays for a Comprehensive Eye Exam
  - InfantSEE ([www.infantsee.org](http://www.infantsee.org))
  - See to Learn ([www.seetolearn.com](http://www.seetolearn.com))
  - Only 14% of children arrive at school having had a professional eye exam....ALL KINDERS SHOULD HAVE "REAL" EXAM!
- Consider referring Post-Concussional Syndrome to OD with specialty
- Visual Hygiene

## REFERRAL TIPS

- Tests for NEAR vision are key to diagnosis.
- Patient asks specifically if eye care practitioner tests these visual skills:
  - Eye Teaming
  - Eye Focusing
  - Eye Tracking
  - Visual Information Processing
- [www.covd.org](http://www.covd.org) → doctor locator

## VISUAL HYGIENE

- 20/20/20 Rule
  - Every 20 minutes take 20 seconds to look 20 feet away
- Lighting
  - Try to eliminate exterior lighting
  - Position computer so windows/lighting from the side...not in front or behind
  - If possible, turn off the overhead fluorescent lights and use floor lamps that provide indirect incandescent or halogen lighting instead.

## VISUAL HYGIENE

- Anti-Glare coatings for kids' glasses
- Seating Position
  - Feet should be flat on the floor
  - Seating options...exercise ball
- Blinking
- Outdoor time

QUESTIONS??

