

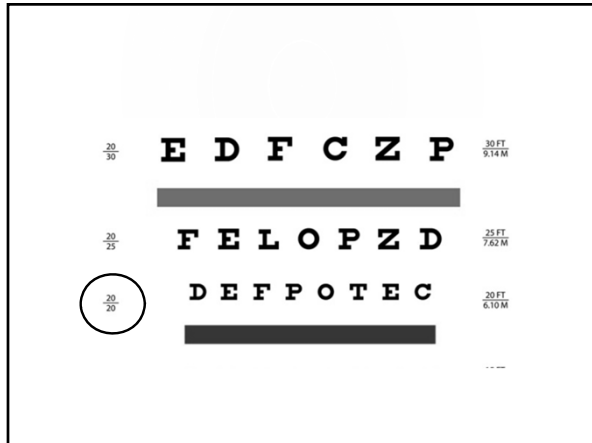
Neuro-Developmental Optometry: A Key Element in the Rehabilitation Team

NEURO-DEVELOPMENTAL OPTOMETRY: A KEY ELEMENT IN THE REHABILITATION TEAM

AMY PRUSZENSKI, OD, FCOVD
NEURO-DEVELOPMENTAL OPTOMETRIST

AMY PRUSZENSKI, OD, FCOVD

- 1989 Massachusetts Institute of Technology
Bachelor of Science degree in Cognitive Science
- 1993 New England College of Optometry
- 2012 Fellow College of Optometrist in Vision Development



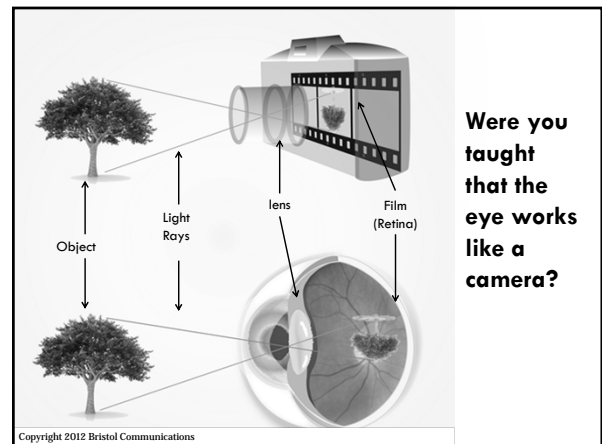
20/20

You are looking at the eye chart
from a distance of 20 feet

You can see the size of letter you
should see from 20 feet

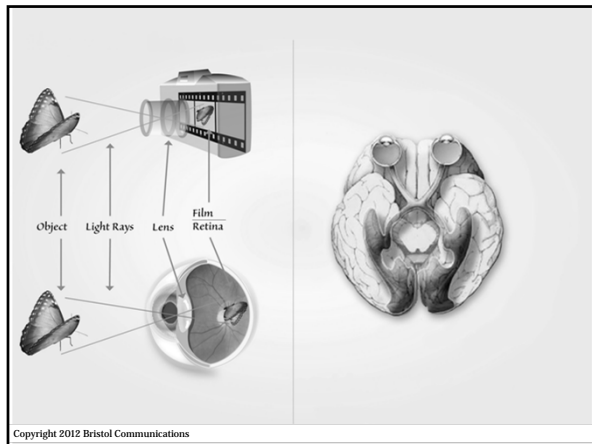
THE MYTH OF 20/20 VISION

Most vision problems
go undetected
because most people
think
20/20 = perfect vision



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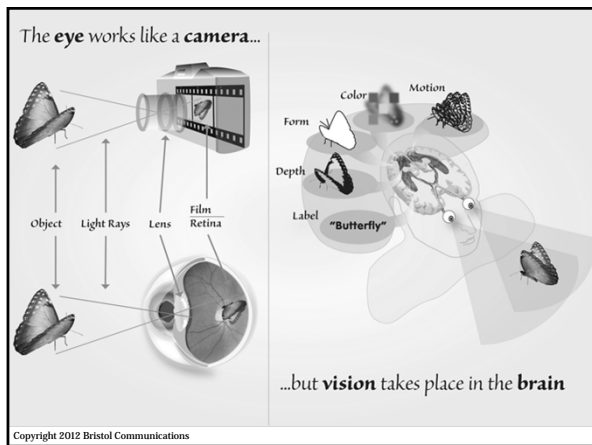


WHAT IS VISION?

“The global ability of the brain to extract, process and act on information presented to the retina.”

Steven J. Cool, Ph.D.

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DEFINITION OF VISION

Vision is ...

the deriving of meaning and directing of action, as triggered by light

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WHAT IS A VISION PROBLEM?

The inability to effectively:

- take in
- process
- integrate
- respond to what is seen

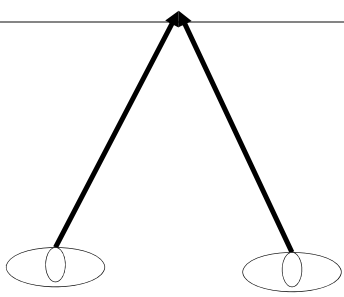
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Eyes Have to Point to the Same Place

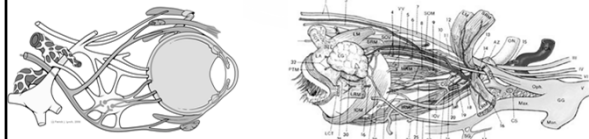


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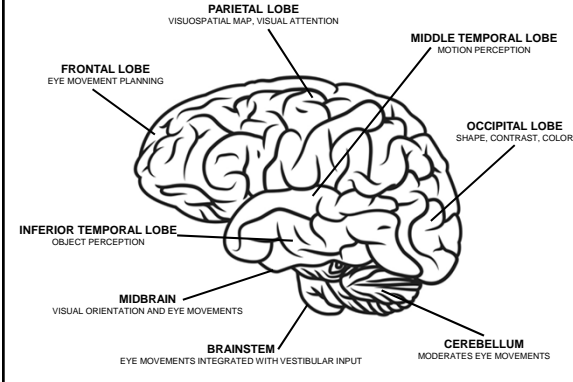
Once upon a time, there was a very ugly duckling. One day a beautiful princess came along and rescued him from a horrible fate. She picked him up into her hands and was ready to kiss him when....

WHY DO VISUAL DEFICITS OCCUR AFTER TBI?

- There are over 1,900,000 nerve fibers that exit each eye.
- This represents 70% of the sensory nerve fibers in the body.



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FRONTAL LOBE
EYE MOVEMENT PLANNING

PARIETAL LOBE
VISUOSPATIAL MAP, VISUAL ATTENTION

MIDDLE TEMPORAL LOBE
MOTION PERCEPTION

OCCIPITAL LOBE
SHAPE, CONTRAST, COLOR

INFERIOR TEMPORAL LOBE
OBJECT PERCEPTION

MIDBRAIN
VISUAL ORIENTATION AND EYE MOVEMENTS

BRAINSTEM
EYE MOVEMENTS INTEGRATED WITH VESTIBULAR INPUT

CEREBELLUM
MODERATES EYE MOVEMENTS

Optometric Rehabilitative Treatment Of TBI

- Nerves go directly from the vestibular system to the eyes and the vision system
- The vestibular and vision systems are intertwined with proprioception
- By working on both systems together we can initiate more rapid improvement with minimal therapy

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Optometric Rehabilitative Treatment Of TBI

Main Goals of Rehabilitation are to Help the Patient:

- Eliminate or compensate for visual problems
- Become more independent
- Re-enter his/her former occupation or to be trained for a new one
- Improve daily living skills

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Optometric Rehabilitative Treatment Of TBI

Areas that must improve:

- Visual function-oculomotor, accommodation, binocularity, Visual Information Processing
- Motor function-General movement abilities, bilaterality, eye-hand (starting with primitive reflexes and balance)
- Patients intention and goals

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Optometric Rehabilitative Treatment Of TBI

Areas that must improve:

- Attention – especially visual attention
- Central-Peripheral integration (visual fields are usually collapsed)
- Ability to integrate multiple stimuli (huge problem – can't filter out stuff (auditory))

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OUR VISION GUIDES A BROAD SPECTRUM OF HUMAN ABILITIES

- Walking, Judgment of terrain
- Maneuvering between obstacles
- Positioning our car when driving
- Judging rate of approach
- Scanning in a crowd
- Alerting us to danger
- Sports: aiming, hitting and following a ball

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OUR VISION GUIDES A BROAD SPECTRUM OF HUMAN ABILITIES

- Tracking and the formation of letters.
- Tracking and the orientation on page.
- Tracking and reading.
- Scanning for books on a shelf.
- Threading a needle.



WHEN VISION IS LEFT OUT OF THE TREATMENT PLAN

- Some patients continue to struggle with post-concussion vision disorders



TEAM APPROACH CRITICAL TO PATIENT OUTCOMES

Barriers:

- Insufficient understanding between professions
 - Education in Neuroscience
 - Terminology – each field has different terminology
- Treatment bias based on perception there is lack of research or double blind studies
- Insurance Challenges




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CASE EXAMPLE

Jane, 19 year old Date of Injury: 12/20/16

List of symptoms:

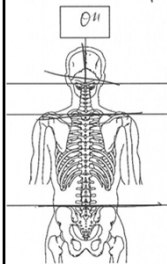


- Nausea
- Dizziness
- Blurry vision – distance and near
- Daily headaches
- Light sensitivity
- Noise sensitivity
- Difficulty reading

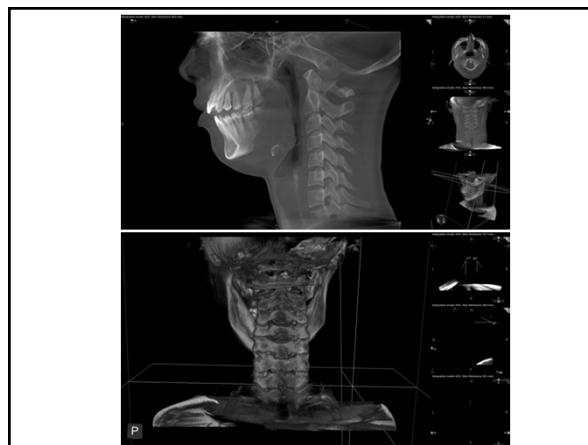
	1/11/17	5/17/17	1/10/18
Near Point of Conv.:	8"/12"	6"/10"	4"/6"
Cover Test:	6-8 XP'	6 XP'	6 XP'
Distance Phorias:	3 In	2 In	2 In
Near Phorias:	10 In	12 In	7 In
DBI:	x/12/4 pain	x/6/0 nausea	x/10/6
DBO:	x/12/6	x/8/2	x/10/6
NBI:	16/18/12 pain	x/12/6	x/10/6
NBO:	x/6/-2 nausea	x/6/0 nausea	x/10/6

CASE EXAMPLE

Treatments implemented:



- Nutritional Supplements from Natural Medicine Doctor
- Upper Cervical Chiropractic Care
- Neuro-Feedback
- Cranial Sacral Care



CASE EXAMPLE

Neuro-Optometric Rehabilitation Evaluation Jan 2017

- Convergence Insufficiency
- Post Traumatic Headache
- Spasm of Accommodation, Bilateral


Z-Bell (Patent No.: 7427136) testing revealed:

Blue tint helped improve spatial localization in conjunction with a small amount of prism

CASE EXAMPLE

Treatment plan:

- Therapeutic lenses
- Simple Rehabilitation activities



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CASE EXAMPLE

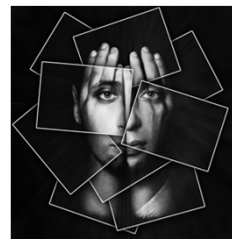
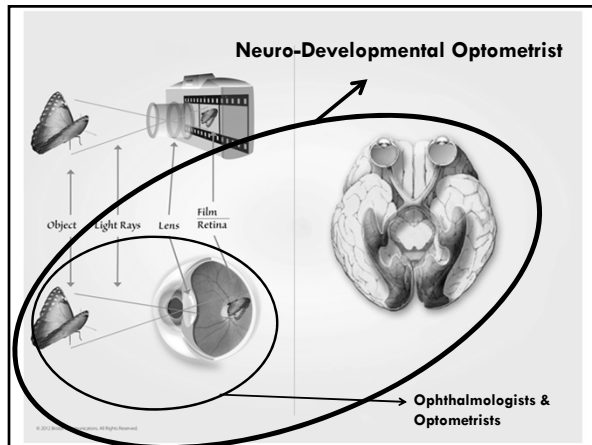
First Follow-up Visit 3 months later:

- Headaches no longer debilitating
- Minimal light sensitivity
- Decreased nausea and dizziness
- Blurry vision eliminated
- Can read large print for a couple of hours

Refer for a
Neuro-Optometric Vision
Rehabilitation Evaluation

With a Neuro-Developmental/Behavioural Optometrist

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GUIDING RESEARCH
TO IMPROVE PATIENT
OUTCOMES

Collaboration
Between
Professions

RESOURCES

www.NORAVisionRehab.org

www.OEPF.org

www.mindeyeconnection.com

RESOURCES

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THANK YOU!

**BLAIR UPPER CERVICAL
CHIROPRACTIC SOCIETY, INC.**

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