

Acquired Brain Injury: Vision is the Hidden Disability

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Rick Graebe, OD, FCOVD

Family Eyecare Associates

Children's Vision and Learning Center

105 Crossfield Drive

Versailles, KY 40383

859-879-3665

drgraebe@gmail.com

www.myfamilyvision.com

www.kentuckyvisiontherapy.com

"Eyes don't tell people what they see. People tell eyes what to look for!"

Acquired Brain Injury (ABI): vision is the hidden disability

- Over 50% of all ABI patients have a visual deficit. Many go undetected. Most all of these deficits can be improved.
- **How important is vision in the brain?**
 - There are over 1,900,000 nerve fibers that exit from each eye! This represents 70% of the sensory nerve fibers in the body.
 - There are 35 different areas in the brain primarily or totally involved with processing visual function.
 - There are over 305 intra-cortical pathways linking the 35 areas of the brain.
 - Every lobe of the cerebral cortex is involved in the processing of visual information.
 - There are more areas in the brain dedicated to vision than all other sense modalities combined.
- Eyesight is not vision! “Eyesight” is seeing it...“Vision” is the process of deriving meaning from what is seen
- 70-85% of perception, cognitive learning and activities are mediated through vision
- Vision leads other senses...it tends to be a bully and dominates other senses
- 70-85% of cells in brain are related directly or indirectly to vision system...not just visual cortex in occipital lobe (contribute to balance, dizziness, etc)
- Vision leads action (stops or starts action)
- Vision’s 3 general categories:
 - 1. Visual Acuity and Field
 - Associated visual field defects-hemianopsia
 - 2. Visual Motor Abilities/Visual Efficiency; and
 - 3. Visual Perceptual/ Processing
- Importance of fusion for binocular skills
- Visual Input Pathways: Central (parvo) and peripheral (magno) pathways
- Pineal gland input (melatonin-Serotonin) (intrinsically Photoreceptive ganglion Cell receptors: aka Melanopsin Ganglion Cells) (could be contributor to increase depression in ABI)
- **Different Models of Vision:** (Medical/structural=>functional=>behavioral)
 - Gathering
 - Processing
 - Integrating
 - Action
- Role of vision: extends our sensory experience past our physical reach, allowing us to “visually touch”; to tell us where we are in relationship to our environment,
- The power of lenses and prism in ABI therapy
- Yoked movement at distance vs. convergence and focus for near tasks
- Motor->Motor visual->Visual Motor->Visual
- Damaged pathways from ABI need to progress through same developmental steps as when we first learn visual skills
- Vision is learned initially; if these pathways get damaged, we need to re-establish the damaged pathways or create new ones—**The goal for any type of therapy is to create an environment in which the brain can obtain a meaningful experience** (See Norman Doidge book: the Brain that Heals Itself)
- Skeffington Circles and order of Development
- Unconsciously-Unskilled=>Consciously Unskilled(learning begins)=>Cons Skilled=>Unconsciously Skilled

Overview:

- *Vision occurs in the brain, not in the eyes.*
- *Vision is learned.*
- *Most ABI patients experience a visual deficit.*
- *If the visual pathways get damaged, the brain has neuroplasticity at any age. Vision can be re-learned and pathways re-established with the proper environment and stimulation.*

Other resources:

- **CavinBounce.com**
 - *This is the blog of Cavin Balaster, a brain injury recovery miracle. This has lots of great, positive information to assist ABI patients and their families.*
- **Nora.cc**
 - *This is the international website for the Neuro-Optometric Rehabilitation Association. This has doctor locators, and lots of great information for doctors and public.*
- **Visionhelp.wordpress:**
 - *This is a blog from Dr. Lens Press and other behavioral OD's with more information about vision therapy*
- **Covd.org**
 - *This is the website of the national organization of behavioral optometrists, with lots of useful information regarding vision therapy. It also has a VT doctor locator.*
- **OEPF.org**
 - *This is the website of the national organization that provides much of the education for behavioral optometrist. It also has a VT doctor locator.*
- **Optometrists.org**
 - *This is a website for consumers to help them locate vision therapy office in their area.*
- **Kentuckyvisontherapy.com**
 - *This is our vision therapy site.*