BAOD

A Vision Syndrome

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Does 20/20 visual acuity insure you can see a 3-ring circus?

What do you see in this picture?
Now do you see it?
Visual recognition is more than detail detection
The visual brain is more than the eyes and occipital lobe.

**KEY TO FUNCTION**

- **V1**: Primary visual cortex; receives all visual input. Begins processing of color, motion, and shape. Cells in this area have the smallest receptive fields.
- **V2, V3, and VP**: Continue processing; cells of each area have progressively larger receptive fields.
- **V3A**: Biased for perceiving motion.
- **V4v**: Function unknown.
- **MT/VS**: Detects motion.
- **V7**: Function unknown.
- **V8**: Processes color vision.
- **LO**: Plays a role in recognizing large-scale objects.

*Note: A V6 region has been identified only in monkeys.*
Vision...More than acuity

- Vision is a process
- Good vision requires the effective input of visual information
- Good vision requires the effective processing and integration of visual information
- Good vision is this culmination through which we make use of visual information
Vision...Input abilities

- **Binocular control**
  Ranges of fusion and integration with accommodation

- **Accommodative control**
  Amplitude, flexibility/facility and integration with binocular control

- **Oculomotor control**
  Fixations, pursuits and saccades
Vision...information processing

- Visual Spatial Orientation
  - Bilateral Integration
  - Laterality and Directionality
- Visual Analysis Skills
  - Visual Discrimination
  - Visual Figure Ground
  - Visual Closure
  - Visual Memory and Visualization
Vision...Integration Process

- Visual – Motor Integration
- Visual – Vestibular Integration
- Visual – Auditory Integration
- Visual – Verbal Integration
Plans and guides our effective movement
Substitutes for our need to move/touch to gather information
Is the dominant sense in human cognition by organizing, interpreting, understanding, storing and recalling information
Is the foundation for imagination...imagery
Vision...

- Is learned...

  It’s a developmental process!
Definition of a syndrome

- *n. Med.* An aggregate or set of concurrent symptoms indicating the presence and nature of a disease. *Funk and Wagnalls*
Recent evidence shows the existence of a visual syndrome that can often elude detection... but causes significant impairment.

- It affects a significantly high percentage of children and adults.
- It impacts reading and learning performance.
- It is often associated with behavioral/emotional problems.
- It has little or no impact on distance visual acuity leading to false negatives on acuity-based vision screenings.
BAOD Syndrome...
The vision triad that causes impairment

- Binocular
- Accommodative
- Oculomotor Dysfunction
## BAOD Syndrome...The vision dysfunction that causes impairment

<table>
<thead>
<tr>
<th>Binocular Dysfunction</th>
<th>Accommodative Dysfunction</th>
<th>Oculomotor Dysfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Overlapping letters/words in reading</td>
<td>• Reduced concentration for near visual tasks</td>
<td>• Moving head excessively when reading</td>
</tr>
<tr>
<td>• Diplopia</td>
<td>• Asthenopia when reading or writing</td>
<td>• Skipping lines when reading</td>
</tr>
<tr>
<td>• Headaches associated with near visual tasks</td>
<td>• Headaches associated with near visual tasks</td>
<td>• Omitting words and transposing words when reading</td>
</tr>
<tr>
<td>• Decreased attention for near visual tasks</td>
<td>• Photophobia</td>
<td>• Losing place when reading</td>
</tr>
<tr>
<td>• Asthenopia when reading or writing</td>
<td>• Transient blurred vision at distance or near</td>
<td>• Requiring finger or marker to keep place when reading</td>
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<tr>
<td>• Close near working distance</td>
<td></td>
<td>• Experiencing confusion during the return sweep phase of reading</td>
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<td></td>
<td></td>
<td>• Experiencing illusory text movement</td>
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<td></td>
<td></td>
<td>• Having deficient ball-playing skills</td>
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</tbody>
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BAOD Syndrome...

Common signs and symptoms profile

- Struggling in reading efficiency
- Headaches, eye strain, words overlap
- Frustration with sustained close work (ex: homework)
- Poor attention/concentration (ADD-like behaviors)
- Poor memory/comprehension
Binocular, Accommodative Oculomotor Disorders

In Children with Learning Problems

AOA Clinical Practice Guideline: Care of the Patient with Learning Related Vision Problems (pg 7,13):

- The prevalence of visual efficiency (binocular, accommodative, motility) problems are thought to be in the 15-20% range.\(^{67-69}\)
- Accommodative dysfunctions have been reported to occur in 60-80% of individuals with vision efficiency problems.\(^{21}\)
- Convergence Insufficiency (CI) is one the most common binocular vision anomalies.\(^{21}\)
- “Deficiencies in ocular motility have been associated with learning problems.”\(^{86-92}\)
1. Begin to look for the *BAOD Syndrome* symptom profile in all patients, especially children.

- Create a simple checklist in your history repertoire. Look for:
  - Struggling in reading efficiency
  - Headaches, eye strain, words overlap
  - Frustration with sustained close work (ex: homework)
  - Poor attention/concentration (ADD-like behaviors)
  - Poor memory/comprehension
What will you do? It’s as easy as 1…2…3…

2. Check for some of the key clinical findings to make the Diagnosis:

- Reduced Near Point of Convergence
- Excessive Exophoia or Esophoria at near
- Reduced Positive Fusional Vergence
- Low accommodative abilities (PRA, NRA or Facility)
- Poor oculomotor skills (pursuits, saccades, fixations)
3. **Direct a plan of patient management**

- **Provide office-based, doctor supervised optometric vision therapy** or...
- **Refer to a colleague who specializes in developmental vision and vision therapy care and provides competent office-based, doctor supervised optometric vision therapy**
Initial comprehensive diagnostic vision evaluation
Assessment of visual information processing
Consultation
Treatment
- Doctor supervised office-based VT (OBVT) along with home activities. Patient sessions 1-2 times per week
- Periodic progress evaluations with the doctor
- Exit evaluation with the doctor to confirm patient has reached automaticity in visual function
- 3 month post vision therapy evaluation with the doctor to verify patient has maintained visual function
Benefits of treating BAOD

- You will be appreciated by your patient – they will experience greater success through better vision.
- You will be appreciated by your patients' family and the community...as a doctor who really cares.
Where to Get More Information

- American Optometric Association Clinical Practice Guideline:
  - *Care of the Patient with Learning Related Vision Problems (AOA-CPG 20)*

- Websites:
  - www.covd.org
  - www.aoa.org
  - www.oepf.org

- College of Optometrists in Vision Development (COVD) Annual Meeting:
  - *Applied Concepts Courses*

- Optometric Extension Program Foundation:
  - *Regional Clinical Seminars*
Where to Get More Information

Recommended Books:

- Applied Concepts in Vision Therapy
  Press LJ. OEPF 2008

- Binocular Anomalies: Diagnosis and Vision Therapy
  (4th ed.) Griffin, JF, Grisham JD, Butterworth-Heinemann 2002

- Clinical Management of Binocular Vision:
  Heterophoric, Accommodative, and Eye Movement Disorders
  Scheiman M. Wick B. Lippincott 2008