



The Effectiveness of Neurofeedback for Amblyopia (Lazy Eye) in Children

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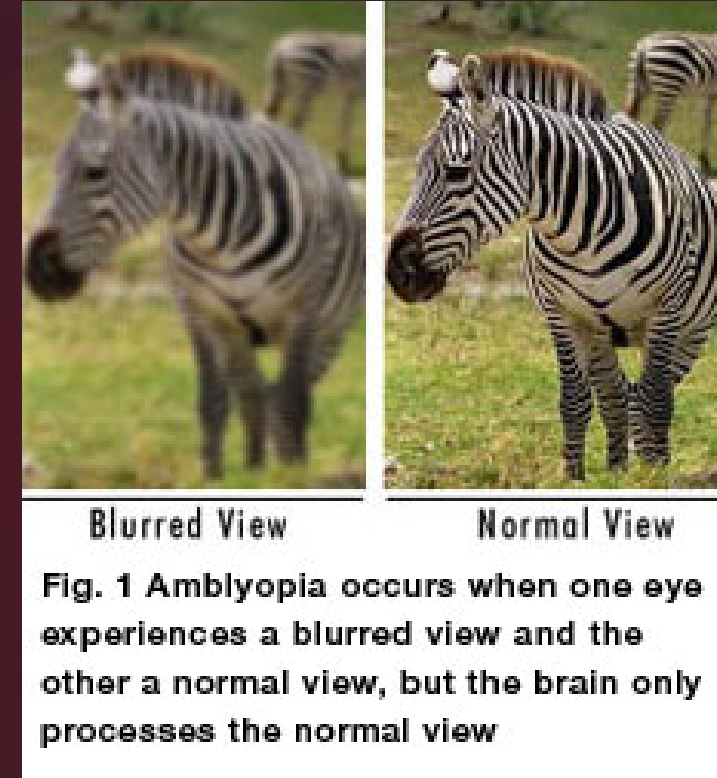
Amblyopia (Lazy Eye) in Children

Amblyopia (Lazy Eye) is when vision in one or both eyes does not develop properly during childhood.

Vision loss occurs because nerve pathways between the brain and the eye aren't properly stimulated. The brain “learns” to see only blurry images with the amblyopic eye even when prescriptive glasses are used

Amblyopia is affected by vision centers in the brain; whereas myopia/hyperopia is by abnormal structure of the eye cornea.

➔ Neurofeedback can help improve vision for amblyopia, but not myopia/hyperopia.



Source:

<https://www.aapos.org/terms/conditions/21>

Evaluating Progress & Successful Rate

Dr. Namtran H. Pham, M.D, Ophthalmologist, formerly served in US Air Force - is the first doctor, in Vietnam, to recognize and apply Neurofeedback for amblyopia. Under her supervision, I provide Neurofeedback training to 12 patients (ages from 5-13) with frequent vision screenings, once every 12 sessions.

Evaluation of progress through 3 channels:

1. Professional vision screening - measuring vision acuity of each eye by having patients read lines/pictures on a chart at a fixed distance.
2. Parents' observation of their children's improvement in reading/writing skills, eyes movement, attention to details, etc.
3. Patients' self-report in less blurry vision, better and clearer vision (especially in the dark/at night), able to see better at far distance.

Successful rate is 80% after 20 sessions, in which 20% with other complications (ex: seizure, anisometropia, strabismus) show no improvement after first 20 sessions. However, after 40 sessions is 100% successful rate.



Treatment Protocol

- VISION SCREENING before Neurofeedback (NF) training

NF Session 1-3: choose starting sites: T3-T4 or T4-P4 or both T3-T4 & T4-P4; optimize training frequency

NF Session 4-8: Train all 5 major sites: T3-T4, T4-P4, T4-FP2, T3-FP1, T3-P3

NF Session 9-12: Train frontal sites for amblyopia: T3-F3 (RIGHT eye); T4-F4 (LEFT eye); plus any other needed sites

- VISION SCREENING after 12 sessions

NF Session 13-20 and so on: Train frontal sites for amblyopia: T3-F3 (RIGHT eye); T4-F4 (LEFT eye); plus any other needed sites

- VISION SCREENING after 20 sessions, 32 sessions, 40 sessions, etc.

*** Train 2 sessions per week

Same results if train 2 sessions in 2 days/week OR 2 sessions in 1 day/week

Most Successful Case

Age: 7 Male

- Amblyopia, Right eye corneal scar
- Blurry vision, not able to see far, reading and writing difficulty
- Sleeps in class daily and sleeps most of the time at home
- Distractibility, difficult in focus and concentrating when study (15 minutes)

VISION SCREENINGS:

	Before Neurofeedback	12 sessions	20 sessions	32 sessions	40 sessions
Right eye	0.5/10	0.5/10	0.8/10	3/10	3/10
Left eye	0.3/10	4/10	7/10	8/10	8/10

*Note: 10/10 (notation standard in Asia) = 20/20 (notation standard in North America)

Evaluating Progress:

- Improve in vision acuity
- No more blurry vision, able to see from far distance, reading and writing faster and better
- No more frequent sleepiness
- Able to focus in study and much less distractibility (1 hour)

Most Successful Case

Thứ hai ngày 26 tháng 2 năm 2018
Tiếng Việt (bổ sung)
Rèn chính tả. Ôn luyện từ và câu.

1. Nghe - viết:

Quả tim khi

Một ngày nắng đẹp, sáng
báo trời xuân. Hàng dừa ven sông,
đều đứng nghe một tiếng quây
mạnh dưới nước. Một con vịt bơi
xuân dài thượt, nhẹ nhàng
sông như lướt như một lưỡi
cưa đất, trôi lên bãi cát.
Nó nhìn thì bằng cặp mắt tí
hí với hàng nước mắt chảy dài.

BEFORE

Thứ hai ngày 9 tháng 4 năm 2018
Tiếng Việt (bổ sung)
Ôn tập làm văn

Đề: Viết một đoạn văn 6-8 câu kể về một
loại cây ăn quả mà em thích.

Bài làm

Trong vườn nhà của bà em có nhiều loại cây ăn
quả, em thích nhất là cây xoài. Cây xoài rất cao to
cho em thật nhiều quả. Thân cây to, chia thành nhiều
cành cây với nhiều tán lá. Lá xoài có màu xanh, cây
cây trồng ở những chiềm quả nặng trĩu. Vào mùa xoài
chín, những chùm xoài trĩu quả bước giờ ăn. Đó, xoài
hết trái và quả mọc ra, có màu vàng ươm, ngọt lịm
em rất yêu thích vì xoài cho em vị ngọt và ngon.

AFTER

Lessons learned

- Neurofeedback yields fast results
- Faster results at younger age
- Other medical conditions slow down the results or may cause results to fluctuate
- Very important to work closely with an ophthalmologist to:
 1. Reassess and track progress because the improvement not obvious by parents' observation, vision screening measurement is more reliable
 2. Identify which case to continue and which to stop due to complications

What next?

- Add Occipital sites: T4-O2 (Left eye); T3-O1 (Right eye):
 1. to target visual processing
 2. to enhance visual deficits for patients with traumatic brain injury, premature birth, oxygen deprived at birth.