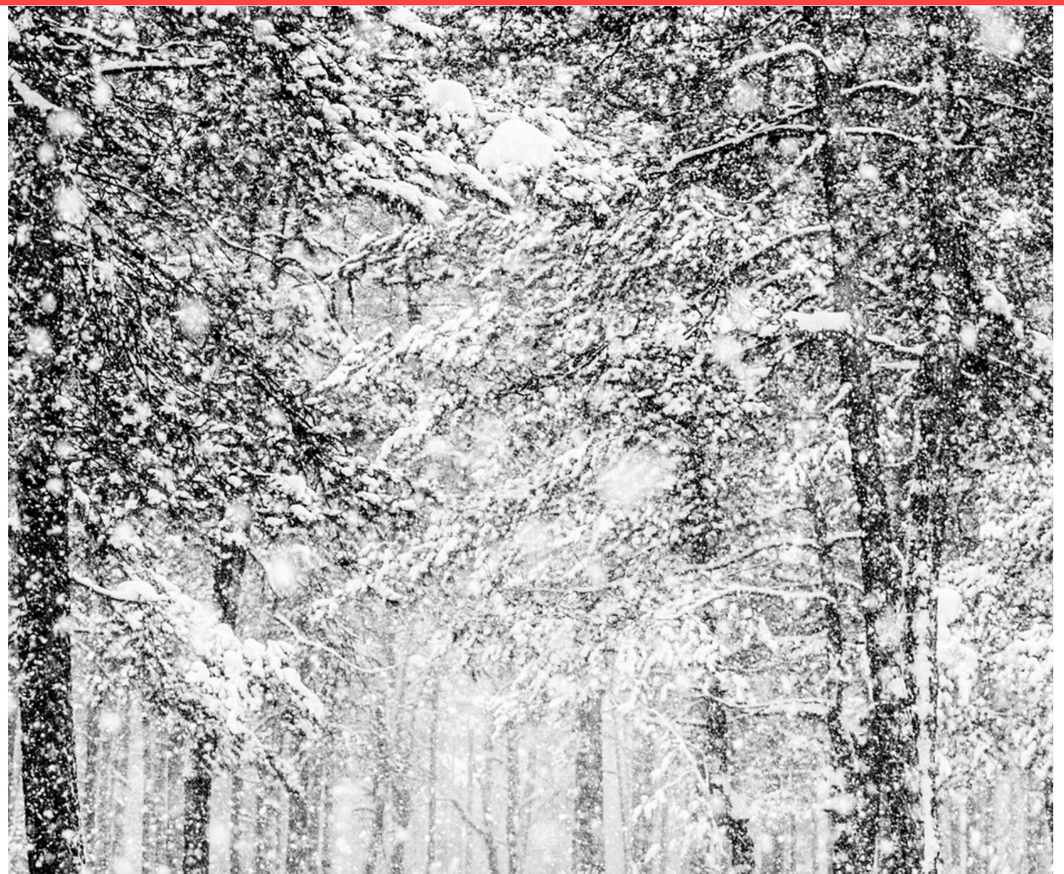
www.BrendaMontecalvo.com

SYNTONIC CASES

Optometric Phototherapy

Brenda Montecalvo, OD, FOVDR, FAAO, FCSO

Visual Snow Syndrome (VSS)



A neurological disorder that impacts an individual's vision, hearing, cognition, sensory processing, and quality of life. Visual snow can be described as seeing static, flickering dots, and flashing lights 24/7 (with your eyes open or closed).

- Photophobia
- Enhanced entoptic phenomena
- Floaters
- Palinopsia
- Nyctalopia

2.2 % of the population, identified in 93 countries.

Visual Snow Syndrome (VSS)

- **Eye Movements**

  VSS has a distinct saccadic profile.

- **White matter**

  Atypical visual processing and conceptualization

- **Secondary Psychological Affects**

  Depression, anxiety, de-personalization, sleep, fatigue, and quality of life

Kondziella D, Olsen MH, Dreier JP. Prevalence of visual snow syndrome in the UK. Eur J Neurol. (2020) 27:764–72.

https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2021.697923/full

Control Group

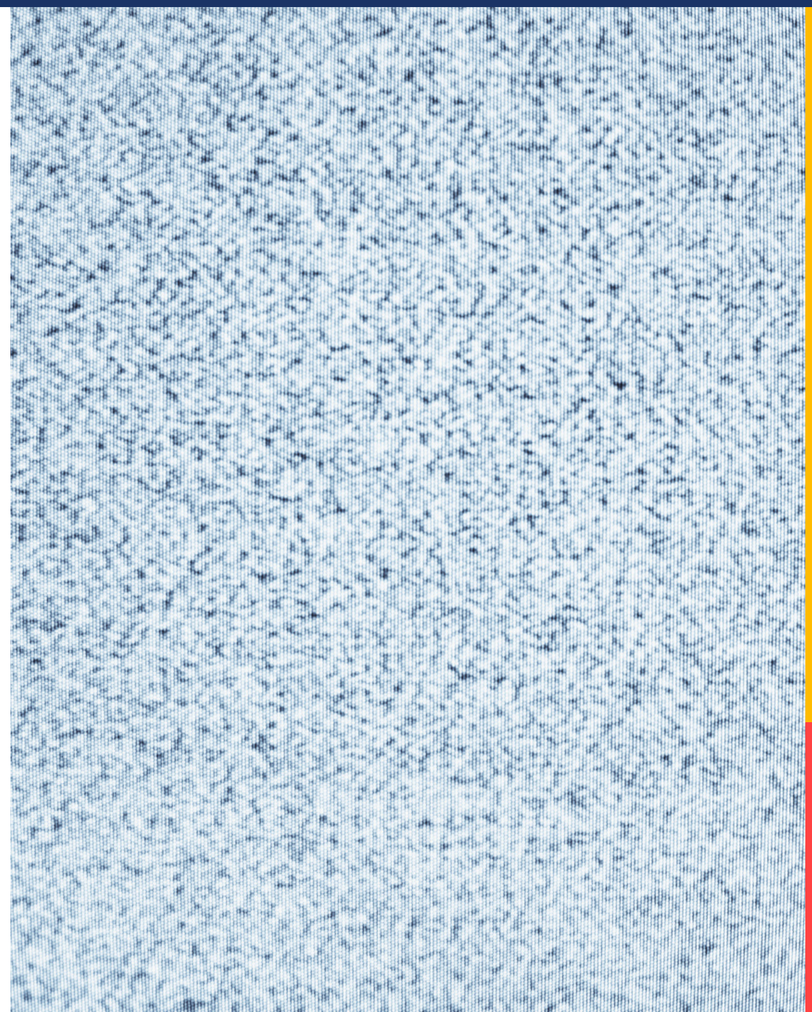
Showed a slight preference for one of two spectral regions which provided “visual comfort”, namely red-orange and turquoise-blue

VSS Group

Showed preference for one of two spectral regions which relieved VS symptoms, namely orange- yellow and turquoise-blue

VSS Group

Showed a strong negative preference for a spectral blue-violet region which exacerbated VS symptoms.



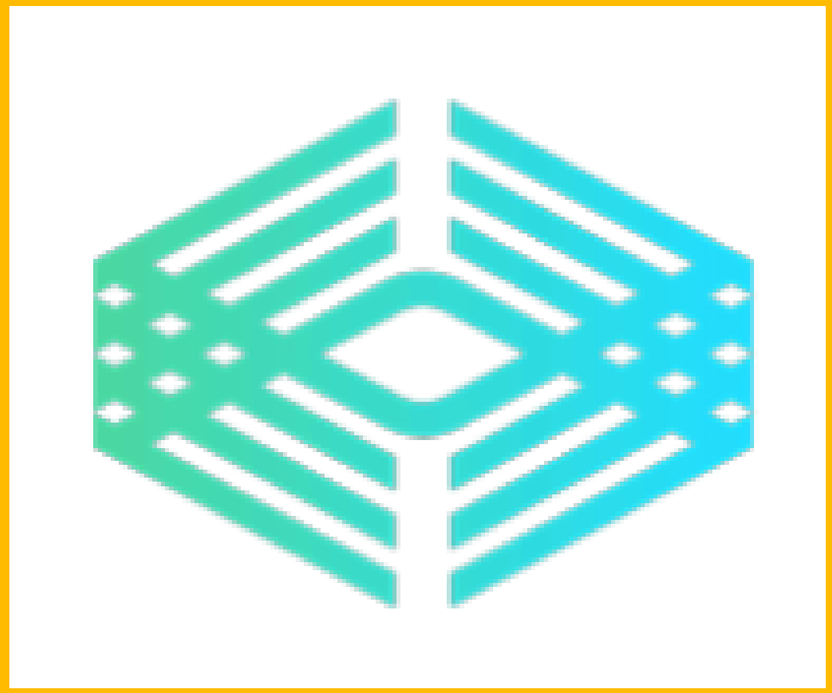
2021 study published in
Frontiers in Neurology

VISUAL
SNOW
SYNDROME

Showed that blue light makes visual snow syndrome worse.

Blue light activates a primitive part of the brain that controls neurological pulses called cortical rhythms. Jul 7, 2022

Visual Snow Institute



Global awareness, education, resources, patient advocacy, treatment development, and research for VSS.

visualsnowinstitute.org

Case 1: Visual Snow

14 YO

Recent onset of visual disturbance that is unresolved after several examinations by a variety of physicians and optometrists.

Pykinic

Low metabolic rate

Myopic

Exophore

Hypertension

Hypothyroid

Asthenic

High metabolic rate

Hyperopia

Esophoria

Hypotension

Hyperthyroid

OBSERVATION

Case History

Differentiate

Duration of problem

Strabismus

Amblyopia

- [x] Headache
- [x] Depression
- [x] Anxiety

Visual Snow 14yo	Initial Visit	Final Visit
Visual Acuities	6 M OD: 20/40 OS: 20/30 40 cm OD: 20/50 OS: 20/30	6 M OD: 20/20 OS: 20/20 40 cm OD: 20/20 OS: 20/20
Entrance Skills	CT 6M ortho 40cm EP EM P:Mod. loss S:over AA 15" NPC 8/7"	CT 6M ortho 40cm ortho EM P: S&A AA 3" NPC 2/1"
Subjective Refraction	OD Plano OS Plano	OD +0.25 sph OS +0.25 sph
Phorias & Ductions	6 M ortho 40 cm 3 xp	6 M. ortho 40 cm ortho
Accommodation	NRA +2.25 PRA -0.50	NRA +2.50 PRA. -3.00
Final Rx	OD plano 1/4pd BD +-.75 add exec OS plano 1/4pd BD +-.75 add	OD plano 1/4pd BD +-.75 add exec OS plano 1/4pd BD +-.75 add

Further Testing	Final Visit
Groffman	12 years
DEM	11 years
Keystone	Convergence escess with diplopia
MKM	Lines moved
VMI	13,5 years
TVPS	Vis discrim: 43% Form Const 46% Seq mem 23%

ALPHA OMEGA PUPIL

High Level of Stress

Graded 2

Rebound

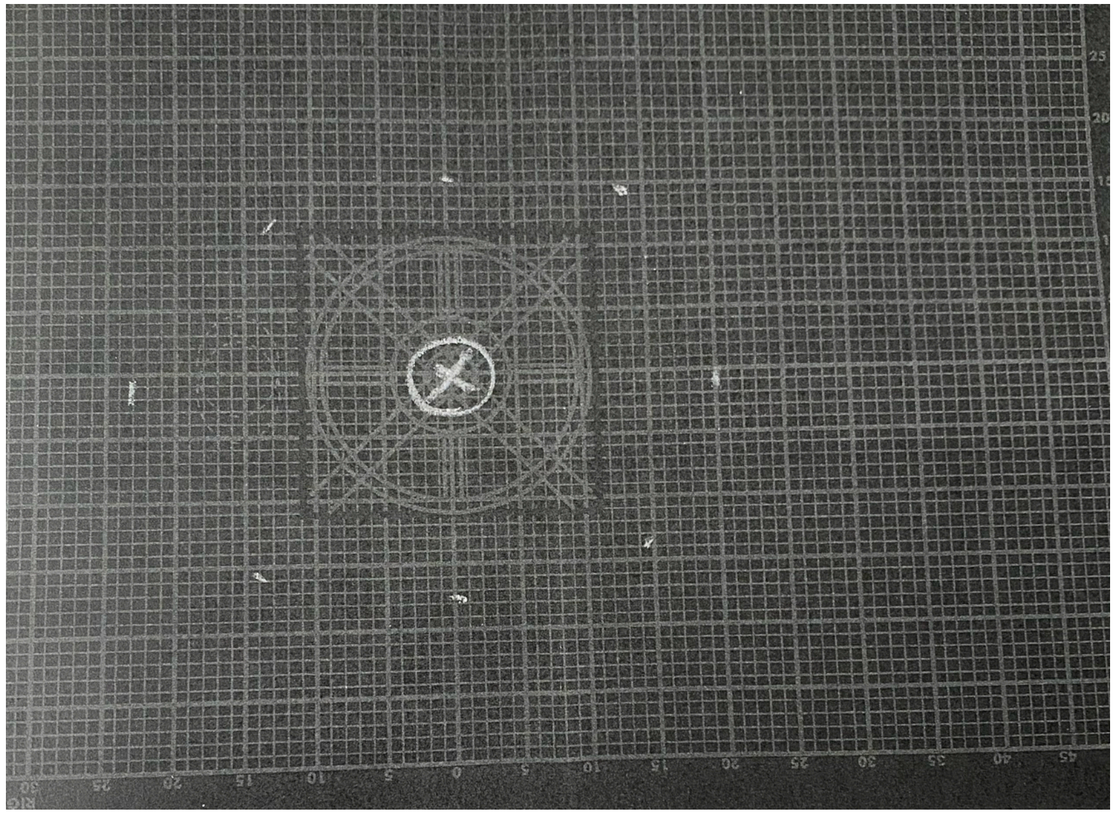
Fast rebound: asymmetry of ANS

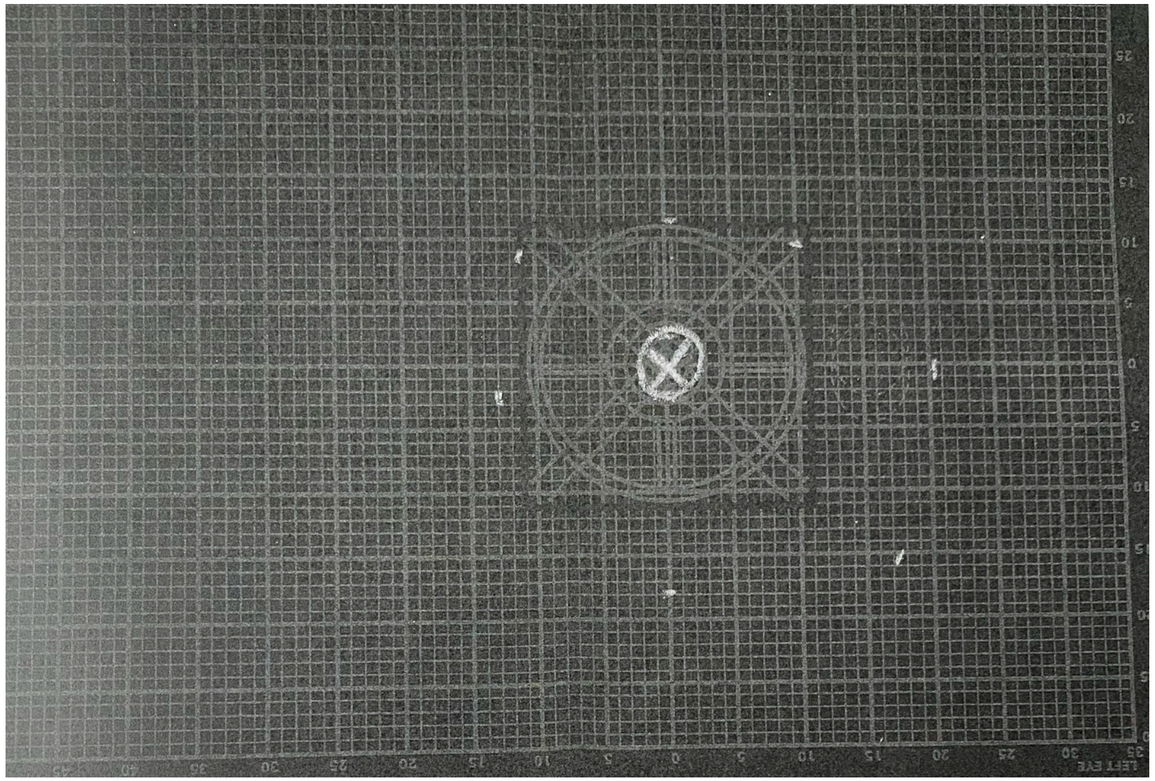
Ability to hold constriction

Poor

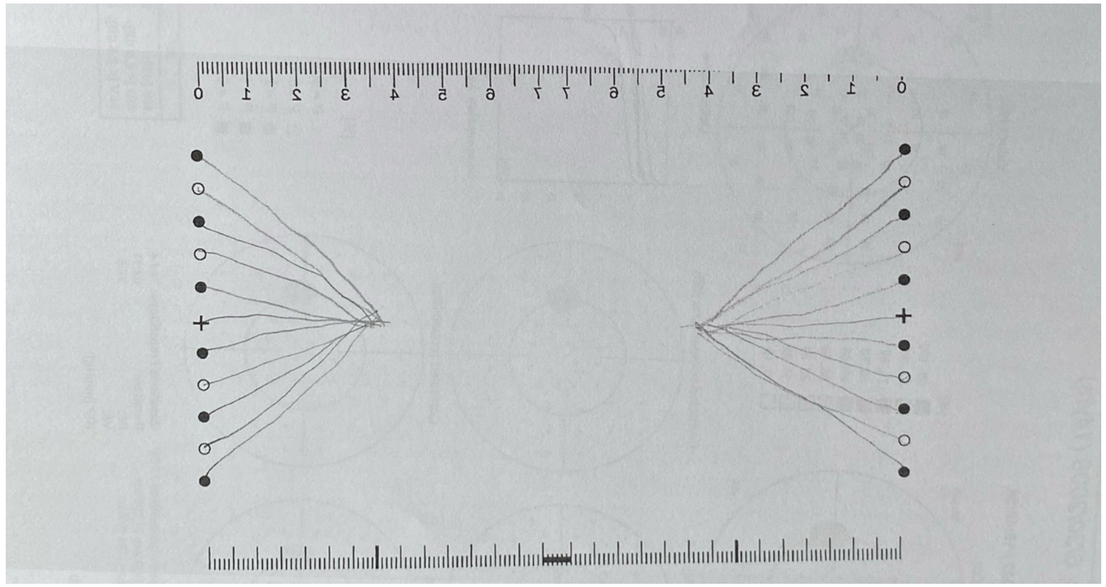
Visual Snow: Fields

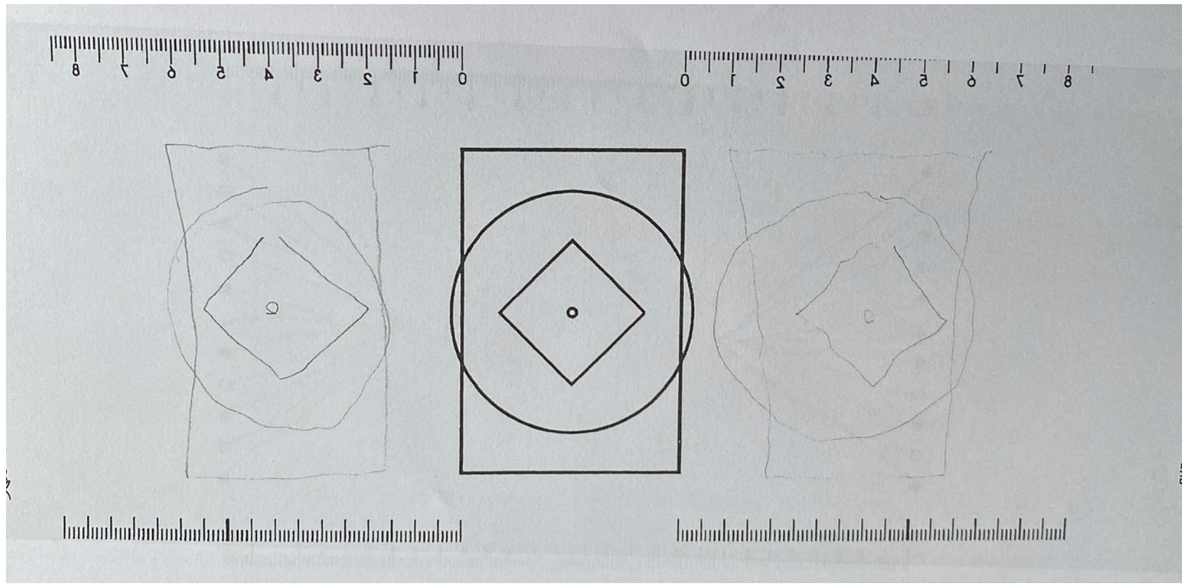
1. Alpha Omega
2. Alpha Delta MuDelta



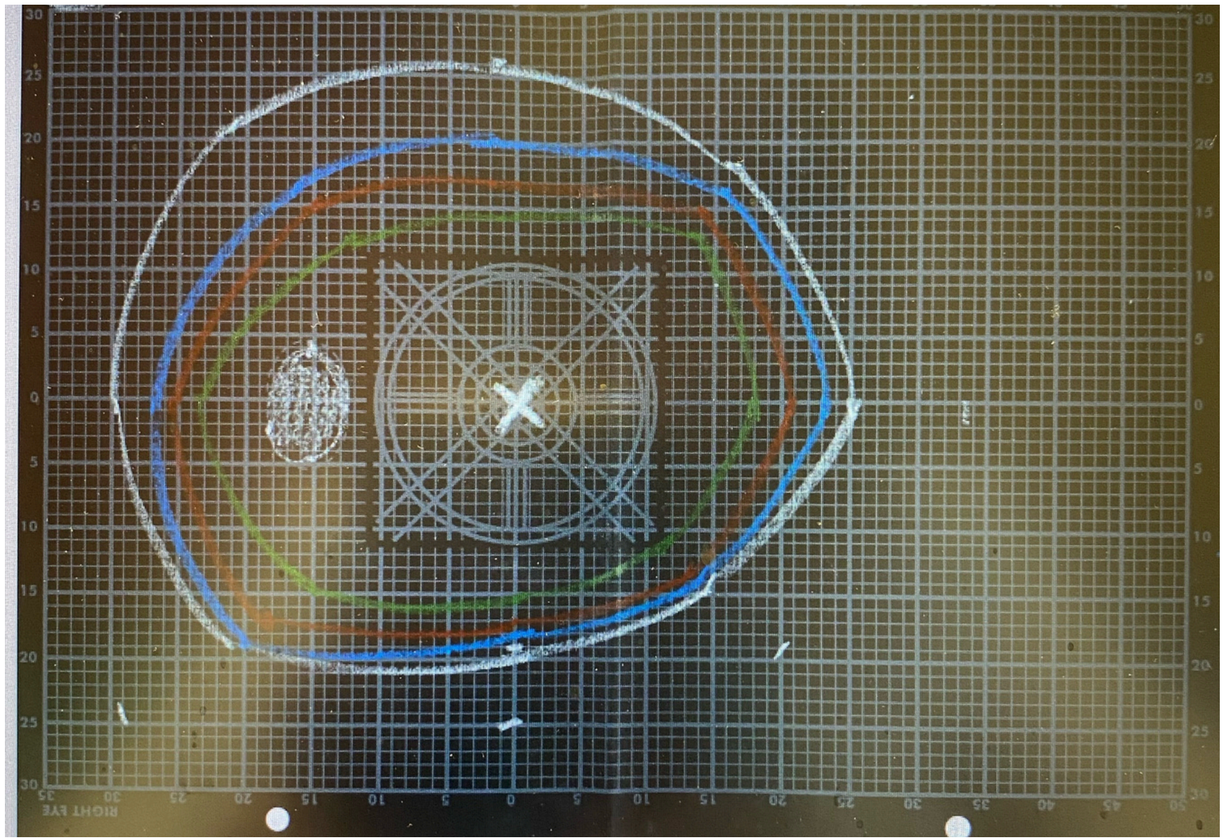


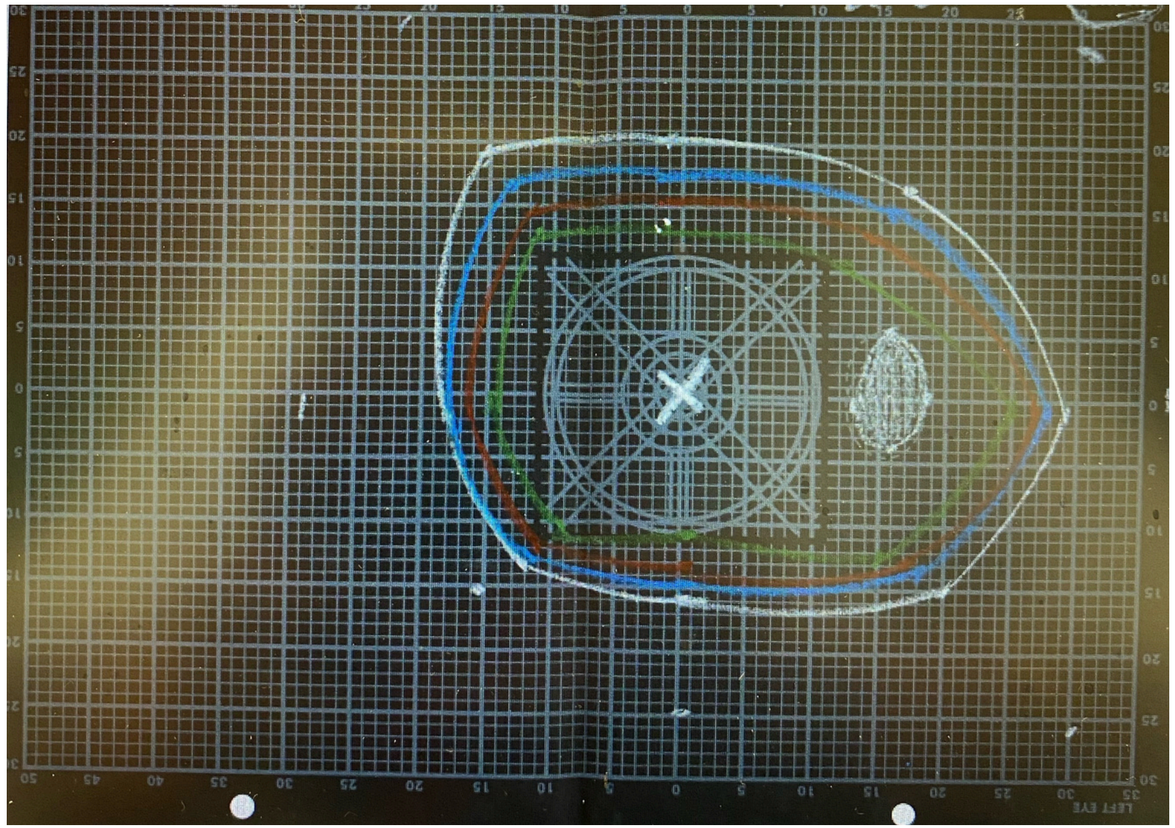
Visual Snow: Tracings



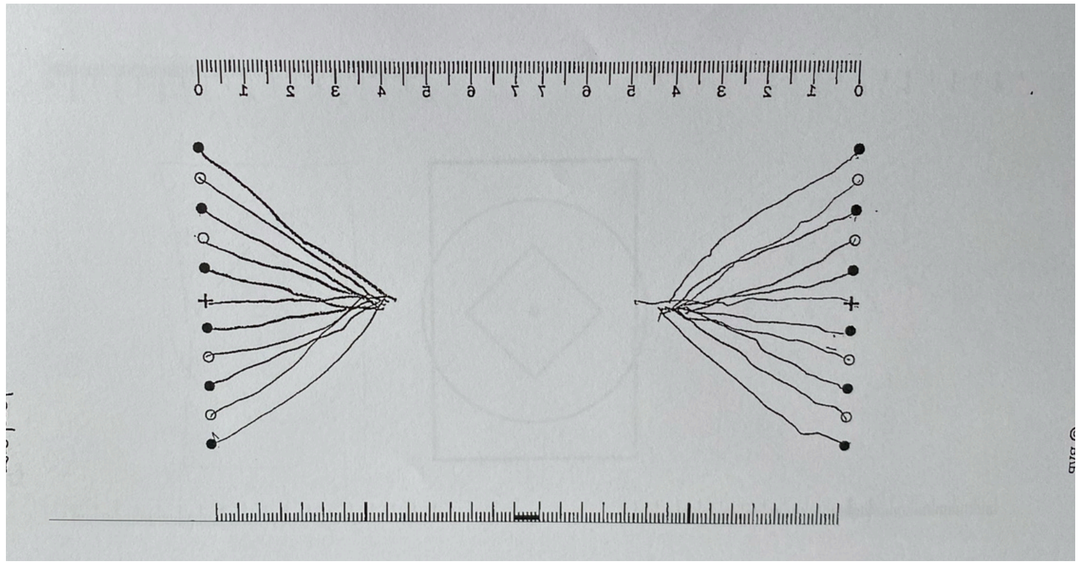


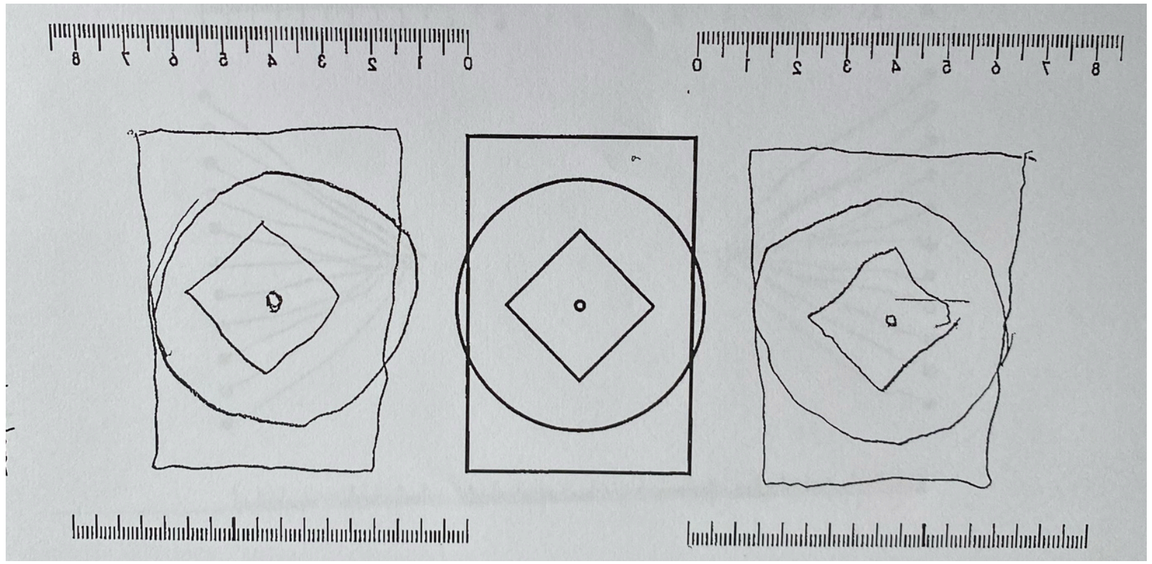
Visual Snow: Fields Post Treament





Visual Snow: Tracings Post Treament





Nystagmus

INCIDENCE

1 in 1000 for general population

Case 2: Nystagmus

5 YO FEMALE

Well adjusted. Beginning to read. Happy child with congenital nystagmus. Very supportive family environment.

Pykinic

Low metabolic rate

Myopic

Exophore

Hypertension

Hypothyroid

Asthenic

High metabolic rate

Hyperopia

Esophoria

Hypotension

Hyperthyroid

OBSERVATION

Case History

Differentiate

Duration of problem

Strabismus

Amblyopia

Headache

Depression

Anxiety

Nystagmus 5yo	Initial Visit	Final Visit
Visual Acuities	6 M OD: 20/60 OS: 20/60 40 cm OD: 20/70 OS: 20/70	6 M OD: 20/25 OS: 20/25 40 cm OD: 20/30 OS: 20/30
Entrance Skills	CT 6M ortho 40cm IXT EM P:Poor lg loss S:over AA 4' NPC 3'/4'	CT 6M ortho 40cm XP EM P: Full, nyst AA 3" NPC TTN
Subjective Refraction	OD +4.50 -3.50 x 003 OS +5.25 -4.25 x 177	OD +3.50 -3.50 x 005 OS +4.50 -4.00 x 167
Phorias & Ductions	6 M Suppresssion 40 cm Suppression	6 M. 1 XP 40 cm 12 XP
Accommodation	NRA Blur PRA Blur	NRA +1.50 PRA. -2.00
Final Rx	OD +3.50 -3.50 x 005 +1.25 add OS +4.00 -4.00 x167 +1.25 add	OD +3.50 -3.50 x 005 +1.25 add OS +4.00 -4.00 x167 +1.25 add

Further Testing	Final Visit
VMI	7 years
Wachs	6 years
Draw a man	9 years
Keystone	Fusion 1 & 2 degree ortho, no 3 degree

ALPHA OMEGA PUPIL

High Level of Stress

Graded 1

Rebound

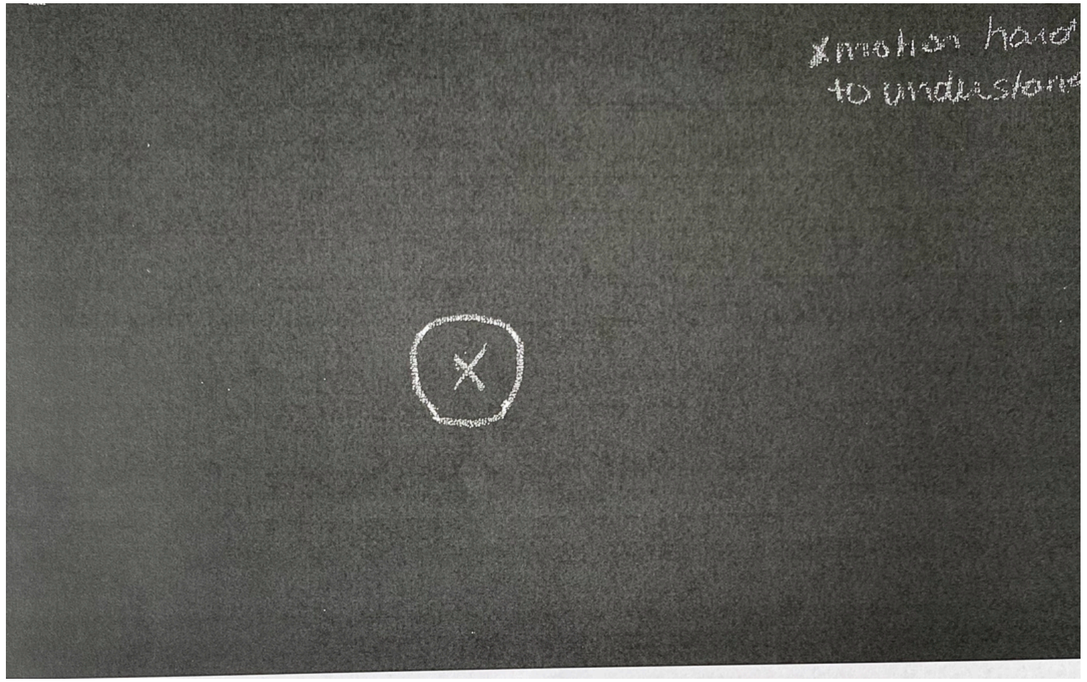
Fast rebound

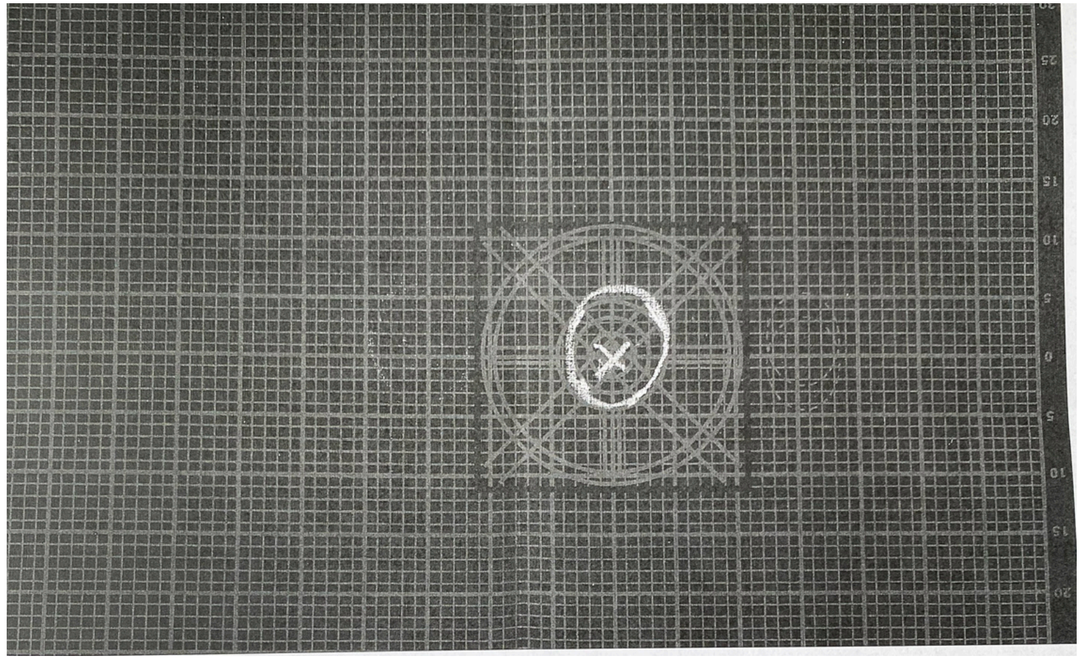
Ability to hold constriction

Poor

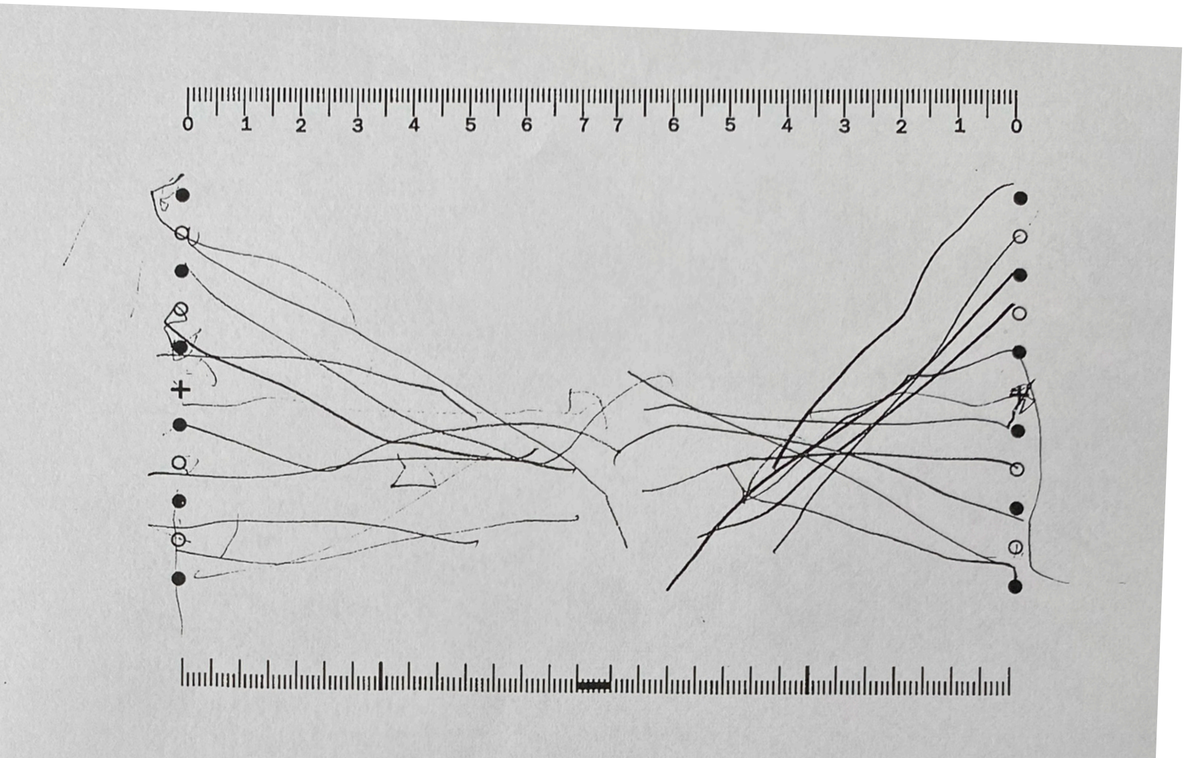
Nystagmus: Fields

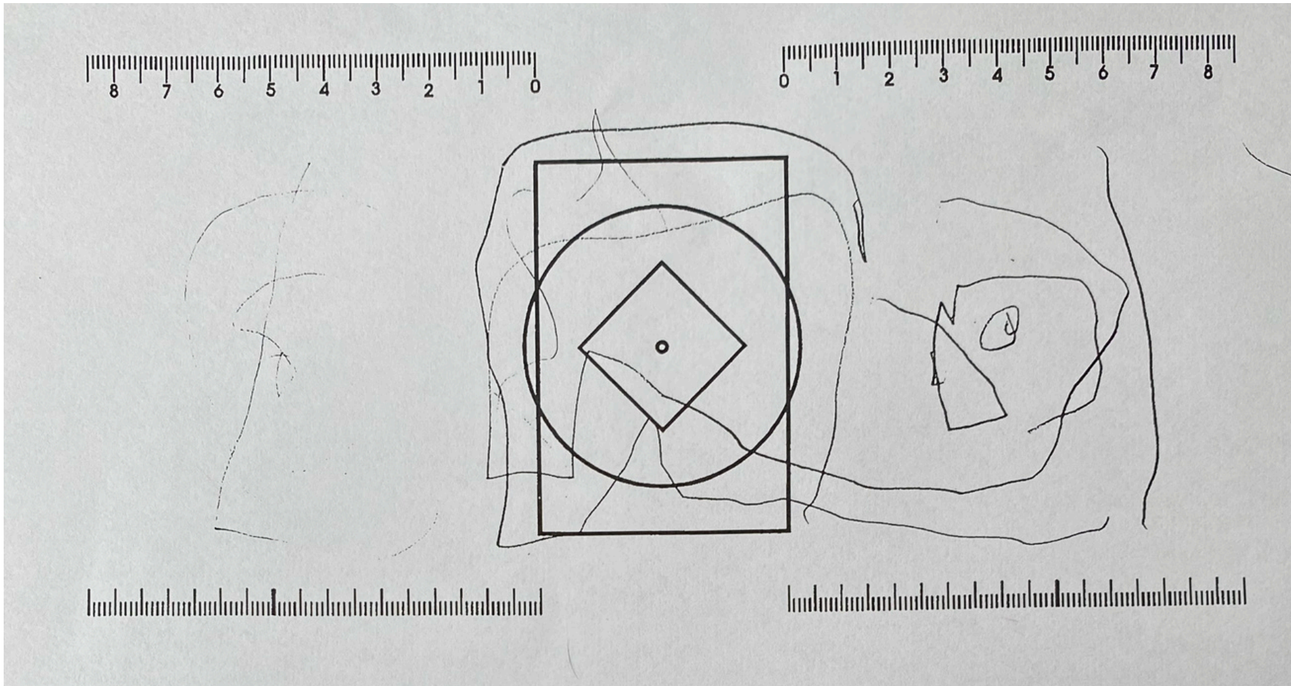
1. Omega
2. Upsilon/Omega
   Mu/Delta



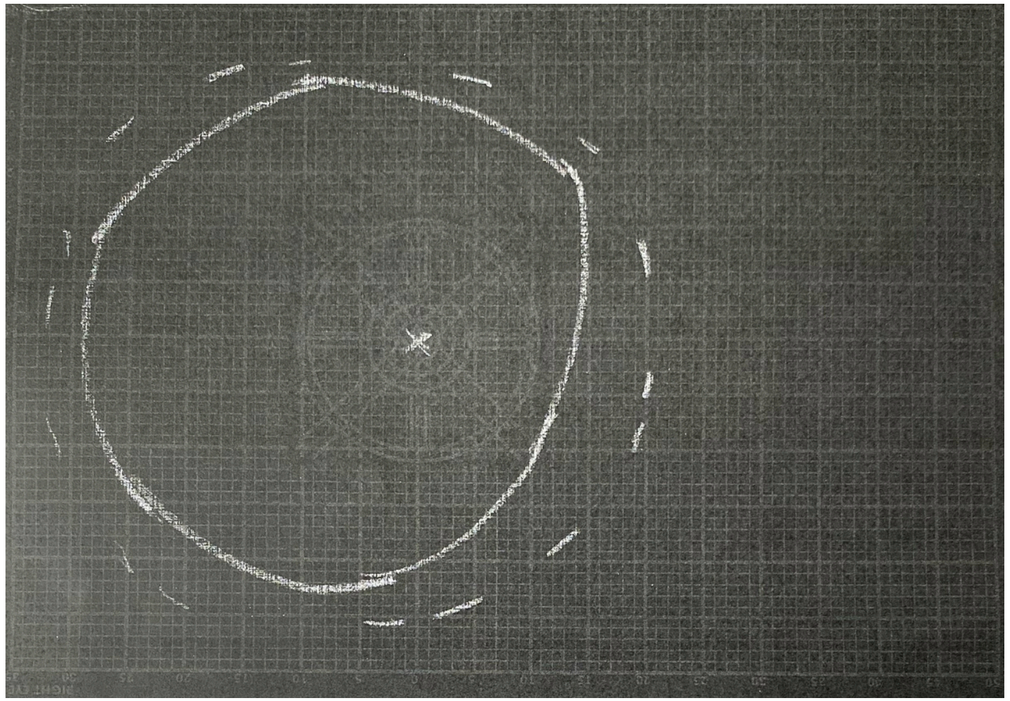


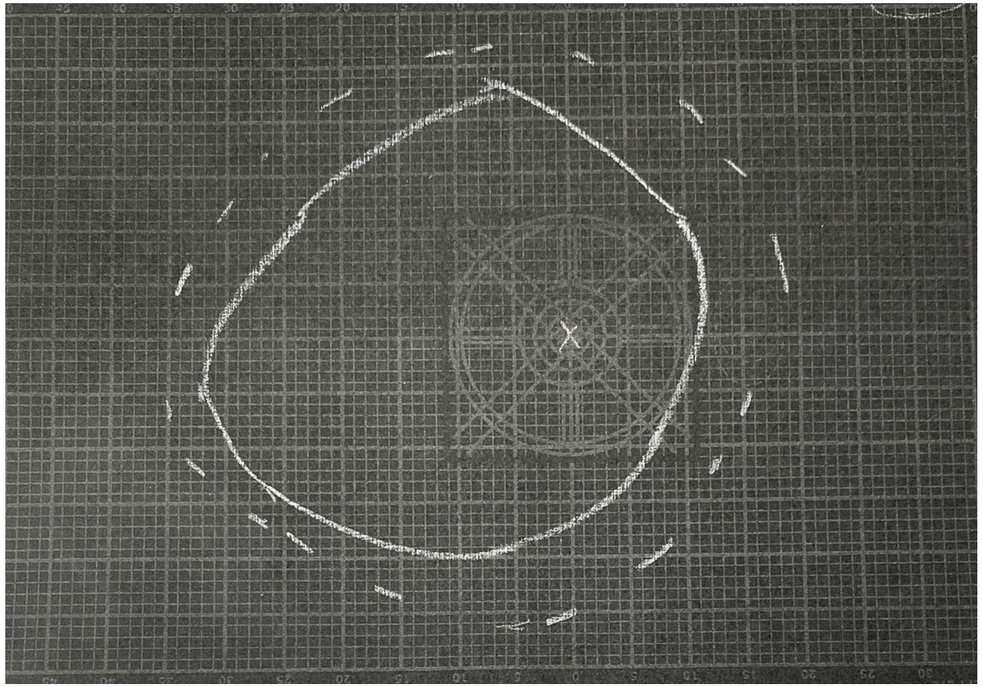
Nystagmus: Tracings



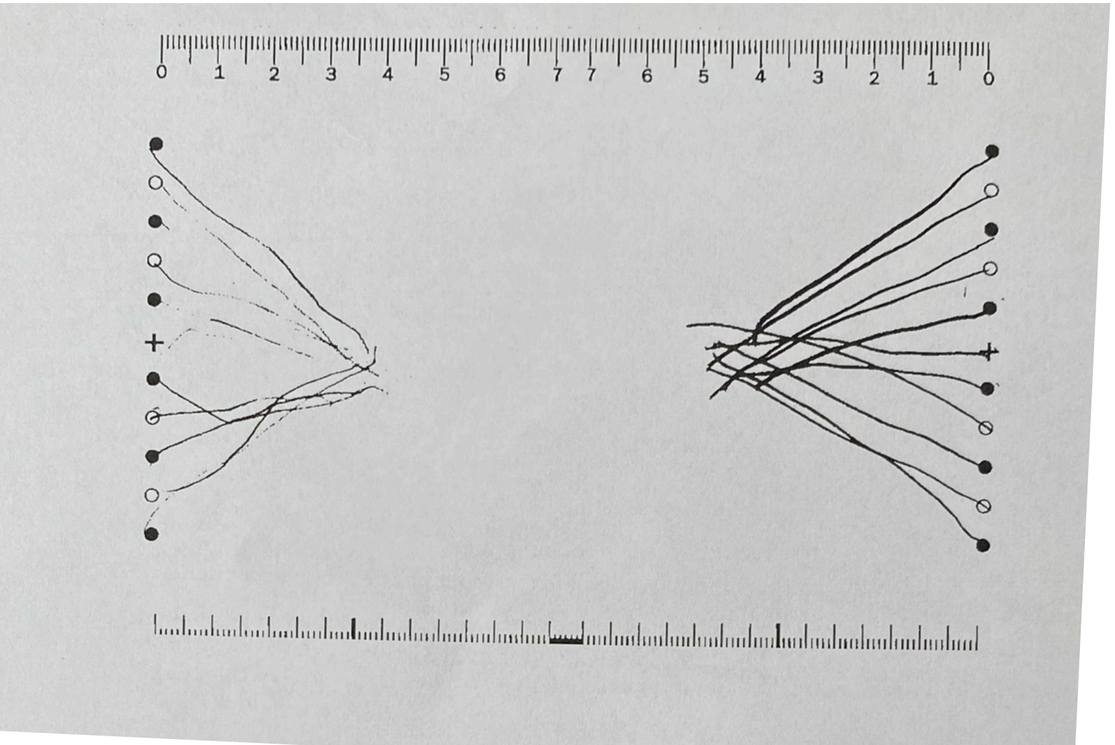


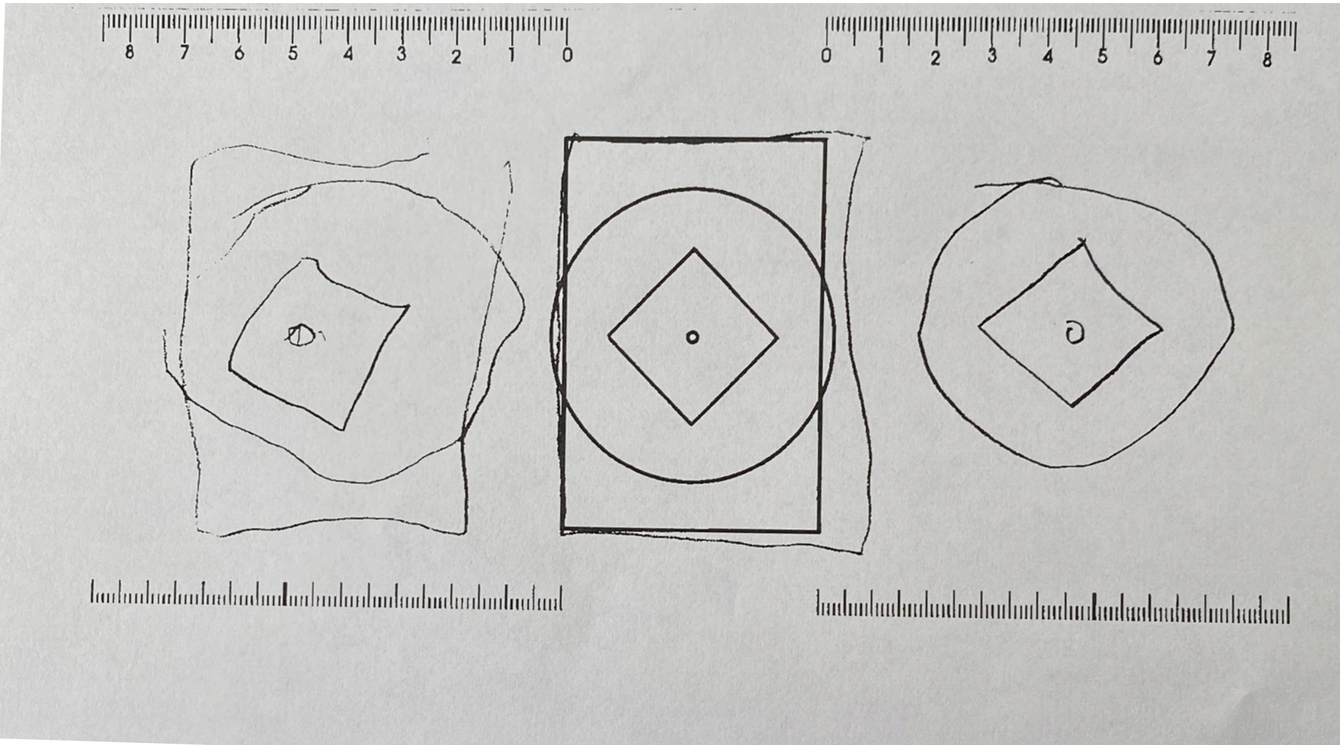
Nystagmus: Fields Post Treatment





Nystagmus: Tracings Post Treatment





Vertigo

15-20%

Dizziness, including vertigo, affects about 15% to more than 20% of adults yearly in large population-based studies.

Neuhauser HK. The epidemiology of dizziness and vertigo. Handb Clin Neurol. 2016;137:67-82.

Vertigo

VIOLET

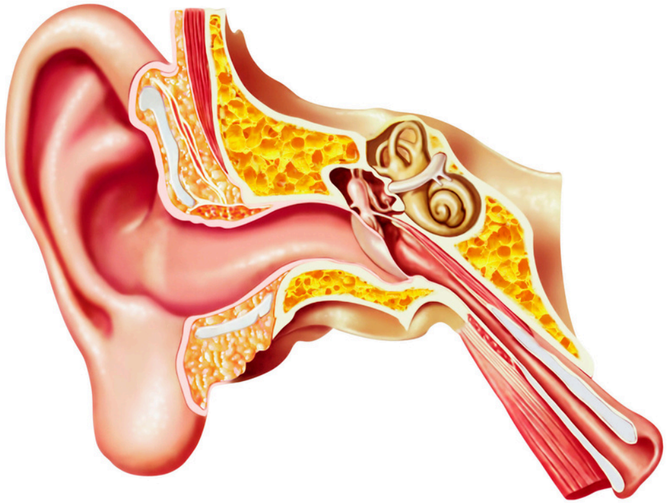
Violet color affects the central nervous system and pituitary gland. Often used for depression, Parkinson's, schizophrenia, epilepsy, senile dementia, Alzheimer's, mental disorders, **dizziness** and fuzzy thoughts.

Vertigo

PHOTOBIOMODULATION

Used for vertigo due to its ability to reach deep inner ear organs such as the cochlea. Previous reports have suggested that photobiomodulation can improve hearing and cochlea function.

Vertigo: LLLT

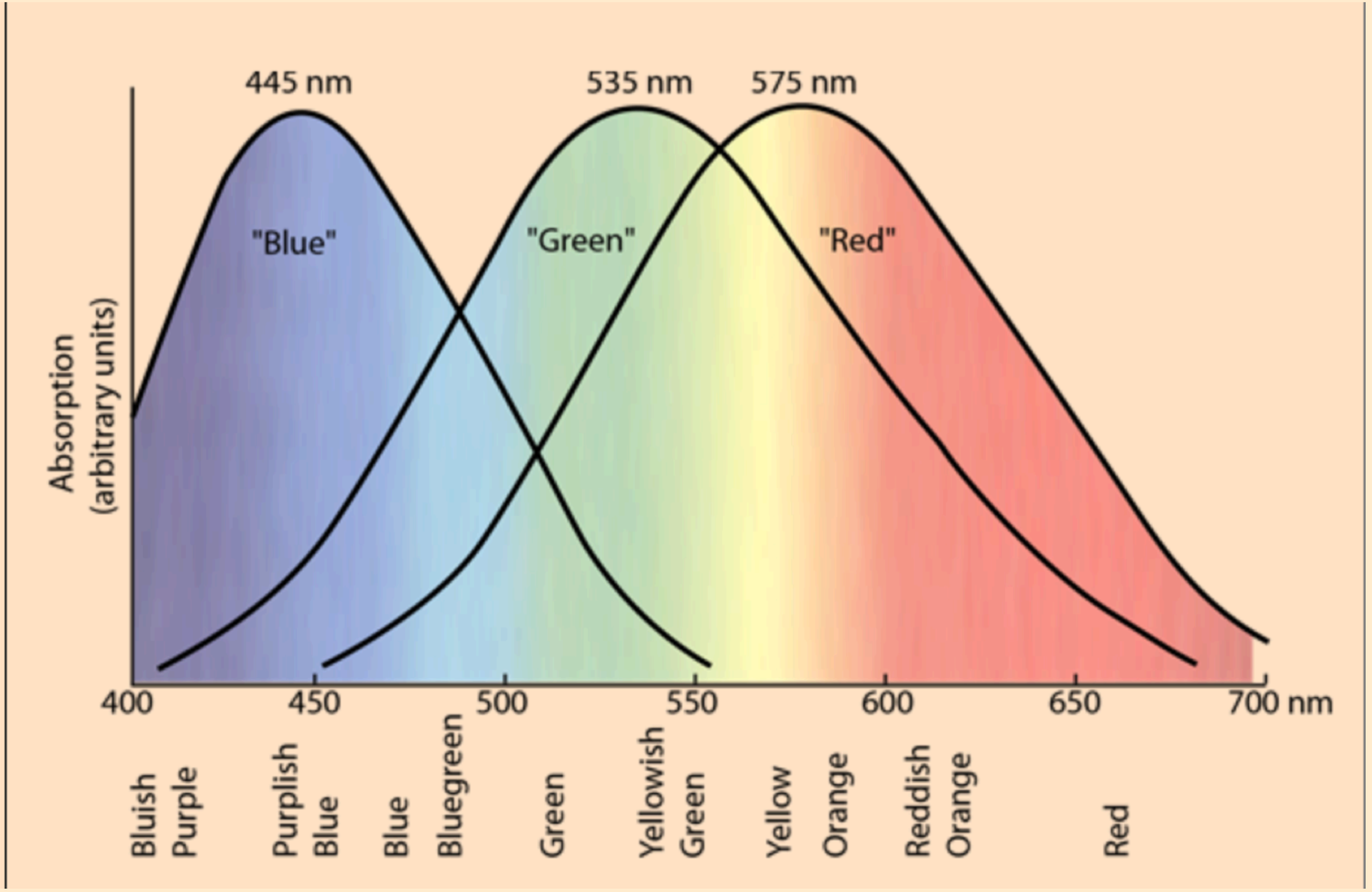


- Promote cellular and tissue regeneration
- 390-600 nm: Superficial treatments
- 808 nm: Regeneration occurred
- 600 nm allows regulation of cellular protein synthesis, nucleic acid synthesis, and cellular differentiation to promote growth factor release

Med Lasers 2022; 11(2): 78-83

Effects of low-level laser therapy on utricular hair cell regeneration: a review of the efficacy of available treatment parameters

HTTPS://WWW.JKSLMS.OR.KR/JOURNAL/VIEW.HTML?UID=277&VMD=FULL


445 nm
535 nm
575 nm
"Blue"
"Green"
"Red"
Absorption
(arbitrary units)
400
450
500
550
600
650
700 nm
Bluish Purple
Purplish Blue
Blue
Bluegreen
Green
Yellowish Green
Yellow
Orange
Reddish Orange
Red

Case 3: Vertigo

73 YO MALE

Type A personality

Onset after cataract surgery

MRI & CAT scans are all normal

Pykinic

Low metabolic rate

Myopic

Exophore

Hypertension

Hypothyroid

Asthenic

High metabolic rate

Hyperopia

Esophoria

Hypotension

Hyperthyroid

OBSERVATION

Case History

Differentiate

Duration of problem

Strabismus

Amblyopia

Headache

Depression

Uptight

Vertigo 73yo	Initial Visit	Final Visit
Visual Acuities	6 M OD: 20/20 OS: 20/20 40 cm OD: 20/20 OS: 20/20	6 M OD: 20/20 OS: 20/20 40 cm OD: 20/20 OS: 20/20
Entrance Skills	CT 6M EP 40cm IXT EM P:Full Slt loss S:over NPC TTN	CT 6M EP 40cm XP EM P:Full Smooth S:over NPC TTN
Subjective Refraction	OD +0.75 -1.25 x 135 OS -0.50 -1.75 x 095	OD +0.75 -0.75 x 135 OS -0.75 -1.00 x 095
Phorias & Ductions	6 M 2 EP 40 cm 14 XP. BO Sp/-6. BI18/18	6 M. ortho 40 cm 6 xp. BO 8/7. BI 22/20
Accommodation	NRA +1.50 PRA presbyope post cataract surgery	NRA +2.25 PRA. presbyope post cataract surgery
Final Rx	OD +0.75 -1.00 x 135. NL. +2.25 add OS -0.50 -1.25 x 095. NL. +2.25 add Bi-nasal occlusion	OD +0.75 -0.75 x 135. NL. +2.25 add OS -0.75 -1.00 x 095. NL. +2.25 add

ALPHA OMEGA PUPIL

High Level of Stress

Graded 3

Rebound

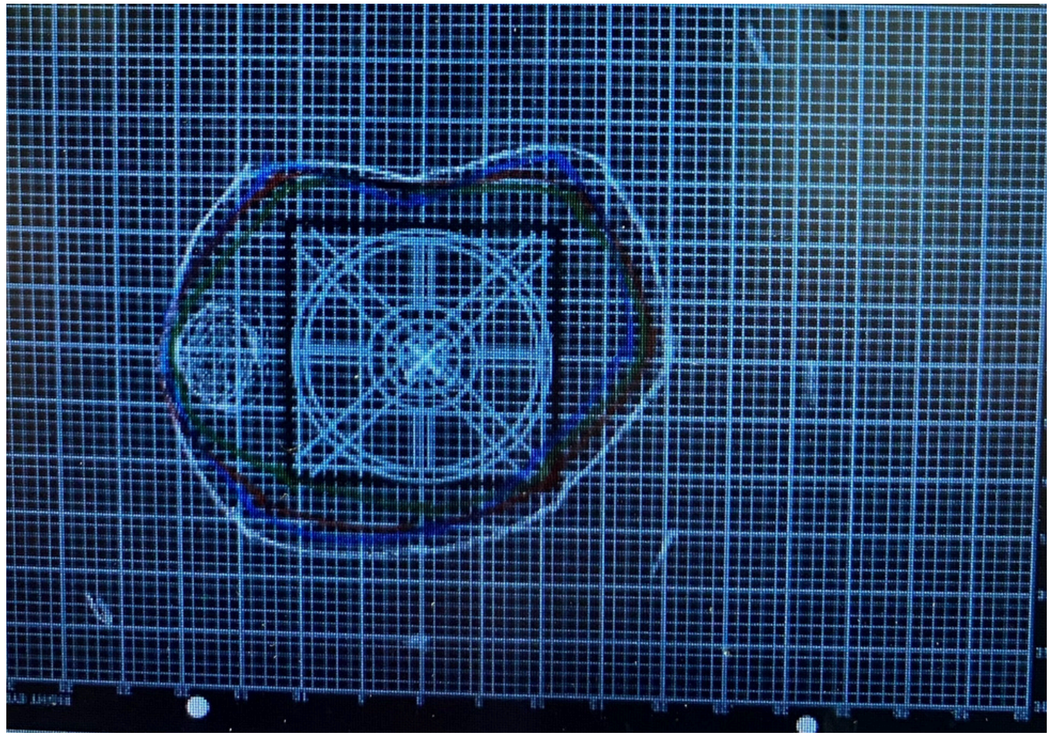
Average

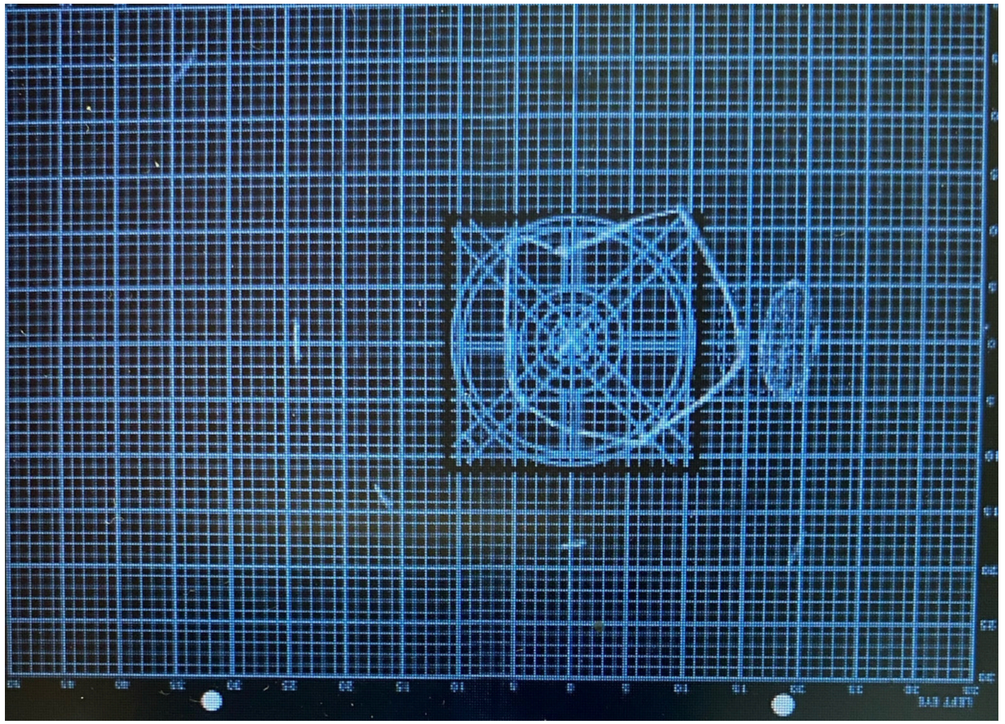
Ability to hold constriction

Average

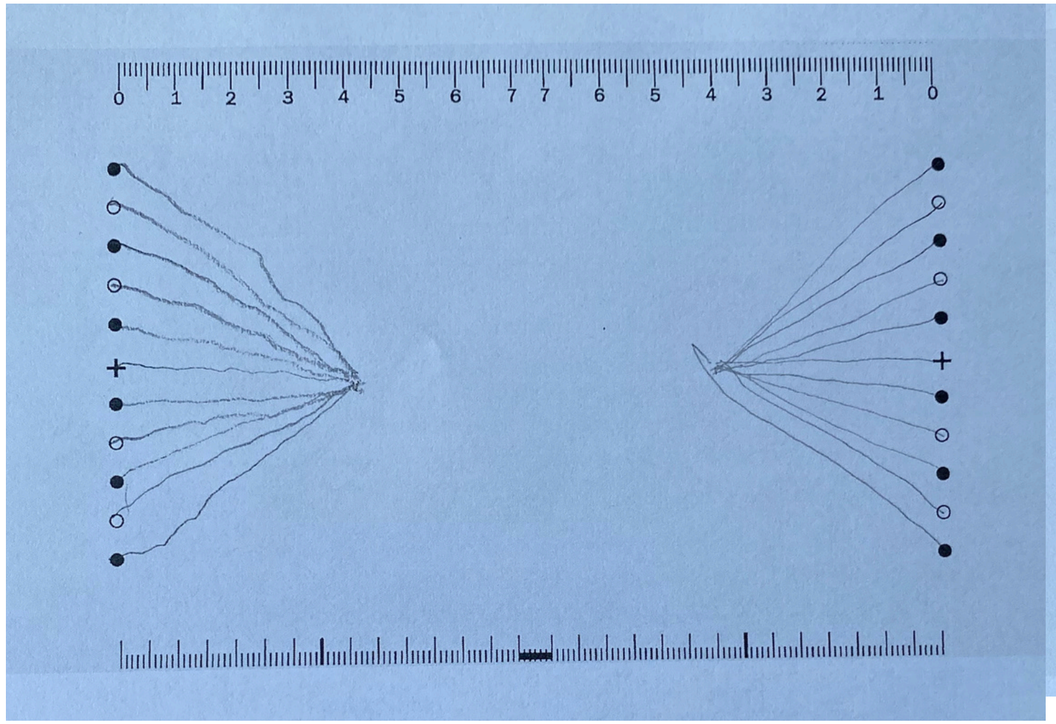
Vertigo: Fields

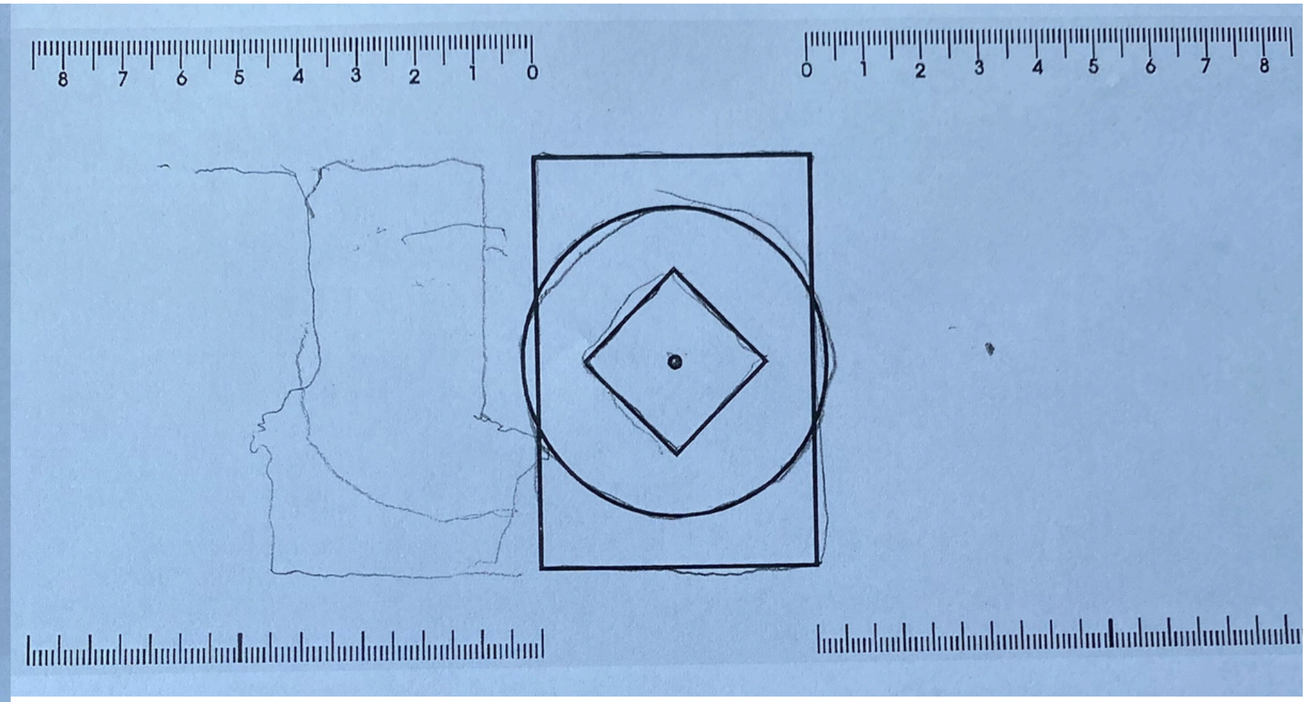
Omega D
MuDelta



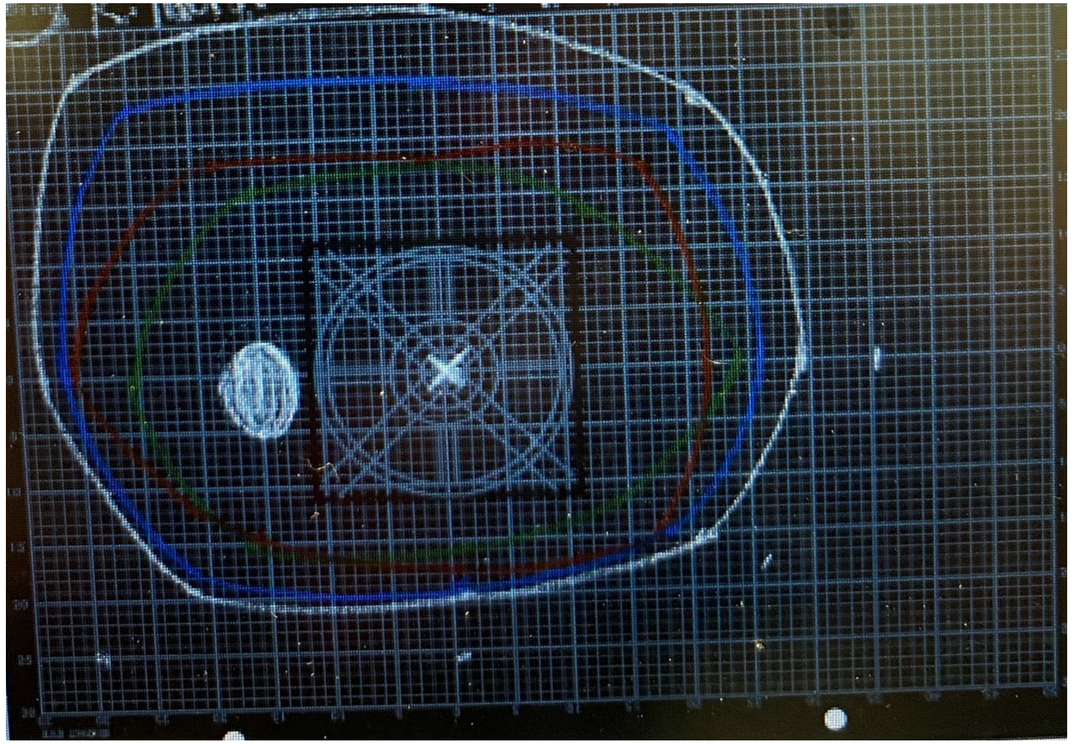


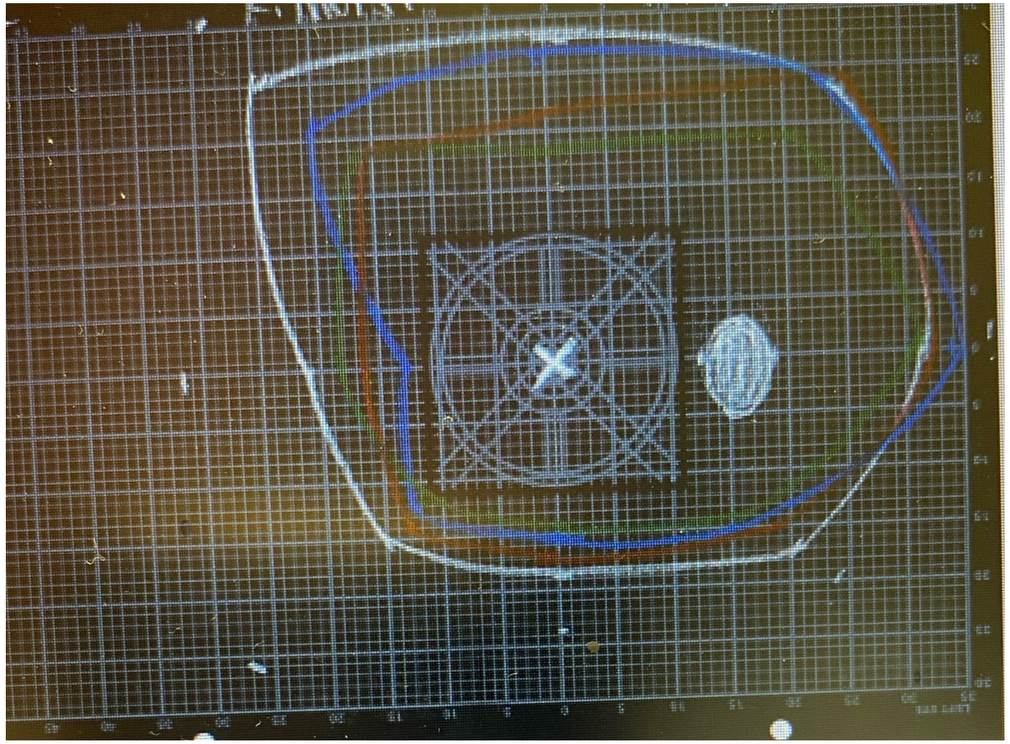
Vertigo: Tracings



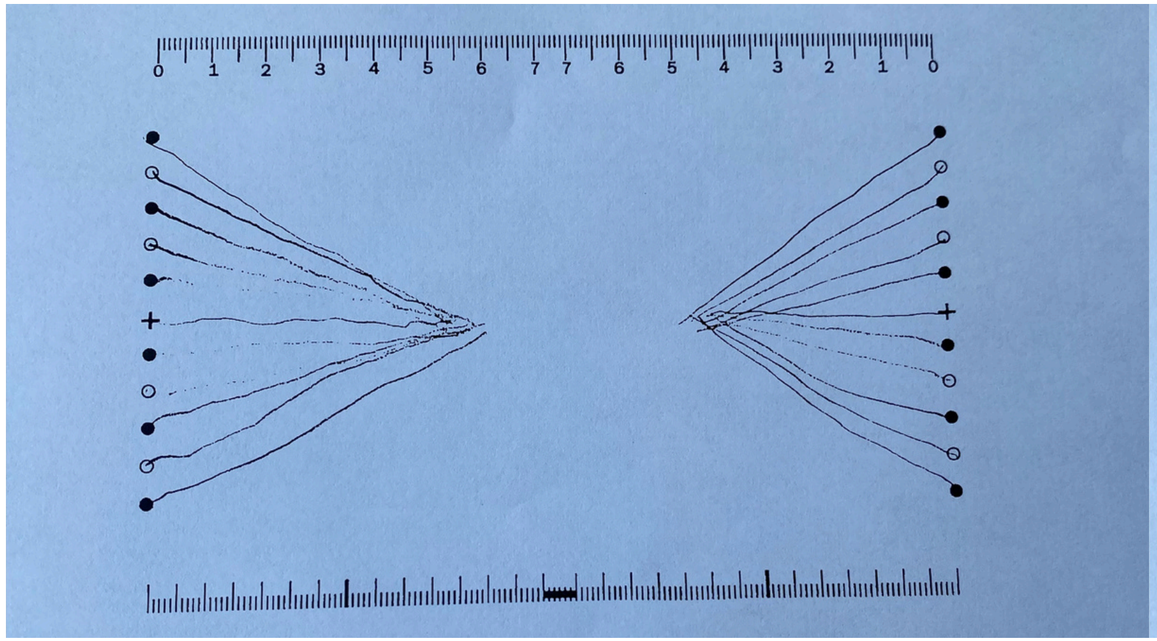


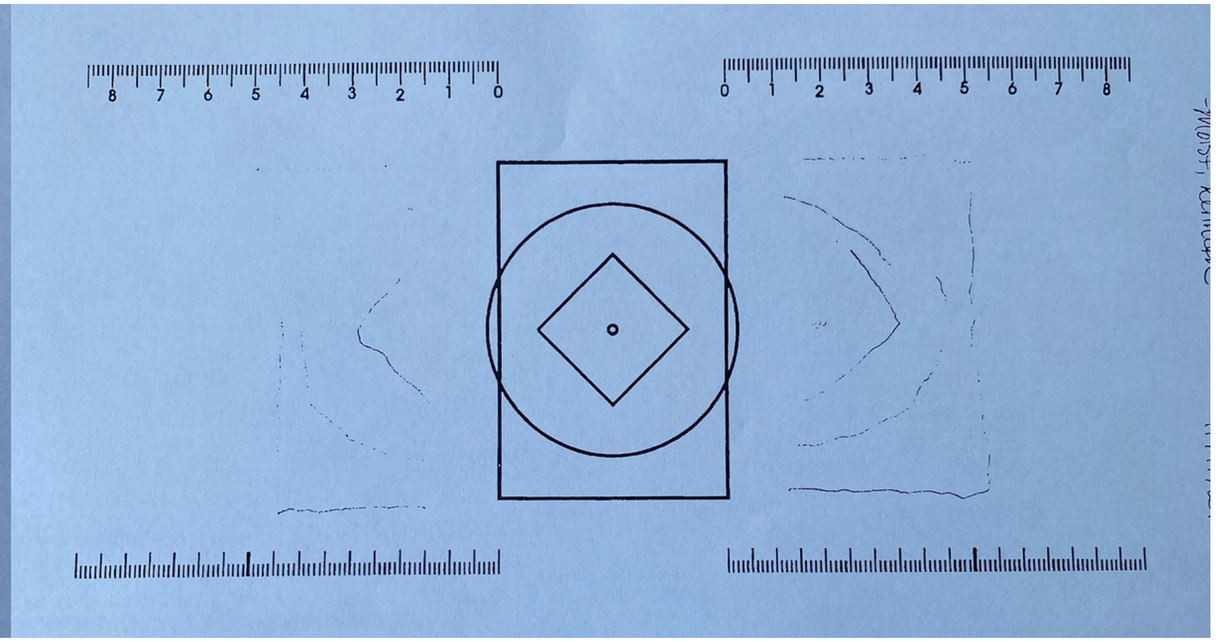
Vertigo: Fields Post Treatment





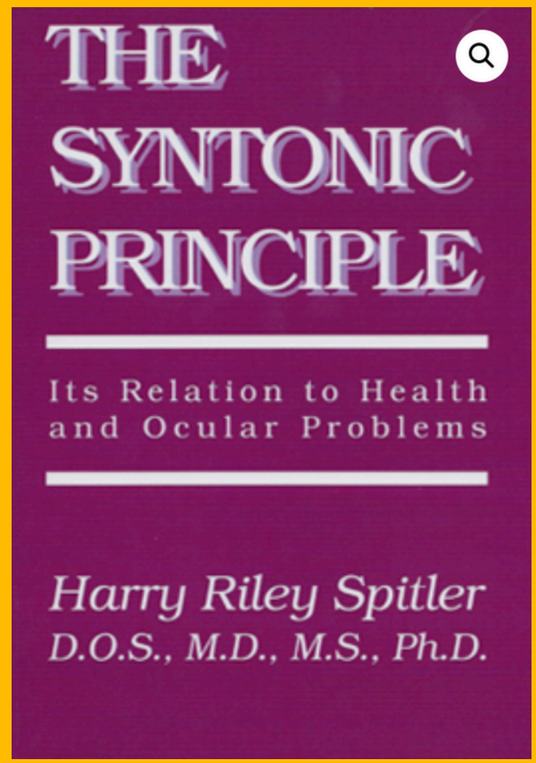
Vertigo: Tracings Post Treatment





"Body ailments are due to an imbalance in the autonomic nervous system."

H.R. Spitler



SYNTONICS

Phototherapy

SYNTONICS

Questions?

Thank you!

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