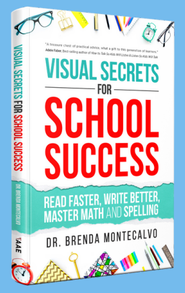
Cases:

- Myopia
- Vestibular

Brenda Montecalvo, OD, FCOVD, FAAO, FCSO

Disclaimer



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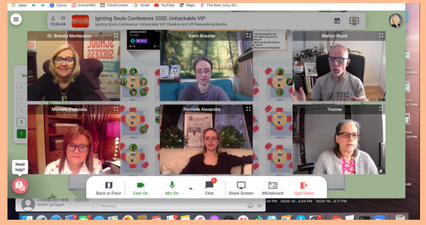


OPTOMETRIST

VOLUNTEER

Vision Leads Foundation

InfantSEE®

CSO College of Syntonic Optometry

SPEAKER

Epidemiology of Myopia

Today —— 22.9% Incidence Worldwide

Epidemiology of Myopia

By 2050

49.8% Incidence Worldwide

5 Billion People

1 Billion will have high myopia

Epidemiology of Myopia

According to the International Commission on Illumination and the Comité International des Poids et Mesures,

"The lighting environment of modern society can be extremely unnatural: We may be suffering from the hazard of arrhythmic blue light but also from violet light deprivation."

Light Influences Neurotransmitter

Light stimulates the release of dopamine in the retina.

Retinal dopamine is produced on a diurnal cycle. It tells the eye to switch from rod-based night vision to cone-based daytime vision.

Indoor Lighting

DISRUPTS THE CIRCADIAN RHYTHM, IMPORTANT FOR DOPAMINE RELEASE

Outdoor Lighting

STIMULATES THE CORRECT RELEASE OF DOPAMINE, IMPORTANT FOR REDUCING RISK OF MYOPIA

Myopia Case

13 YEAR OLD MALE STUDENT

Beginning signs of myopia

SUBJECTIVE

-0.25 DS

POSTURE

Esoposture

MYOPIA CASE

Positive for the following risk factors...

Living in an urban area

Urban versus Rural living
2.6 > chance of developing myopia

Genetics

Both parents have myopia

Greatest chance if both parents are myopic

Outdoor activity

Less than an hour a day

Less time outdoors. For every hour outside progression recedes by 2%

No outdoor sports

Extracurricular was Irish Dancing

Indooor activity

Academic

Increased reading time significantly

Years of education correlate to greater % of myopia.

Digital use

6 hours per day

Duration of digital device use

Working distance

Increased risk when holding books closer than Harmon's Distance

Reduced Working Distance

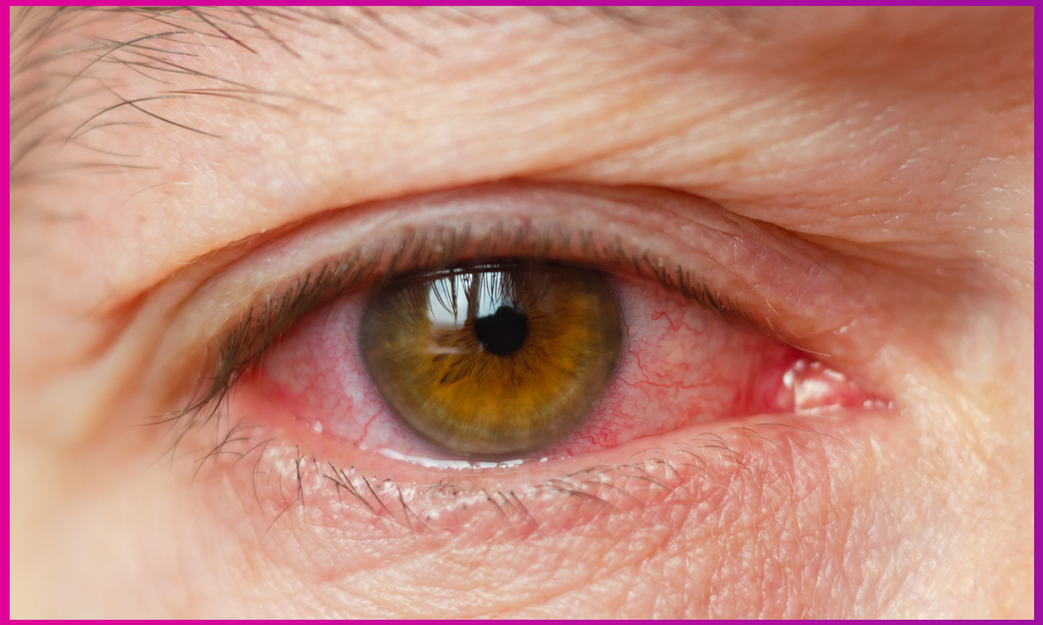
Time spent sleeping

Sleep was reduced to 6 hours a night

IOP

Slight increase

Dry eye



Mild bilateral dry eye

Randomized Trial

Effect of Repeated Low-Level Red-Light Therapy for Myopia Control in Children: A Multicenter Randomized Controlled Trial

Ophthalmology. 2022 May;129(5):509-519.
doi: 10.1016/j.ophtha.2021.11.023. Epub 2021 Dec 1.

Randomized Trial

Effect of Repeated Low-Level Red-Light Therapy for Myopia Control in Children: A Multicenter Randomized Controlled Trial

Significantly slowed axial length progression by 70%.

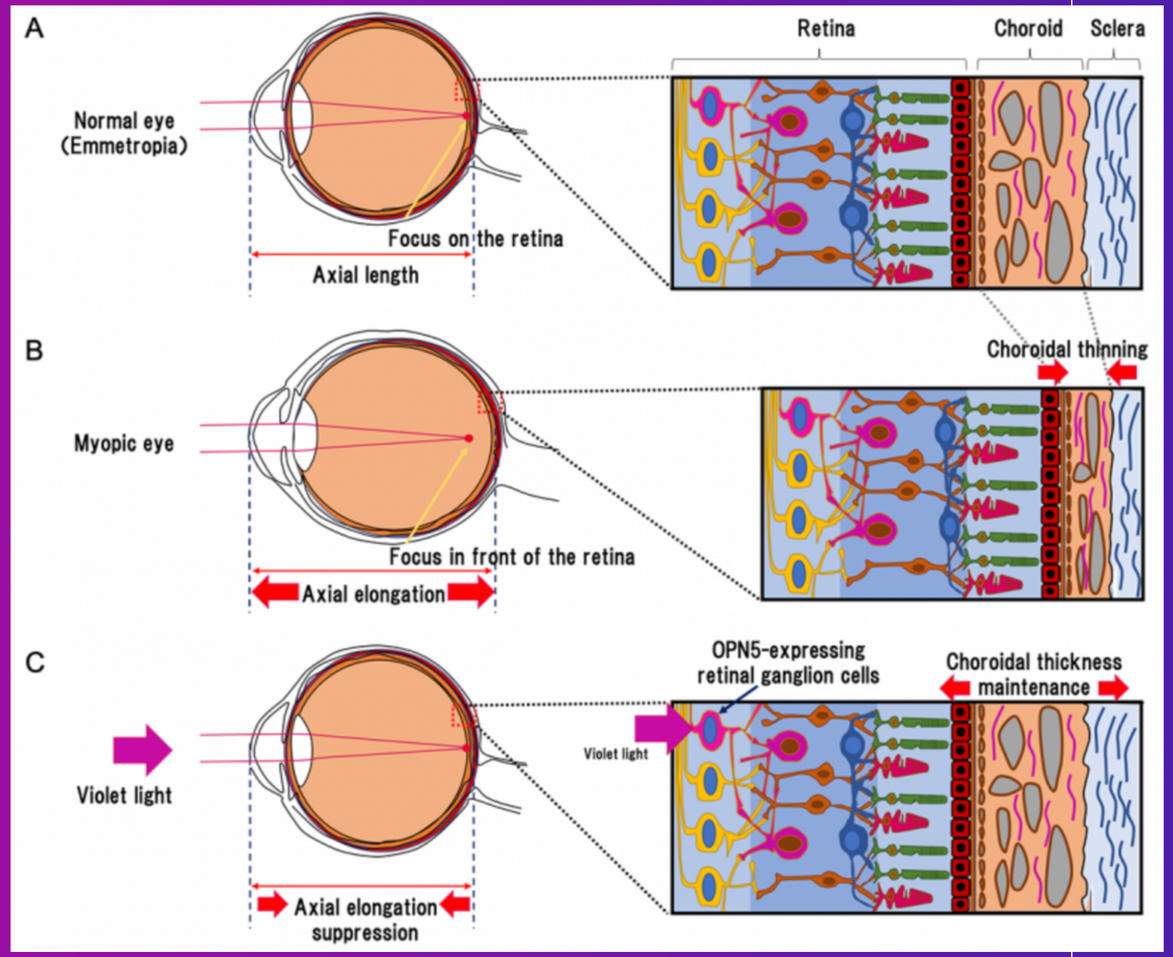
70% of participants experienced .05mm axial length shortening.

Violet Light

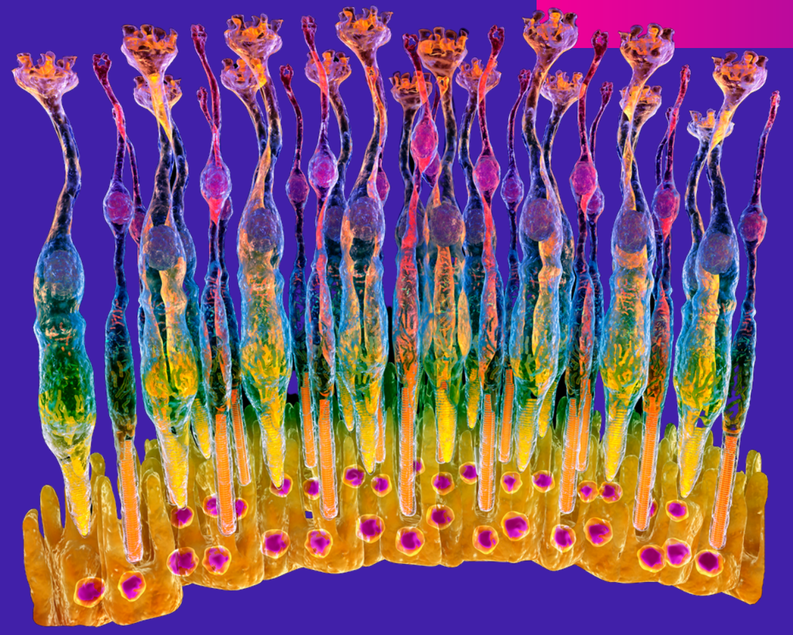
Violet light interacts with the photoreceptor protein OPN5 to prevent progression of myopia.

A. Normal eye.
B. Myopic eye with elongation between the cornea and the retina and thinning of the choroid.
C. Shows violet suppresses the elongation and thinning of the choroid.

(Illustration: Toshihide Kurihara)



Violet Light Transmission is Related to Myopia Progression in Adult High Myopia,
Hidemasa Torii, Nature 06 November 2017



Violet Light has a protective effect on myopia development in mice, chicks, and humans.

Ultraviolet (UV)-protective coating on windows blocks all light below 400 nm, almost no VL is emitted by artificial light sources.
It is hypothesized that the lack of VL in modern society is one reason for the myopia increase.

Violet Light has a protective effect on myopia development in mice, chicks, and humans.

- The absence of retinal Opn5 prevents thickening of the choroid.
- Opn5 retinal ganglion cell (RGC) plays a key role in emmetropization.
- The requirement for OPN5 also explains why VL has a protective effect on myopia development.

Study Compared the Wavelength Specificity of Violet Light to...

- Blue (440 to 480 nm)
- Green (500 to 540 nm)
- Red (610 to 650 nm)

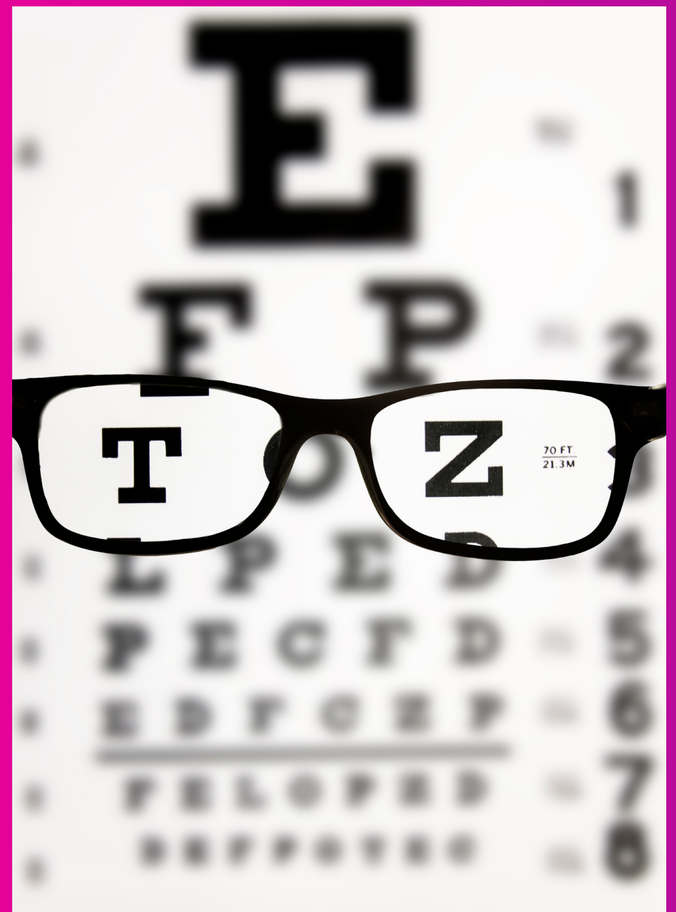
VL was shown to suppress myopia progression in both refraction and AL in mice.

- Neither red light nor green light produced any significant suppression refractive change or axial length
- Blue light produced a modest suppression of refractive change and a change in axial length
- VL produced the most robust response and significantly suppressed refractive and AL change compared with other wavelengths

VL was shown to suppress myopia progression in both refraction and AL in mice.

- Blue light is not suitable for preventing myopia since it stimulates intrinsically photosensitive RGCs (ipRGCs), causing unpredictable influences on the SCN circadian clock
- The VL source in the study was very narrow and emitted almost no light that would stimulate ipRGCs
- ipRCGs are unlikely to play an important role in VL–OPN5 pathway

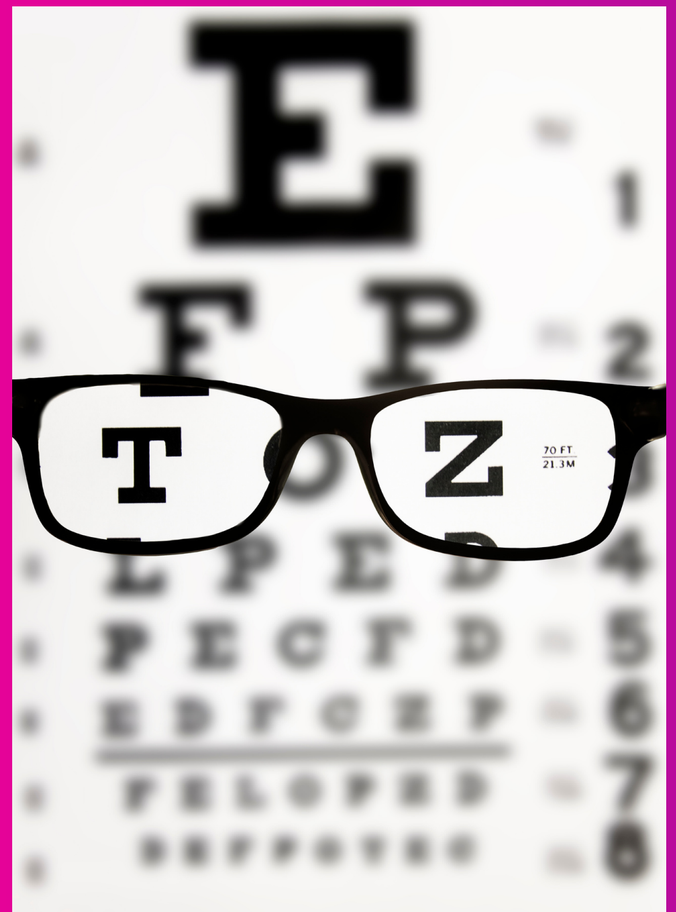
Case: Syntonogram
Vol. 18 No. 2 March-April 1955



17 yo needs 20/20 visual acuity to achieve a 4-year scholarship with the Naval Reserve Officer Corps.

Deadline was 4 months.

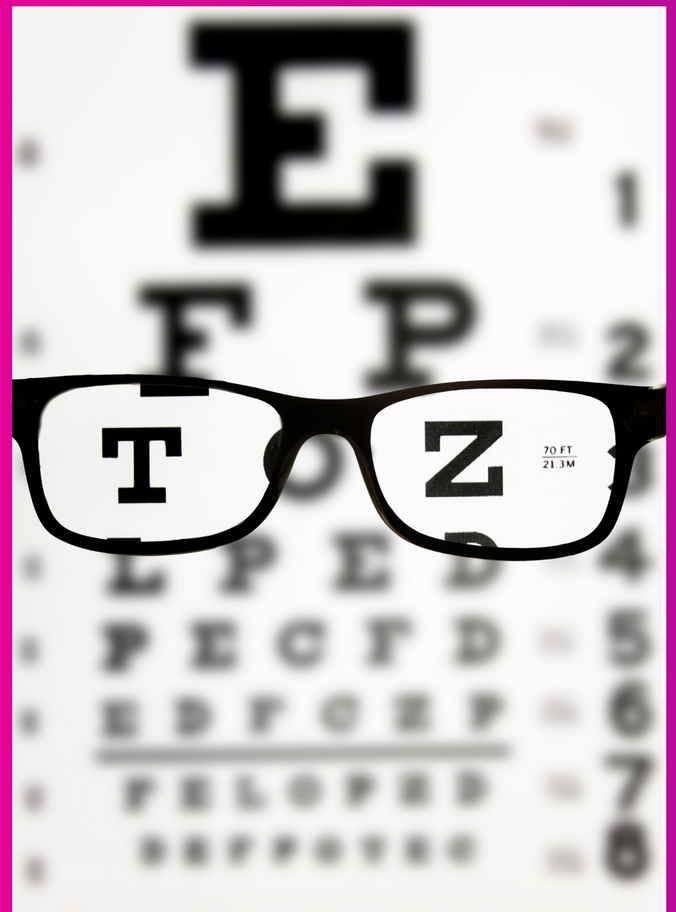
Case 1955



Rx +1.25 DS for near work
20 sessions of Syntonic applications.
All frequencies were flashed.

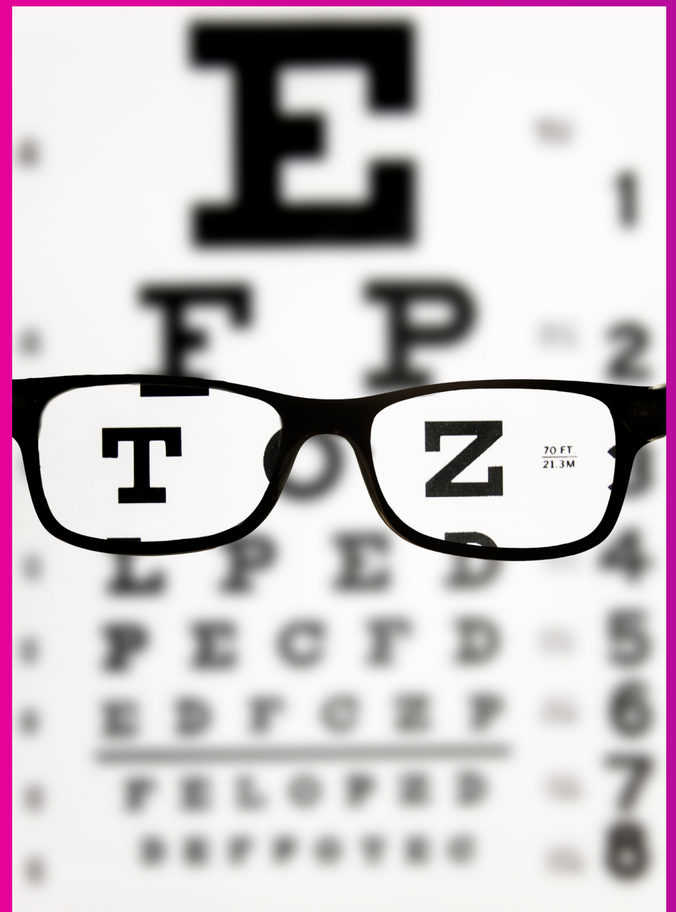
Achieved 20/20 in 2 months with each eye.

Case 1955



N/L 3,
Alpha Delta 5,
Mu Delta 5,
Alpha Theta S 8,
Mu Theta S
(last two frequencies on R. only)
Alternate with N/L 3, (flash all).

Case: Gabe
Early Myopic Shift

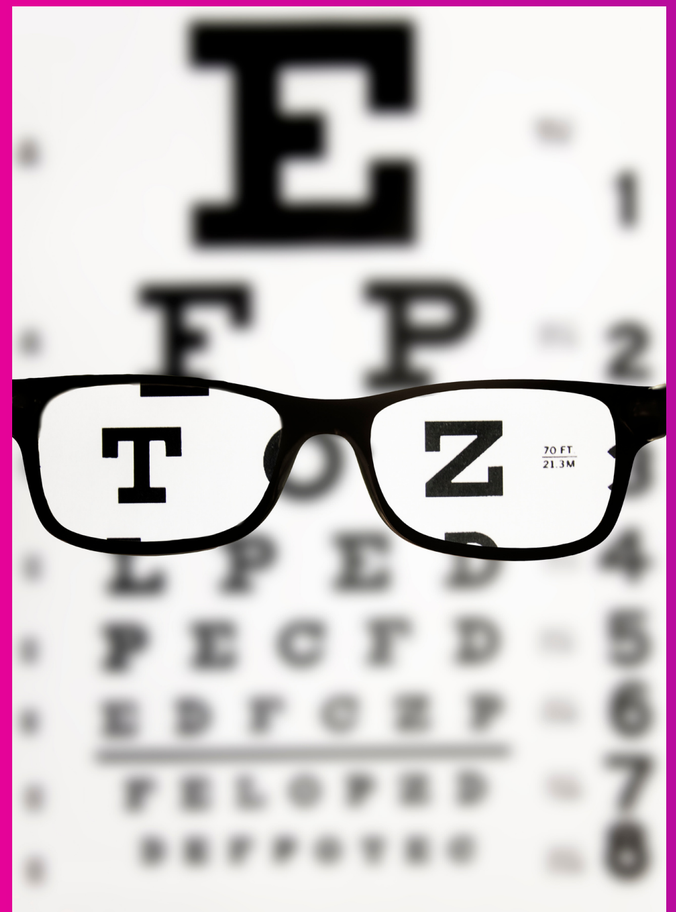


15 yo

Subjective: OD -0.50 DS, OS -0.25 DS

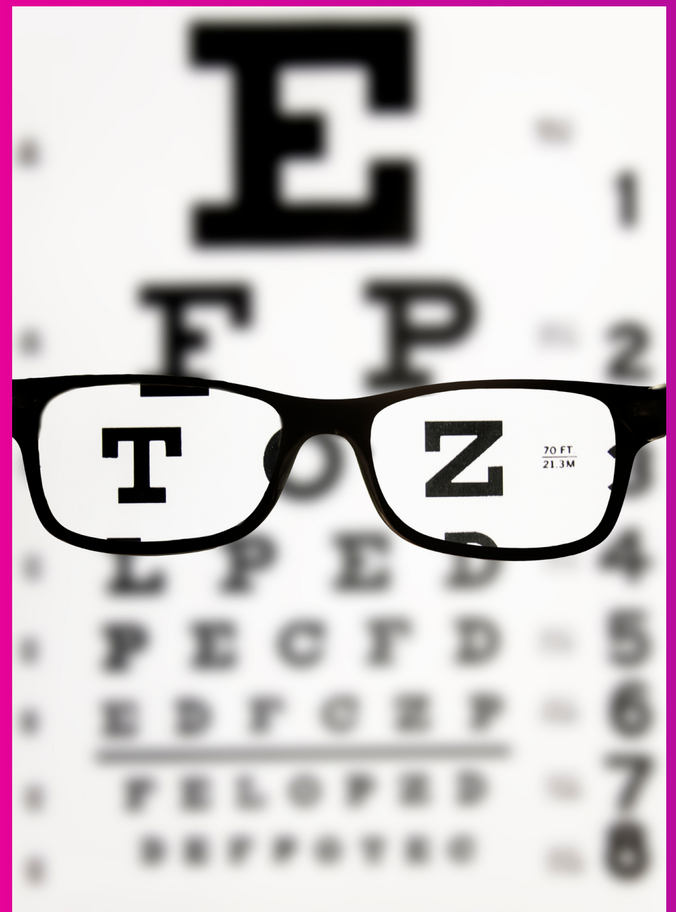
Esophoria

Case: Gabe
Early Myopic Shift



15 yo: 21 Sessions

Alpha/Delta for 10 min. in the morning and evening
Upsilon/Omega for 10 min. mid-day

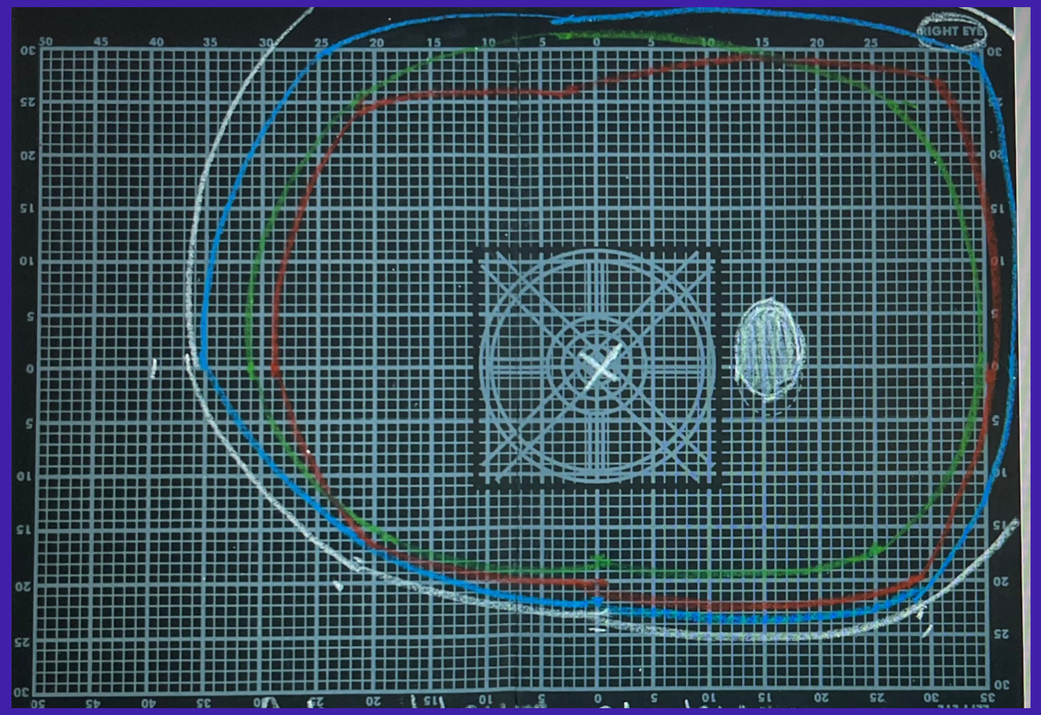


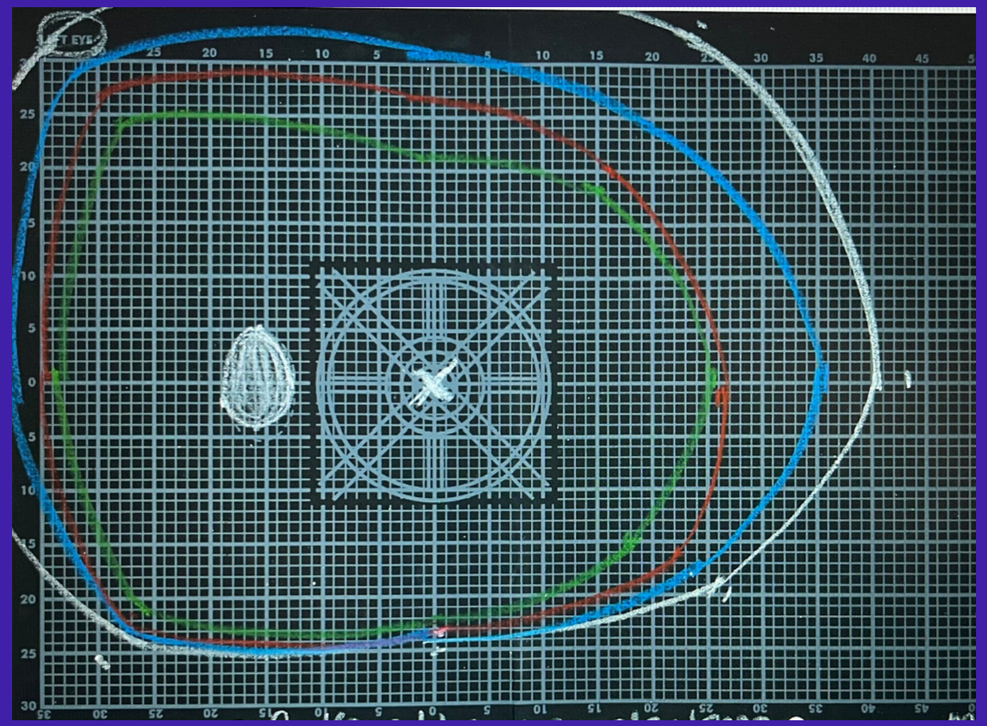
Case: Gabe
Early Myopic Shift

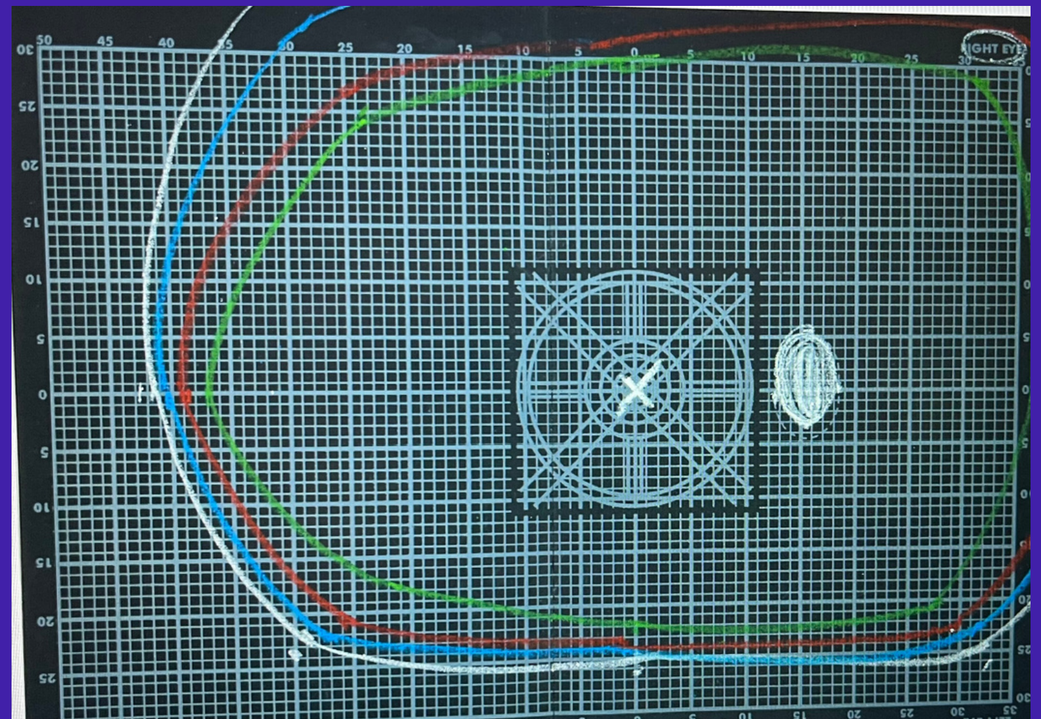
Progress Evaluation

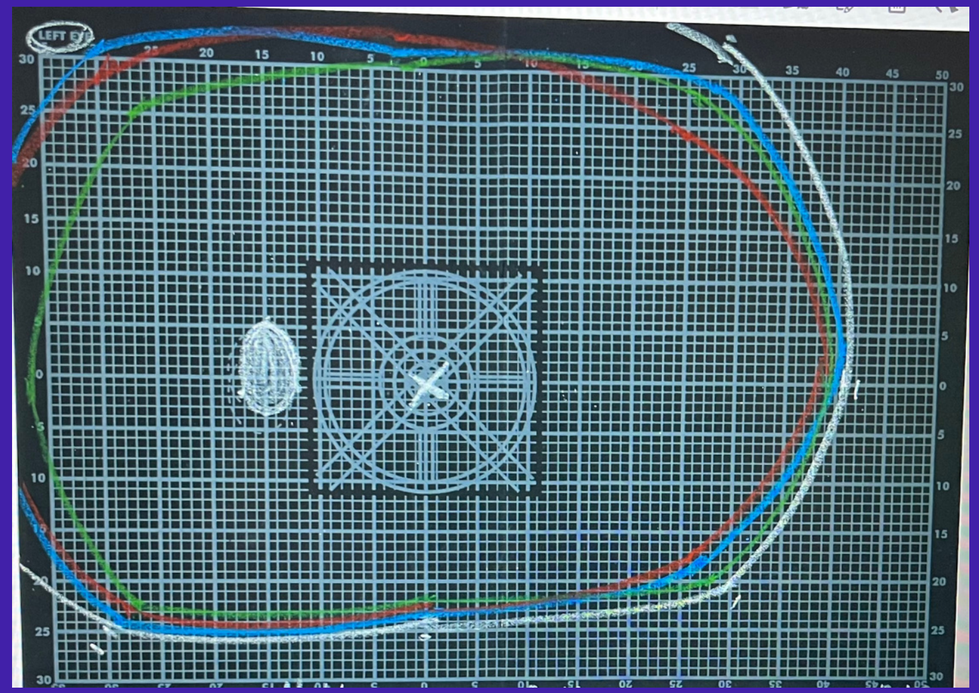
VA improved to
20/20- OD and 20/15 OS

Patient reported seeing better after doing each session, and this lasted for about an hour.









POTENTIAL PROTOCOL CONSIDERATIONS

- **Flicker/Pulsation**

  May simulate increase of intensity

- **Intensity**

  Brighter during mid-day
  Dim earlier or later in day

- **Time of Day**

  Red in the morning
  Violet use mid-day

- **Use Different Filters**

  Red: Alpha/Delta
  Blue: Upsilon/Omega D

The Visual Triad

Skeletal

Fixation

Seeks and Holds Images

Visceral

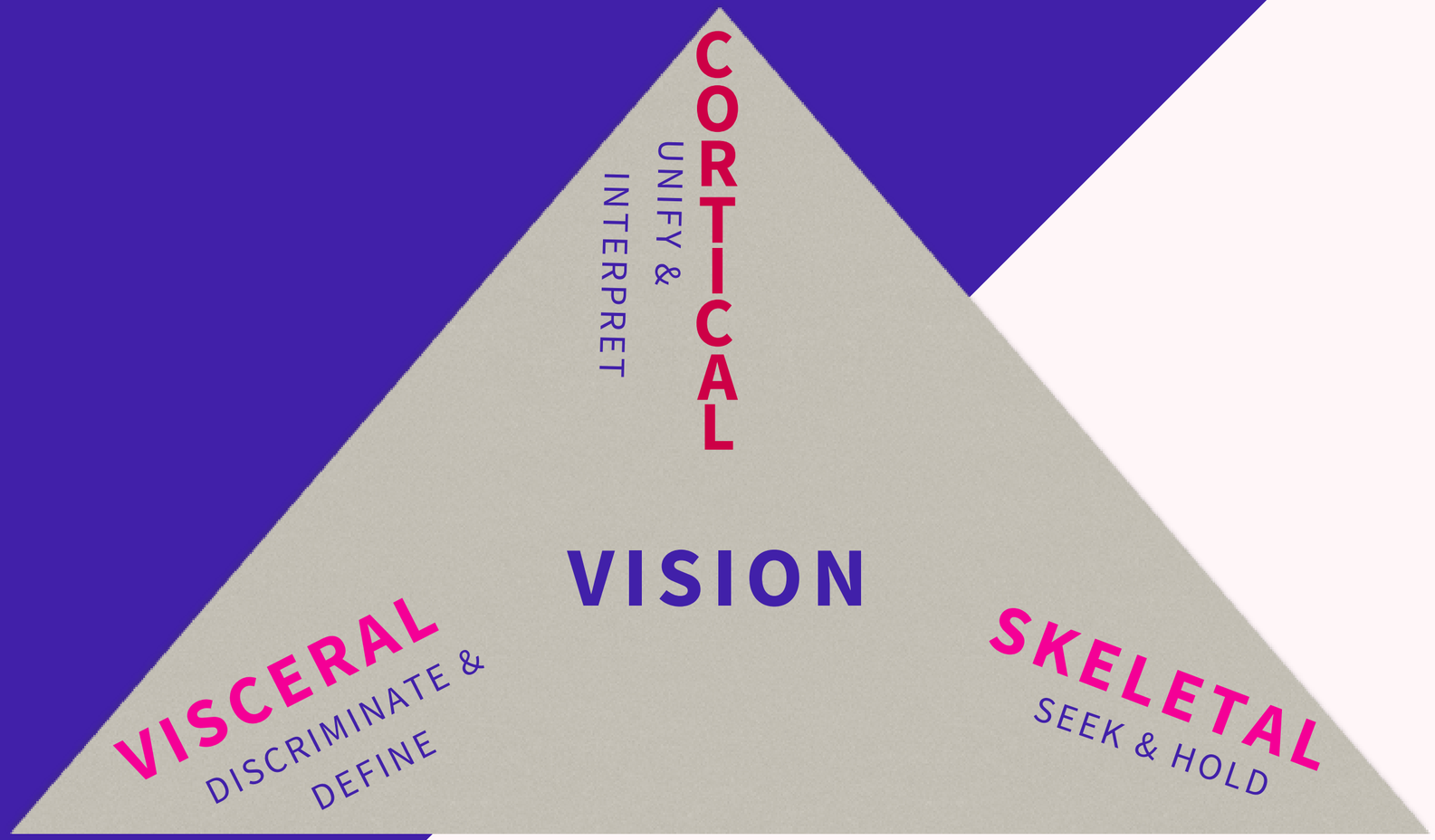
Focus

Discriminates & Defines Images

Cortical

Fusion

Unifies & Interprets Images



THE VISUAL TRIAD

ALL CONTRIBUTE TO VISION

They define
actuality, not reality

INCLUDE IMPORTANT EYE STRETCH ACTIVITY

- **Posture**

  Allows for improved visual movement

- **Breathing**

  Increases flow to peripheral retina

- **Lady Bug**

  Cortical increases stretch

- **Both Eyes Open**

  Occlude with hand

Vestibular Case

BRENDA MONTECALVO, OD, FCOVD, FAAO, FCSO

First Quarter Version

Epidemiology

AS MANY AS 35 PERCENT OF ADULTS OVER THE AGE OF 40 HAVE EXPERIENCED SOME FORM OF VESTIBULAR DYSFUNCTION AT SOME POINT IN THEIR LIVES.

Epidemiology

85 PERCENT OF DIZZINESS OR IMBALANCE SYMPTOMS ARE DUE TO VESTIBULAR DYSFUNCTION.

What Goes Wrong?

When the inner ear sends the wrong information or conflicting signals to the brain, dizziness can occur.

As a result, the natural response is to limit movement in order to minimize the rocking or spinning sensation.

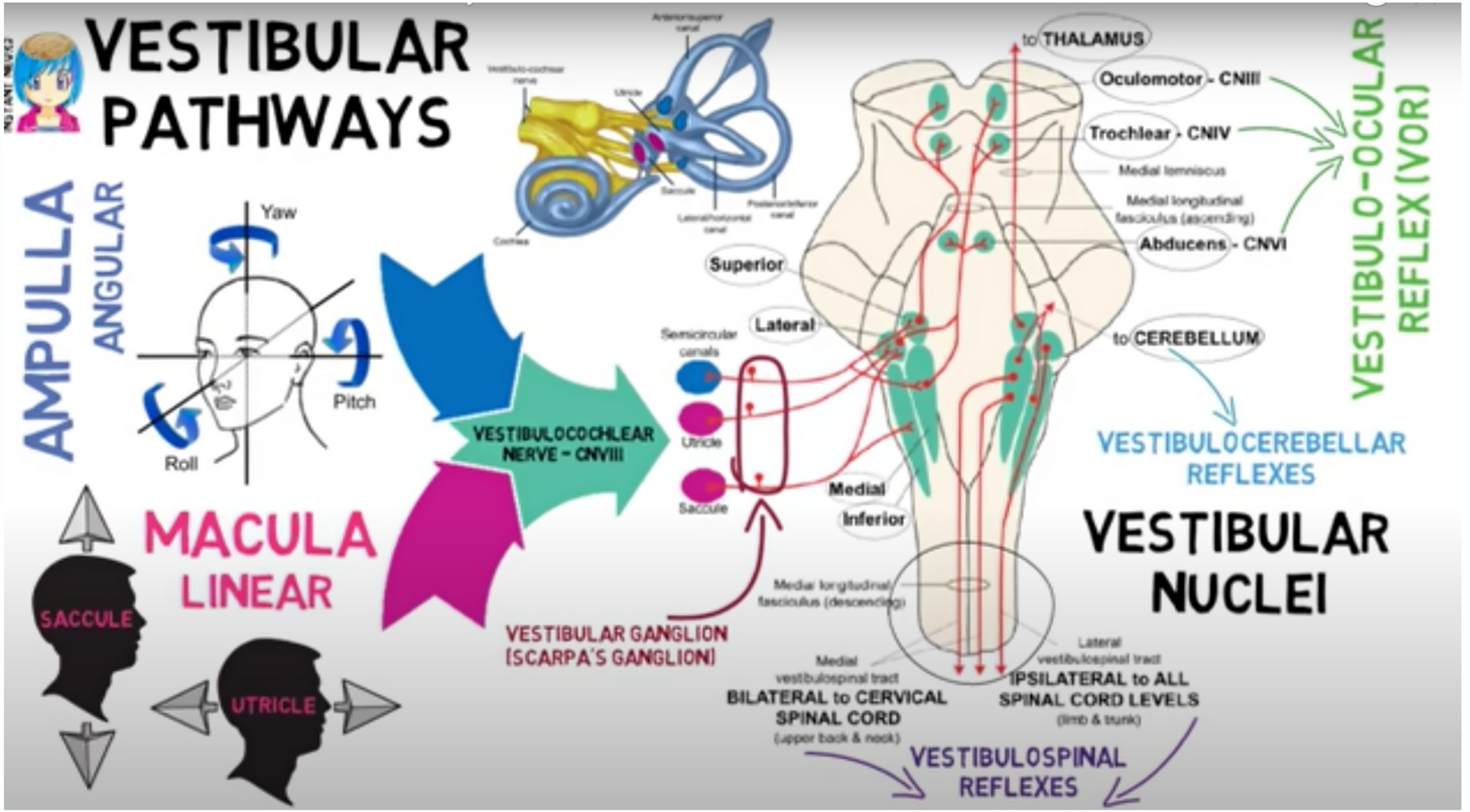
Causes?

Damage to the vestibular system by,

- Disease
- Viral infection
- High doses of antibiotics
- Stroke
- Degeneration of the inner ear’s balance function
- Blows to the head

Anatomy

**THE VESTIBULAR SYSTEM IS MADE UP OF
THE PERIPHERAL VESTIBULAR ORGAN (LOCATED IN THE INNER EAR),
VESTIBULOCOCHLEAR NERVE,
CENTRAL VESTIBULAR ORGAN, AND
NEURAL CONNECTIONS SITUATED IN THE BRAINSTEM.**



https://www.youtube.com/watch?v=cXhe20THed8

Common Symptoms

- Balance problems
- Dizziness
- Double vision
- Light sensitivity
- Low tolerance for visual stimuli
- Migraines
- Motion sickness
- Poor depth perception
- Vertigo

Common Symptoms

- Imbalance and spatial disorientation
- Cognitive and psychological changes
- Hearing changes
- Vision disturbance
- Lack of Concentration
- Memory loss
- Fatigue
- Difficulty getting out of bed
- Avoid grocery stores, traffic, shopping malls

Vestibular System Functions...

Detects the position and movement of our head and body in space.

Vestibular System Functions

Allows for the coordination of

- Eye movements
- Posture
- Equilibrium

Vestibular System Functions

Provides the sense of balance and the information about body position that allows rapid compensatory movements in response to both self-induced and externally-generated forces.

Vestibular System Functions

The vestibular system is what gives you your sense of balance and an awareness of your spatial orientation.

Vestibular System Functions

Allows for successful navigation of our physical world because of the integration of the three systems.

- Vestibular
- Visual
- Proprioceptive

Vision Connects to the Vestibular System

Ocular Motor Reflex

When you are moving through space, your brain knows that your body is moving – even if your eyes do not. This reflex helps keep you balanced and able to walk and coordinate your activities smoothly.

Vision Connects to the Vestibular System

The vestibular system consists of a complex coordination of central and peripheral systems that help keep you balanced.

This balance system uses sensory input from your eyes, muscles, joints and inner ear in order to consistently maintain your balance and stable vision.

Vision Connects to the Vestibular System

The vestibular system can be divided into two main systems:
the central system (the brain and brainstem)
and the peripheral system (the inner ear and the pathways to the brainstem).

Vestibular System

Controlled by various parts of the inner ear
Gives the brain information about movement

This can be in the
linear (straight ahead) direction,
side to side, or the
rotational direction.

Vestibular System

Our inner ears also give the brain information about the force of gravity.

CASE

HISTORY

Refer for vestibular problems

TREATMENT

Syntonics

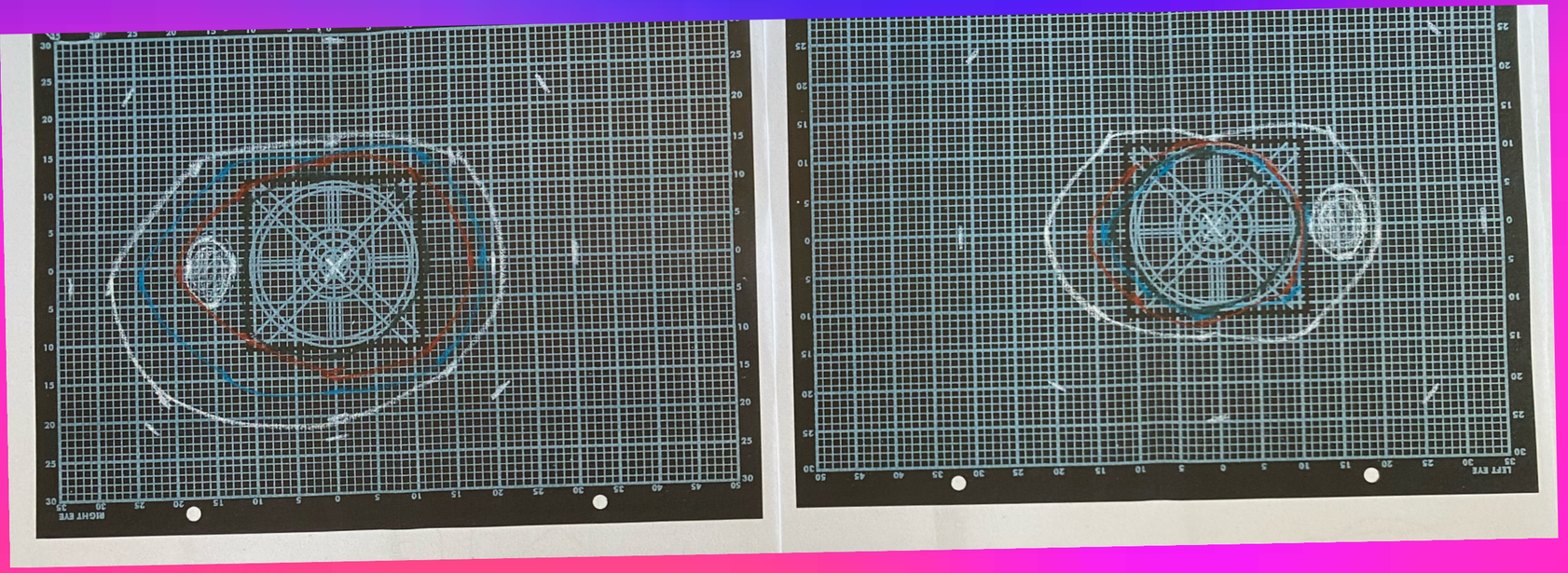
FINDINGS

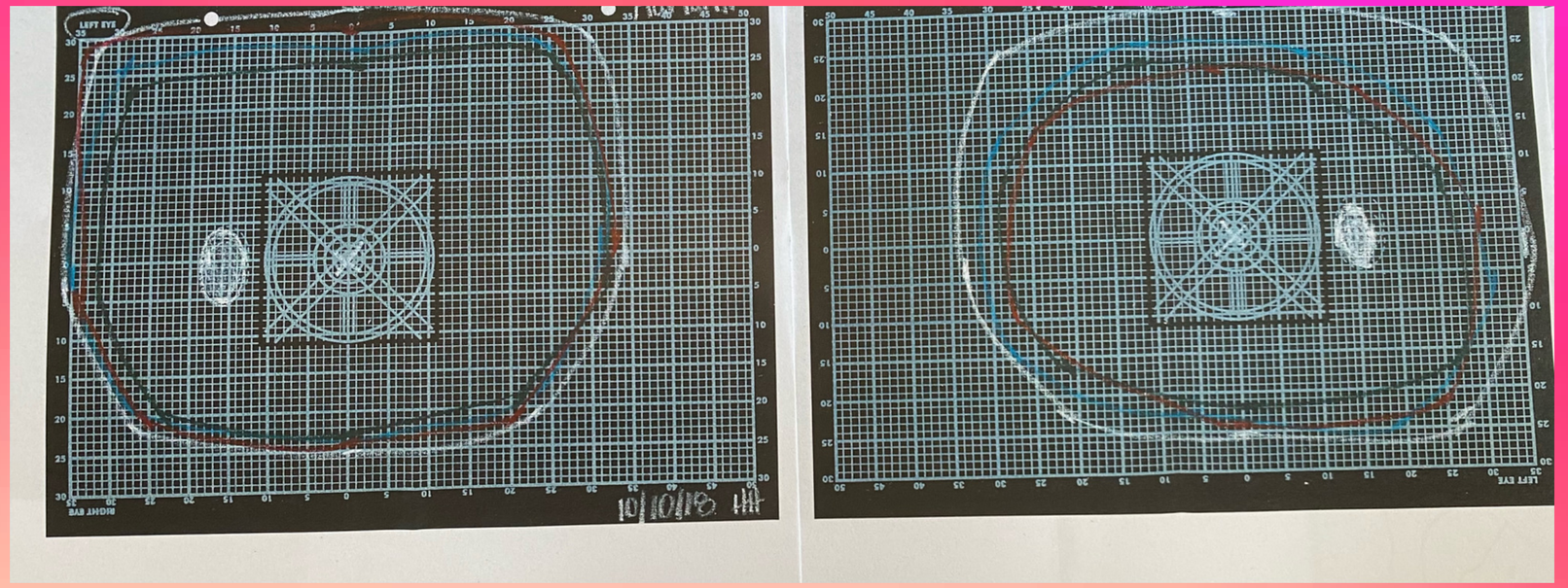
Assessment

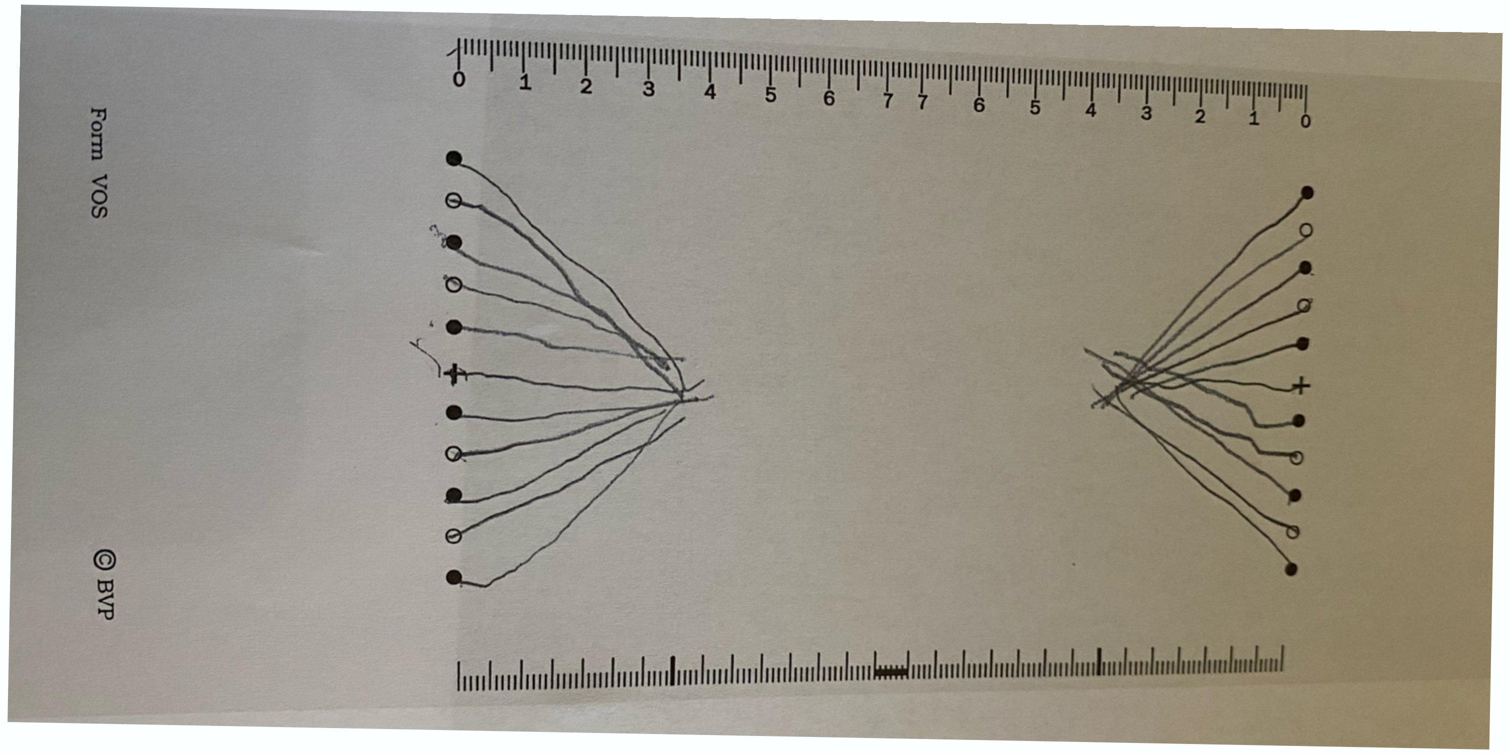
RESULTS

reduced symptoms

FIELDS



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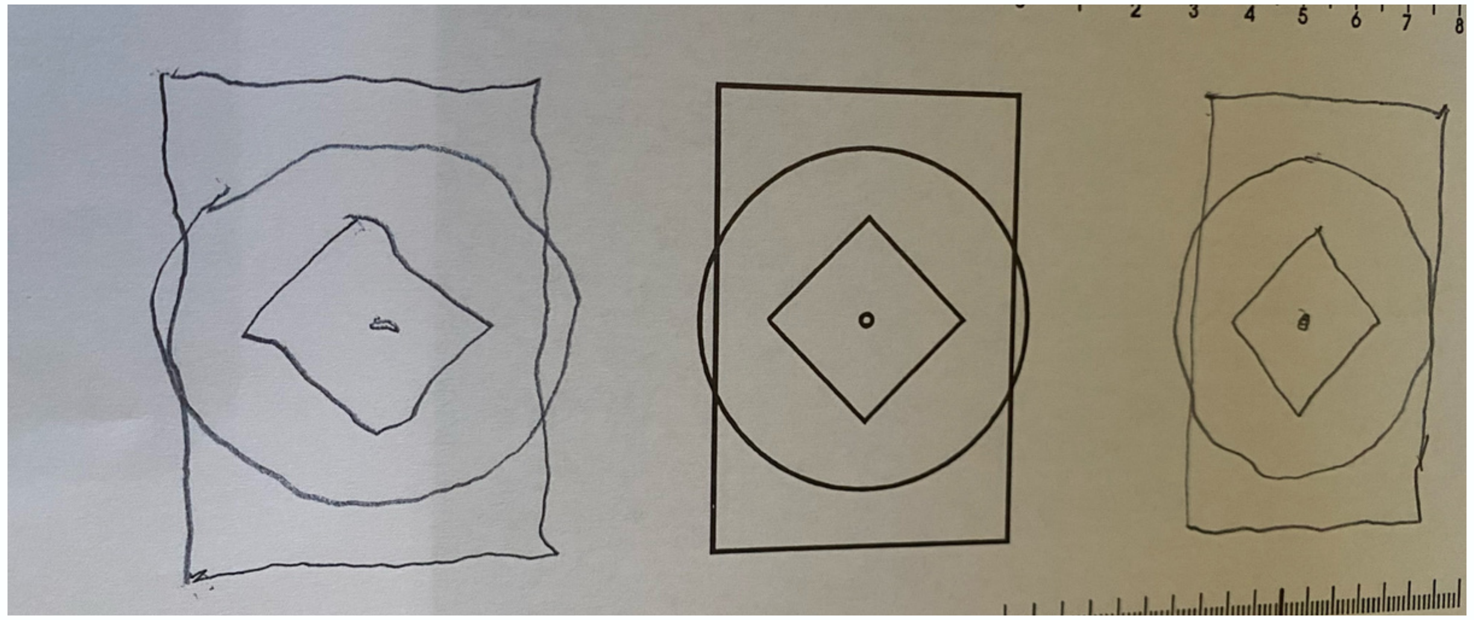

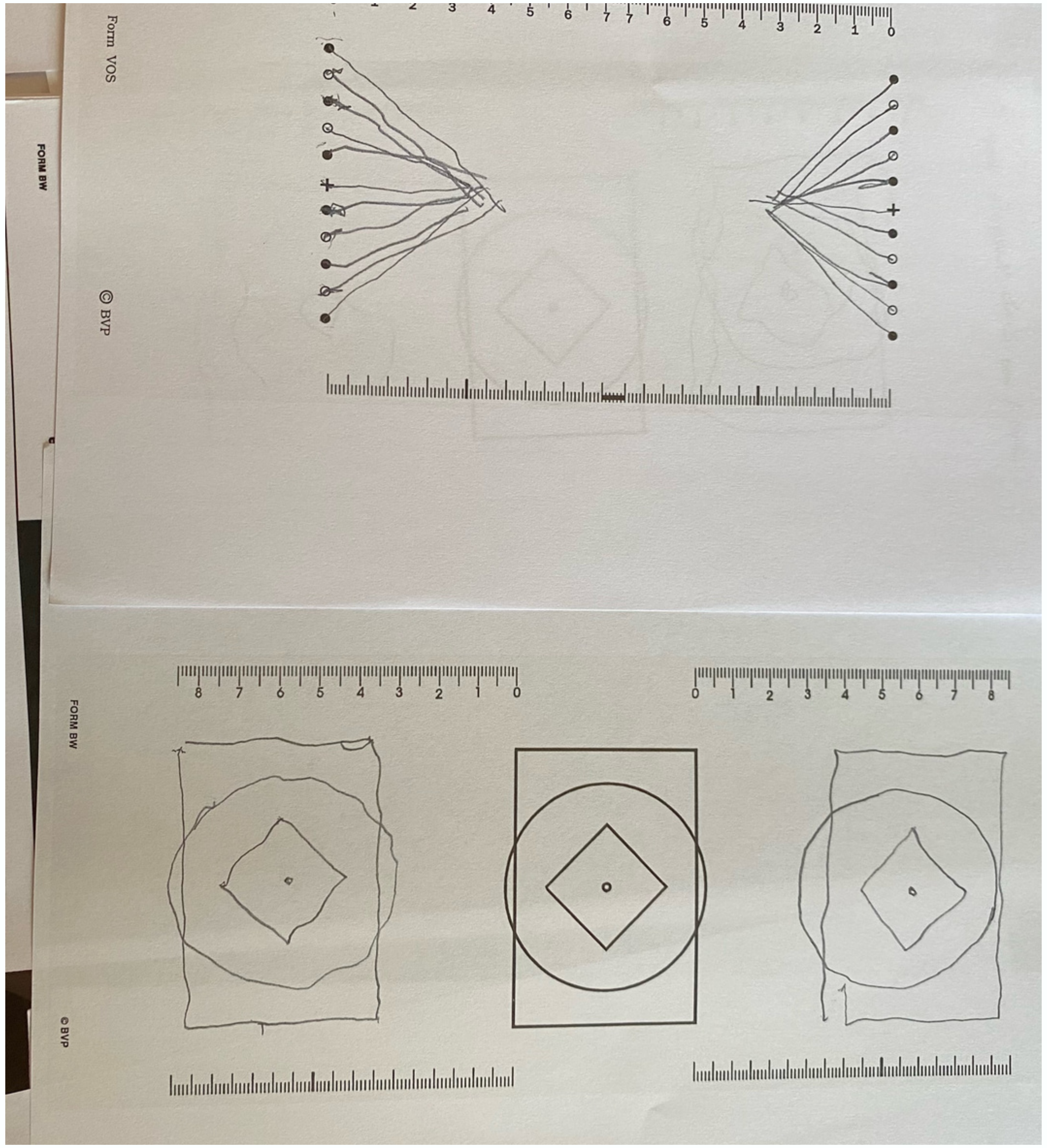
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Thank You

“Give light and people will find the way.”

Ella Baker

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