



NEURO
INSTITUTE

Continuing Education for Rehabilitation Professionals



Adjunct Therapy for TBI, Neck Pain, Gait/Balance Disturbances and Falls in the Elderly:

Microprism Lenses and Sound Attenuation

Debby Feinberg, OD, FAAO

Mark Rosner, MD, FACEP, FAAO

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Vision Specialists of Michigan

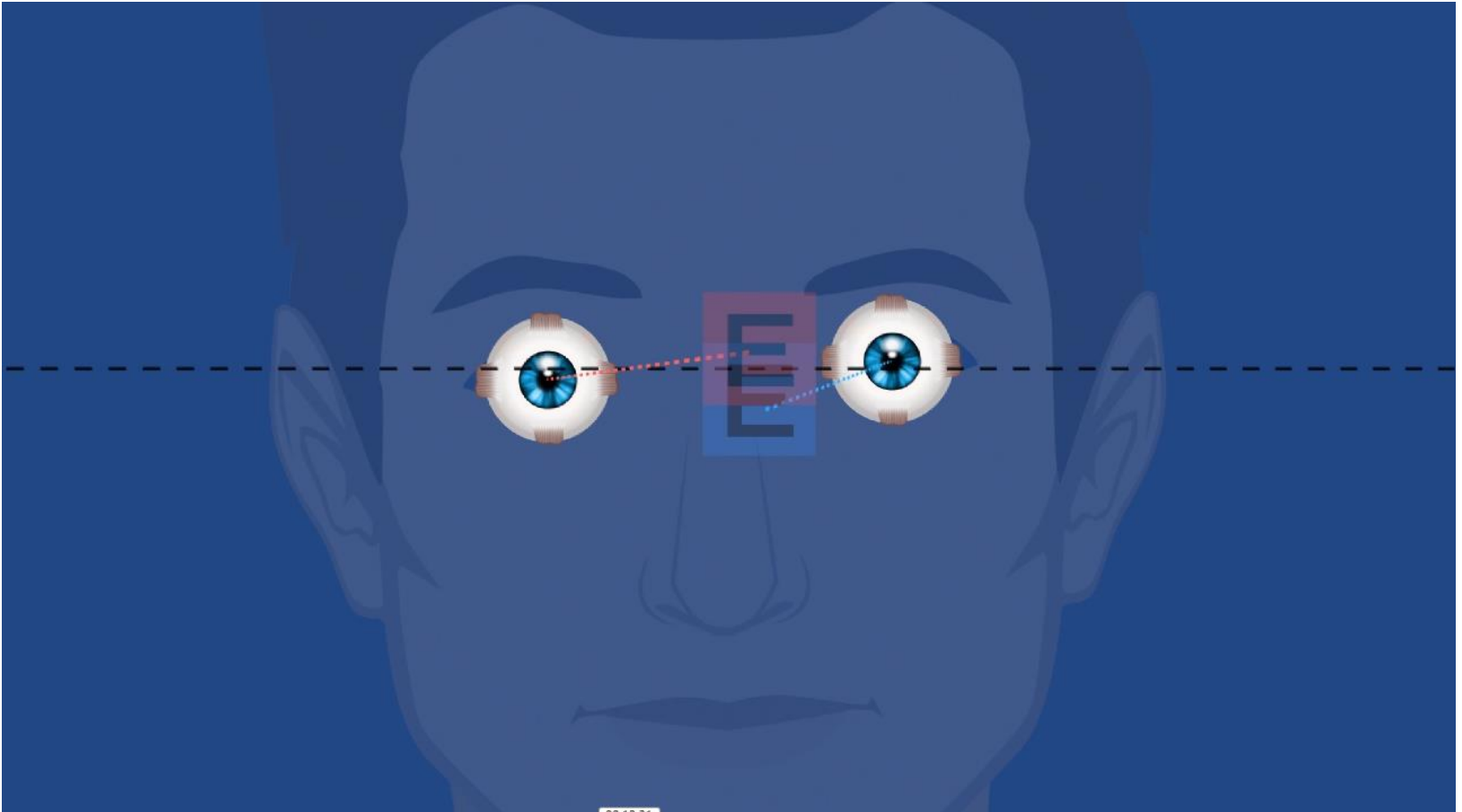
The logo for Vision Specialists of Michigan features a stylized 'VS' monogram. The 'V' is dark blue with a small leaf-like shape at its top. The 'S' is light blue and curves around the 'V'. A brown swoosh is positioned below the 'S'.

Binocular Vision Dysfunction

Eyes not working together in a coordinated fashion

Vertical Heterophoria

Line of sight from one eye is above/below line of sight from the other eye when fusion is disrupted



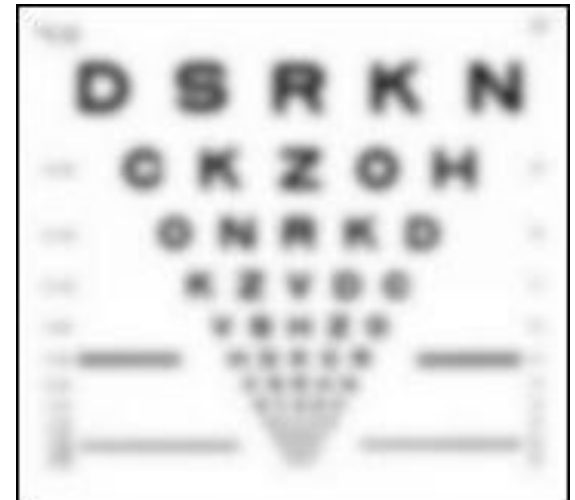
Symptoms













Prior Diagnoses:

Vestibular

Meniere's or Atypical Meniere's

Migraine Associated Vertigo
(MAV) / Vestibular Migraine

Labrynthitis

Vestibular Neuronitis

Benign Paroxysmal Positional
Vertigo (BPPV)

Chiari Malformation

Persistent Positional Perceptual
Dizziness (PPPD)**

Chronic Subjective Dizziness**

Psychogenic Dizziness**

Vestibular

Meniere's or Atypical Meniere's

Migraine Associated Vertigo (MAV) / Vestibular Migraine

Labrynthitis

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Benign Paroxysmal Positional Vertigo (BPPV)

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Pain

Migraines / Vestibular Migraine

Muscle tension headaches

Sinusitis

Chronic neck pain / Torticollis

Vestibular

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Pain

Migraines / Vestibular Migraine

Muscle tension headaches

Sinusitis

Chronic neck pain / Torticollis

Reading and Learning

Reading/Learning Difficulty

Dyslexia

ADD/ADHD**

Vestibular

Meniere's or Atypical Meniere's

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Reading and Learning

Reading/Learning Difficulty

Dyslexia

ADD/ADHD**

Binocular Vision

EOM weakness

CN weakness

Convergence Insufficiency

Psychiatric

Generalized Anxiety Disorders

Panic Attacks

Agoraphobia

**Persistent Positional Perceptual
Dizziness (PPPD)

**Chronic Subjective Dizziness

**Psychogenic Dizziness

**ADD/ADHD

MALINGERING –

“Just making it up”

“It’s not real”

“It’s all in your head”

Psychiatric

Generalized Anxiety Disorders

Panic Attacks

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**Persistent Positional Perceptual
Dizziness (PPPD)

**Chronic Subjective Dizziness

**Psychogenic Dizziness

**ADD/ADHD

MALINGERING –

“Just making it up”

“It's not real”

“It's all in your head”

Traumatic Brain Injury

TBI with persistent post
concussive symptoms (TBI with
PPCS)

Can be a cause of symptoms in
all the previous categories

| How Uncomfortable Are They?



- Vertical Heterophoria Simulator





|



Factors That Trigger / Worsen VH Symptoms

- "Vestibular" stimulation:
 - Vertical and horizontal head motion
 - Bending down and coming back up quickly
- Looking from near to far distances
- Visual stimuli :
 - reading
 - action movies
 - 3D movies
 - certain wallpaper or carpet patterns
 - driving on freeways
 - **(all forms of optokinetic stimuli)**

Factors That Trigger / Worsen VH Symptoms

- Complex visual environments like malls, grocery stores, crowded rooms
- Significantly different Rx between eyes, monovision CL's
- Traumatic Brain Injury
- Intense near-point work (computers, reading)
- Errors in prescription lenses
- Surgery: Cataract, Lasik, Eyelid (tightening), Retinal reattachment, monovision implants

Causes of VH



Recurrent Theme For These Patients



- Symptoms not recognized as being syndromic for VH
- Symptomatic for a long time
- Seen by many different care providers
- Many tests performed (including CT, MRI, audiogram, ENG, EEG, Holter)
- Many medications /therapies tried
- Many procedures performed

Never Improved



Symptoms aren't recognized as being due to a binocular vision problem



| How Do We Screen For VH?



- BVDQ
- 5 Minute Cover Test
- NPD

SCREENING QUESTIONNAIRE

Binocular Vision Dysfunction / Vertical Heterophoria

For Ages 14 & Older

Name _____ Date _____
Phone Number _____ Email _____

Directions: For each of the following questions, please check the answer that best describes your situation. If you wear glasses or contact lenses, answer the questions assuming that you are wearing them.

Always = every day

Frequently = at least once per week

Occasionally = less than once per week

Never = never

ALWAYS
FREQUENTLY
OCCASIONALLY
NEVER

1	Do you have headaches and/or facial pain?				
2	Do you have pain in your eyes with eye movement?				
3	Do you experience neck or shoulder discomfort?				
4	Do you have dizziness and/or light headedness?				
5	Do you experience dizziness, light headedness, or nausea while performing close-up activities (computer work, reading, writing, etc.)?				
6	Do you experience dizziness, light headedness or nausea while performing far-distance activities (driving, television, movies, etc.)?				
7	Do you experience dizziness, light headedness, or nausea when bending down and standing back up, or when getting up quickly from a seated position?				
8	Do you feel unsteady or drift to one side while walking?				
9	Do you feel overwhelmed or anxious while walking in a large department store (Target, Wal-Mart, Costco, etc.)?				
10	Do you feel overwhelmed or anxious when in a crowd?				
11	Does riding in a car make you feel dizzy or uncomfortable?				
12	Do you experience anxiety or nervousness because of your dizziness?				
13	Do you ever find yourself with your head tilted to one side?				
14	Do you experience poor depth perception or have difficulty estimating distances accurately?				
15	Do you experience double/overlapping/shadowed vision at far distances?				
16	Do you experience double/overlapping/shadowed vision at near distances?				
17	Do you experience glare or have sensitivity to bright lights?				
18	Do you close or cover one eye with near or far tasks?				
19	Do you skip lines or lose your place when you are reading? Do you use your finger, ruler or other guides to maintain your position on the page?				
20	Do you tire easily with close-up tasks (computer work, reading, writing)?				
21	Do you experience blurred vision with far-distance activities (driving, television, movies, chalkboard at school, etc.)?				
22	Do you experience blurred vision with close-up activities (computer work, reading, writing, etc.)?				
23	Do you blink to 'clear up' distant objects after working at a desk or working with close-up activities (computer work, reading, writing, etc.)?				
24	Do you experience words running together while reading?				
25	Do you experience difficulty with reading or reading comprehension?				
TOTALS					

	YES	NO
Have you ever been diagnosed with a traumatic brain injury (TBI)?		
Have you ever been diagnosed with a concussion?		
Have you ever been diagnosed with a lazy eye?		
Have you ever been diagnosed with a reading disability?		
Have you ever had an eye operation?		

	None	Worst	None	Worst
On an average day, how much are you bothered by symptoms listed here?				
Dizziness	0 1 2 3 4 5 6 7 8 9 10		Neckache	0 1 2 3 4 5 6 7 8 9 10
Nausea	0 1 2 3 4 5 6 7 8 9 10		Unsteady when walking	0 1 2 3 4 5 6 7 8 9 10
Anxiety	0 1 2 3 4 5 6 7 8 9 10		Sensitivity to light	0 1 2 3 4 5 6 7 8 9 10
Headache	0 1 2 3 4 5 6 7 8 9 10		Reading difficulty	0 1 2 3 4 5 6 7 8 9 10

Please record any additional symptoms you may be experiencing or specific concerns that you have about your eyes/vision:

How to score this questionnaire:

Take your answers from questions 1-25 and multiply them by their score. Add the scores to get a TOTAL score.

Always = ____ x3 = ____
Frequently = ____ x2 = ____
Occasionally = ____ x1 = ____
Never = ____ x0 = 0
TOTAL Score: ____

This questionnaire is designed to identify individuals whose symptoms (ex. headache, dizziness, anxiety, etc.) may be due to vision misalignment. Consider an evaluation by a NeuroVisual Specialist if the score is 15 or greater.

Fax this document to (248) 499-6372 or email it to support@VsofM.com and we will contact you; or call (248) 258-9000 to schedule an appointment.

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2550 S. Telegraph Rd. Ste. 100
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Revised: 05/2019

SCREENING QUESTIONNAIRE

For Ages 14 & Older

Binocular Vision Dysfunction / Vertical Heterophoria

Name _____	Date _____
Phone Number _____	Email _____

Directions: For each of the following questions, please check the answer that best describes your situation. If you wear glasses or contact lenses, answer the questions assuming that you are wearing them.

Always = every day

Occasionally = less than once per week

Frequently = at least once per week

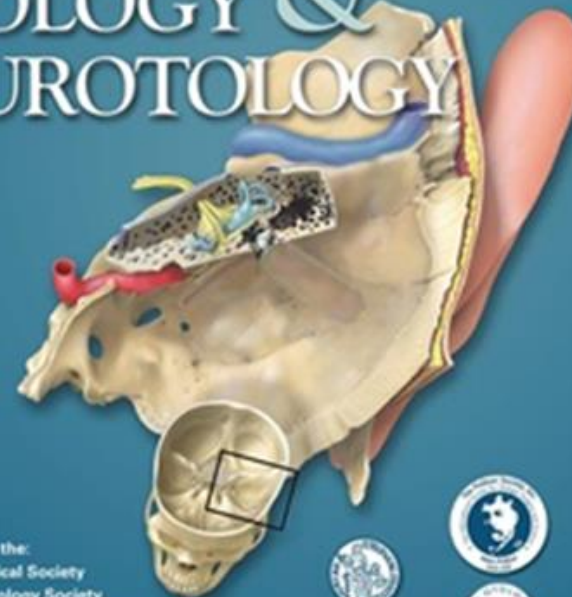
Never = never

		ALWAYS	FREQUENTLY	OCCASIONALLY	NEVER
1	Do you have headaches and/or facial pain?				
2	Do you have pain in your eyes with eye movement?				
3	Do you experience neck or shoulder discomfort?				
4	Do you have dizziness and/or light headedness?				
5	Do you experience dizziness, light headedness, or nausea while performing close-up activities (computer work, reading, writing, etc.)?				
6	Do you experience dizziness, light headedness or nausea while performing far-distance activities (driving, television, movies, etc.)?				
7	Do you experience dizziness, light headedness, or nausea when bending down and standing back up, or when getting up quickly from a seated position?				
8	Do you feel unsteady or drift to one side while walking?				
9	Do you feel overwhelmed or anxious while walking in a large department store (Target, Wal-Mart, Costco, etc.)?				
10	Do you feel overwhelmed or anxious when in a crowd?				
11	Does riding in a car make you feel dizzy or uncomfortable?				
12	Do you experience anxiety or nervousness because of your dizziness?				
13	Do you ever find yourself with your head tilted to one side?				
14	Do you experience poor depth perception or have difficulty estimating distances accurately?				
15	Do you experience double/overlapping/shadowed vision at far distances?				
16	Do you experience double/overlapping/shadowed vision at near distances?				
17	Do you experience glare or have sensitivity to bright lights?				
18	Do you close or cover one eye with near or far tasks?				
19	Do you skip lines or lose your place when you are reading? Do you use your finger, ruler or other guides to maintain your position on the page?				
20	Do you tire easily with close-up tasks (computer work, reading, writing)?				
21	Do you experience blurred vision with far-distance activities (driving, television, movies, chalkboard at school, etc.)?				
22	Do you experience blurred vision with close-up activities (computer work, reading, writing, etc.)?				
23	Do you blink to 'clear up' distant objects after working at a desk or working with close-up activities (computer work, reading, writing, etc.)?				
24	Do you experience words running together while reading?				
25	Do you experience difficulty with reading or reading comprehension?				
TOTALS					

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SCREENING QUESTIONNAIRE

Binocular Vision Dysfunction / Vertical Heterophoria

For Ages 4-8

Child's Name _____ Parent/Guardian's Name _____ Date _____

Phone Number _____ Email _____

Directions: Children - answer these questions together with your Parent/Guardian. For every question, please answer YES or NO. If you wear glasses, answer the questions assuming that you are wearing them.

DOES YOUR CHILD:

YES NO

A	have difficulty reading or learning OR skip letters or words or lines OR misread words or reverse numbers or words OR lose their place often while reading?		
B	have poor handwriting – poor letter sizing (too big or too small), poor spacing, writing lines with an upward or downward slant?		
C	avoid near activities OR do they act out after 5-10 minutes if they must perform near activities?		
D	sit very close to the TV / monitor / electronic devices OR hold toys very close to their face to see them?		
E	have difficulty identifying shapes, colors, letters, numbers and common images that are age appropriate?		
F	walk with difficulty (do they sway, trip or fall OR bump into objects or people) OR avoid climbing on furniture or outdoor playscapes?		
G	have trouble seeing the board, or seeing up close?		
H	have difficulty catching or kicking a ball?		
I	have headaches or stomach aches at school, pre-school or when away from home?		
J	have light sensitivity (closes/covers eyes in bright light) OR not like bright places?		
K	close or cover one eye when doing up close activities?		
L	have nervousness or anxiety OR get startled often OR is clingy in stores?		
M	squint or blink or make faces to "see"?		
TOTALS			

Parent/Guardian: Has your child ever been diagnosed with:

	YES	NO		YES	NO
Learning Disability (LD)?			Migraines or headache?		
Dyslexia?			Traumatic brain injury or concussion?		
Torticollis?			Does your child blink his/her eyes a lot/much more than most children?		
Lazy eye?			Are your child's verbal skills far ahead of his/her reading skills?		
ADD/ADHD?			Has your child ever had an eye operation?		

On an average day, how much are you bothered by symptoms listed here? Rate each symptom from 0-10 0 = None of that symptom 10 = Worst	None										Worst												
Dizziness	0	1	2	3	4	5	6	7	8	9	10	Neckache	0	1	2	3	4	5	6	7	8	9	10
Nausea	0	1	2	3	4	5	6	7	8	9	10	Unsteady when walking	0	1	2	3	4	5	6	7	8	9	10
Anxiety	0	1	2	3	4	5	6	7	8	9	10	Sensitivity to light	0	1	2	3	4	5	6	7	8	9	10
Headache	0	1	2	3	4	5	6	7	8	9	10	Reading difficulty	0	1	2	3	4	5	6	7	8	9	10

Please record any additional symptoms your child may be experiencing or specific concerns that you may have about your child's eyes/vision:

This questionnaire is designed to screen for children who may be having symptoms due to a vision misalignment.

Using questions A through M on the front of this page, consider an evaluation by a NeuroVisual Specialist if **FOUR or more questions were answered YES.**

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SCREENING QUESTIONNAIRE

Binocular Vision Dysfunction / Vertical Heterophoria

For Ages 9-13

Child's Name _____ Parent/Guardian's Name _____ Date _____
Phone Number _____ Email _____

Directions: *Children - answer these questions together with your Parent/Guardian.* For each of the following questions, please check the answer that best describes your situation. If you wear glasses or contact lenses, answer the questions assuming that you are wearing them.

Always = every day

Frequently = at least once per week

Occasionally = less than once per week

Never = never

ALWAYS
FREQUENTLY
OCCASIONALLY
NEVER

1	Do you have headaches or stomach aches or do you get nervous/anxious at school?				
2	While reading or watching video in a car, do you get a headache or stomach ache or feel unwell?				
3	Do you get sick to your stomach or nauseous on swings or circular rides?				
4	Do you have difficulty playing sports, or doing gymnastics or dance?				
5	Do you have trouble catching baseballs or footballs or Frisbees?				
6	When you are walking, do you bump into people or furniture or door frames?				
7	Are you anxious or nervous?				
8	Does it take you a long time to finish your homework?				
9	Do you have to read the same thing a couple of times to really understand it?				
10	When reading, do you skip lines or lose your place OR do you use a guide (finger, ruler or a piece of paper) to help you keep your place?				
11	When you read, does it look like the letters are moving OR does it seem like words are bumping into each other?				
12	Do bright lights hurt your eyes?				
13	Do you close or cover one eye to make it easier to see?				
14	Do you ever see two of everything (double vision)?				
15	When reading or working on the computer or electronic device, do your eyes feel tired or does your vision get blurry?				
16	When looking at the blackboard at school, do your eyes feel tired or does your vision get blurry?				
TOTALS					

Parent/Guardian: Has your child ever been diagnosed with:

	YES	NO		YES	NO
Learning Disability (LD)?			Migraines or headache?		
Dyslexia?			Traumatic brain injury or concussion?		
Torticollis?			Does your child blink his/her eyes a lot/much more than most children?		
ADD/ADHD?			Are your child's verbal skills far ahead of his/her reading skills?		
			Has your child ever had an eye operation?		

		None		Worst		None		Worst				
On an average day, how much are you bothered by symptoms listed here? Rate each symptom from 0-10 0 = None of that symptom 10 = Worst	Dizziness	0	1	2	3	4	5	6	7	8	9	10
	Nausea	0	1	2	3	4	5	6	7	8	9	10
	Anxiety	0	1	2	3	4	5	6	7	8	9	10
	Headache	0	1	2	3	4	5	6	7	8	9	10
	Neckache	0	1	2	3	4	5	6	7	8	9	10
	Unsteady when walking	0	1	2	3	4	5	6	7	8	9	10
	Sensitivity to light	0	1	2	3	4	5	6	7	8	9	10
	Reading difficulty	0	1	2	3	4	5	6	7	8	9	10

Please record any additional symptoms your child may be experiencing or specific concerns that you may have about your child's eyes/vision:

How to score this questionnaire:

Take your answers from questions 1-16 and multiply them by their score. Add the scores to get a TOTAL score.

Always = ____ x3 = ____

Frequently = ____ x2 = ____

Occasionally = ____ x1 = ____

Never = ____ x0 = ____

TOTAL Score: ____

This questionnaire is designed to identify individuals whose symptoms (ex. headache, dizziness, anxiety, etc.) may be due to vision misalignment. Consider an evaluation by a NeuroVisual Specialist if the score is 10 or greater.

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www.IsItMyEyes.com

Experience the Difference

You may have one or more of the symptoms listed below. But, how do you know if these symptoms are caused by your vision? This easy, five-minute test may be the proof you need.

Note: You must be experiencing symptoms right now to complete this test.

1 BEFORE

Identify 2 symptoms below that are most bothersome to you at this moment. Rate each symptom from 1-10 where 10 is the most severe and 1 is the least.

Dizziness ____/10	Nausea ____/10	Headache ____/10
Neck Ache ____/10	Sensitivity to Light ____/10	Anxiety ____/10

2 GET READY



Get a timing device (your phone, kitchen timer, etc.) and set for 5 minutes.

If you have glasses or contact lenses that you wear normally, wear them for this test.

3 DIRECTIONS

- You will need to cover one eye for this test. To determine which eye to cover, tilt your head towards each shoulder. One side should feel easier than the other.
- When you find the more comfortable side, cover the 'high' eye with your hand. (Your 'high' eye is the eye closest to the ceiling.)
- Now, return your head to the upright position.
- Keep both eyes open, but cover the 'high' eye with your hand.
- Look 8-10 feet ahead, but at nothing in particular.



4 AFTER 5 MINUTES

Keep your eye covered



For each symptom that you identified at the beginning of this test, consider how you feel right now. Rate each symptom from 1-10 where 10 is the most severe and 1 is the least.

AFTER

Dizziness ____/10	Nausea ____/10	Headache ____/10
Neck Ache ____/10	Sensitivity to Light ____/10	Anxiety ____/10

How do these numbers compare to before?

RESULTS

You may now uncover your eye.

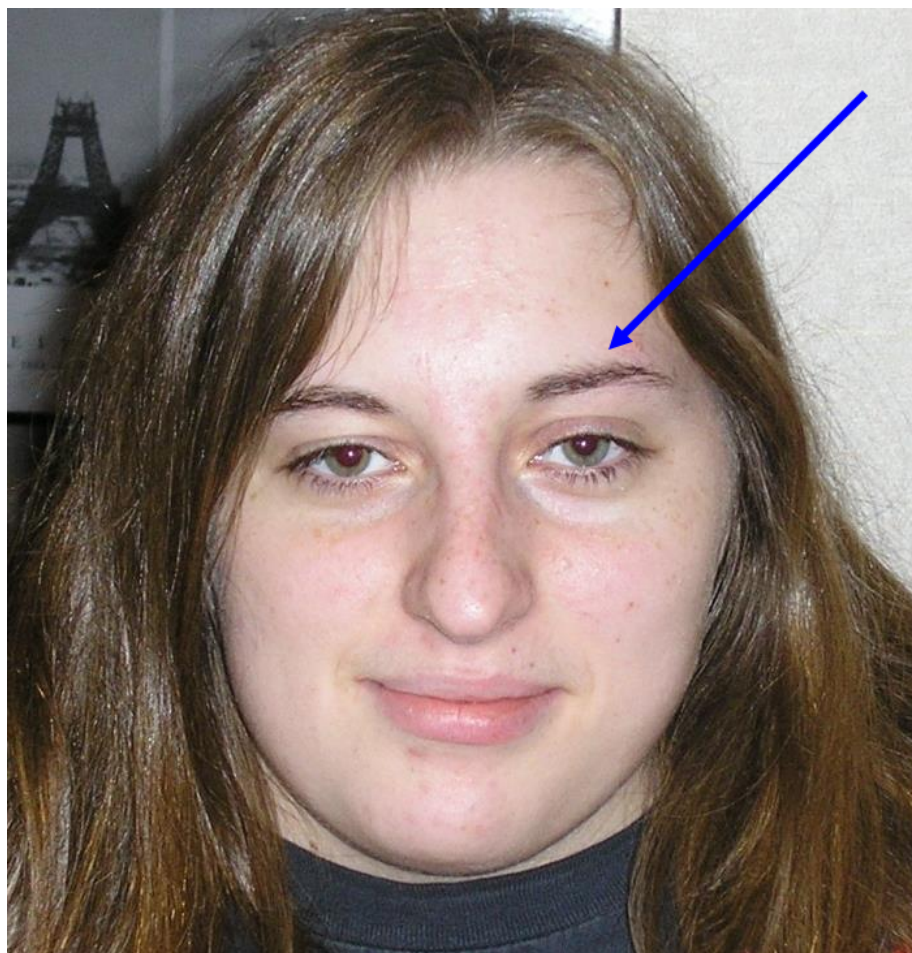
If you felt a reduction of your symptoms with one eye covered, you have a vision misalignment. We can help. Call our office at 248.258.9000 or learn more at Vision-Specialists.com

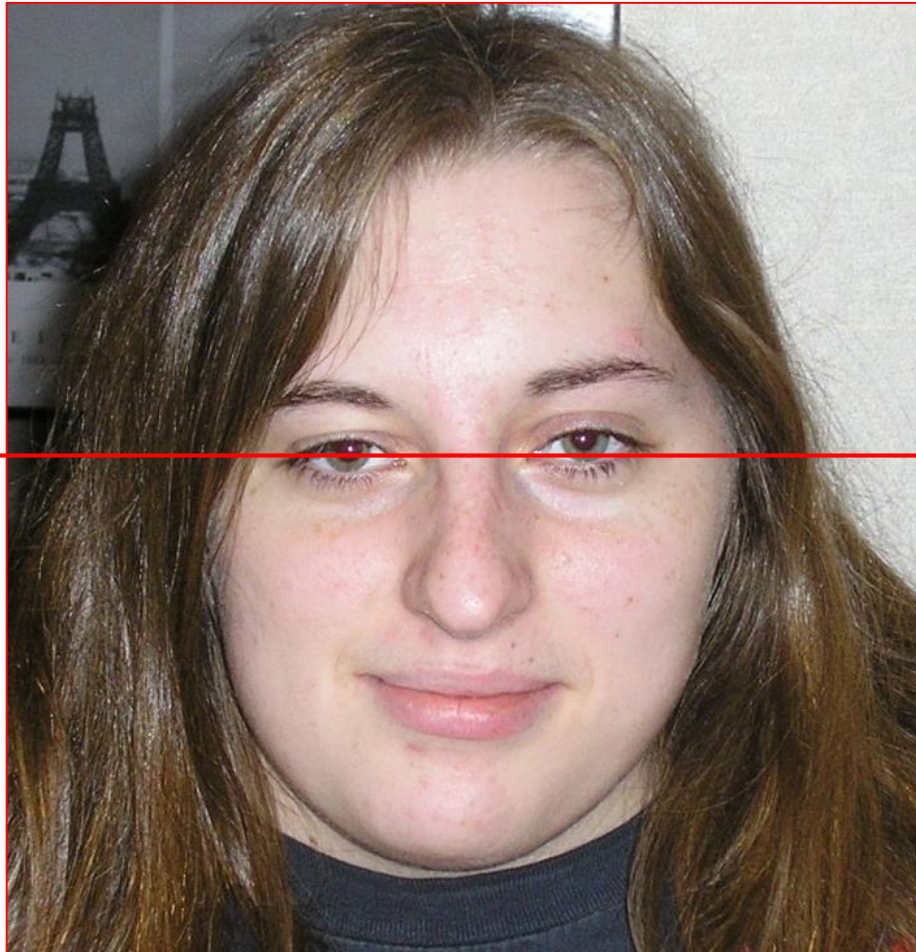
5 Minute Cover Test

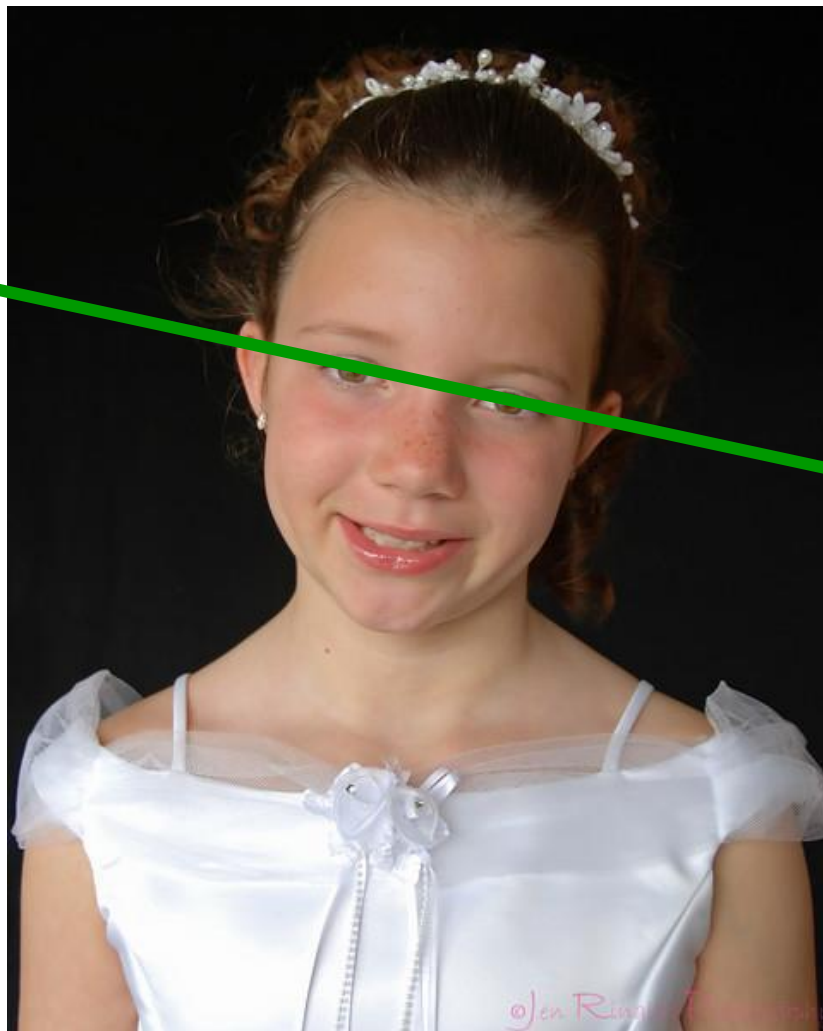
Instructions are different than for NPC testing – **“Stop when you experience:”**

- Discomfort (Dizziness, Nausea or Headache)
- Blurred or Doubled vision

6 Physical Findings of VH

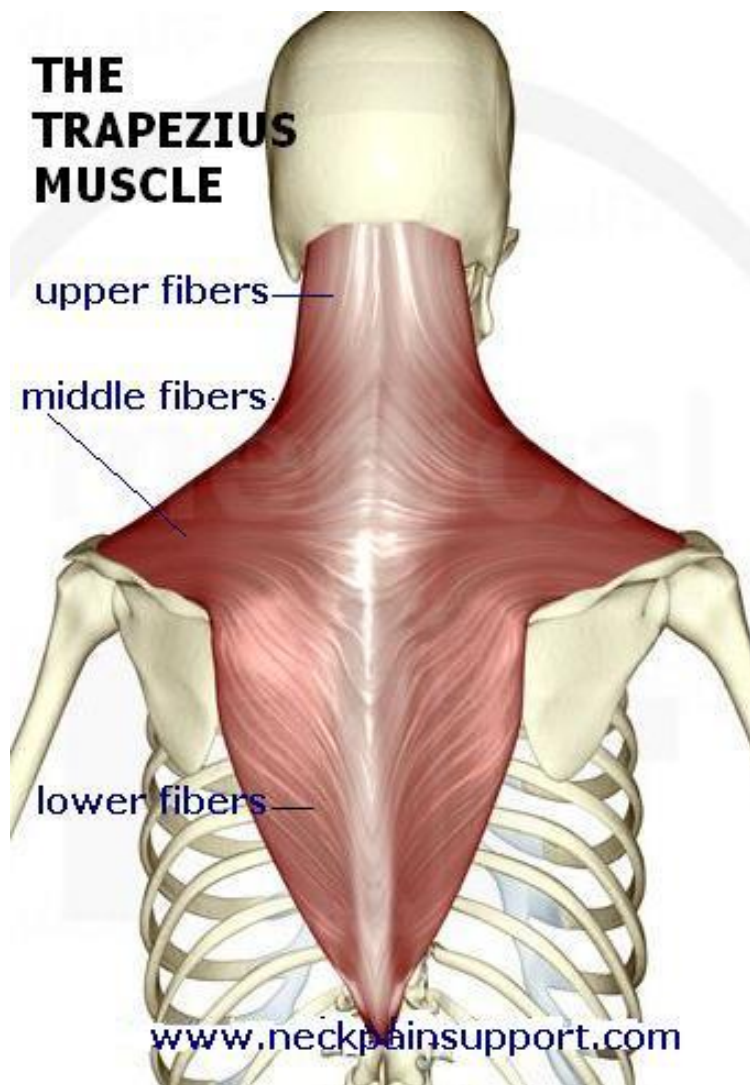






Head Tilt

THE TRAPEZIUS MUSCLE



- 5. Gait & Balance Analysis:
 - Rise from seated to standing
 - Drifting to one side with ambulation or wobbling side to side
 - Head turns while walking (Supermarket Walk)
- 6. Provocative Vestibular Tests
 - Bending over and coming back up
 - Side-to-side head movements

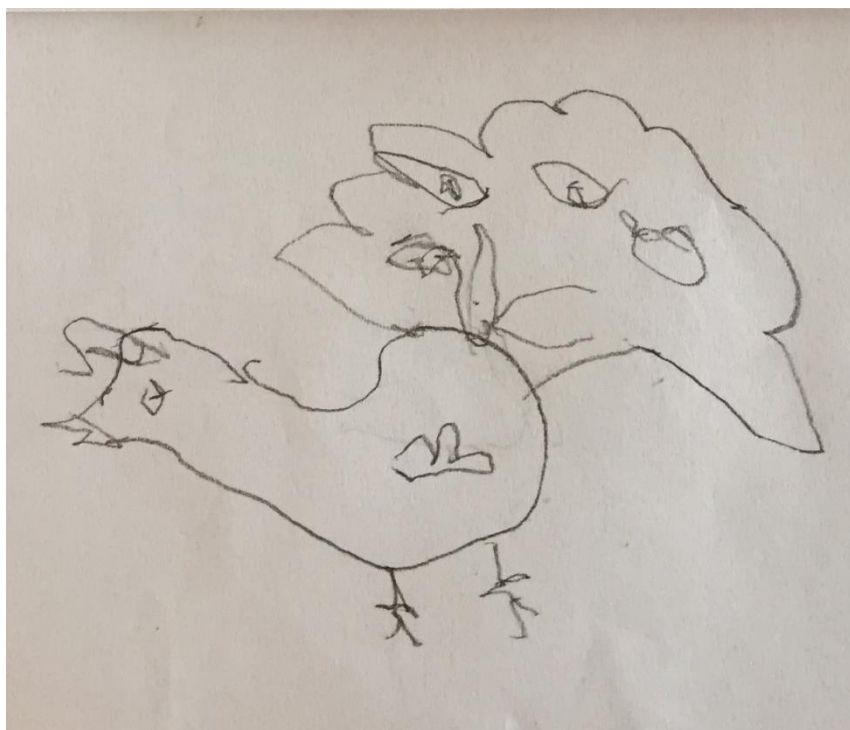
Course of Treatment



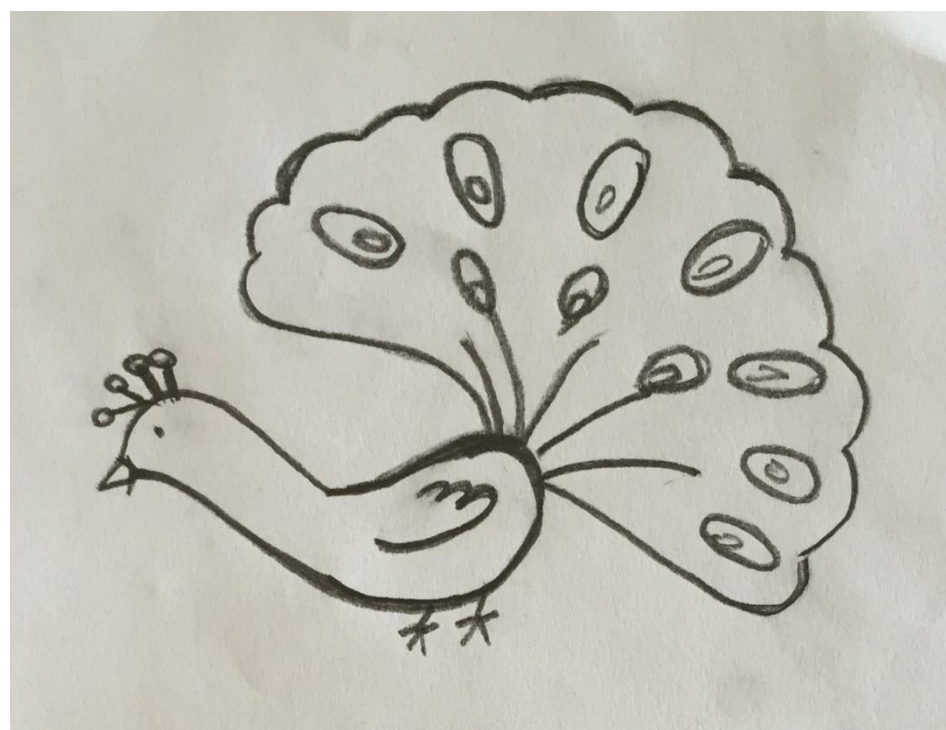
- Initial Exam (80 mins) and 1 Progress Exam (50 mins)
 - Prism Challenge Technique
 - Progressive Relaxation
- 2 sets of lenses
- Approximately 1-2 months to complete treatment
- Once initial sequence of visits is finished (2 visits over 2 months), only annual appointments are needed

- Expedites improvement with their other rehab therapies
- Expedites or enables return to school or work
- 80% reduction of symptoms
- Reduction / elimination of medications

Results of Treatment: Vision & Fine Motor Control



Before prism lenses



After prism lenses (same day)

Results of Treatment: Vision & Fine Motor Control

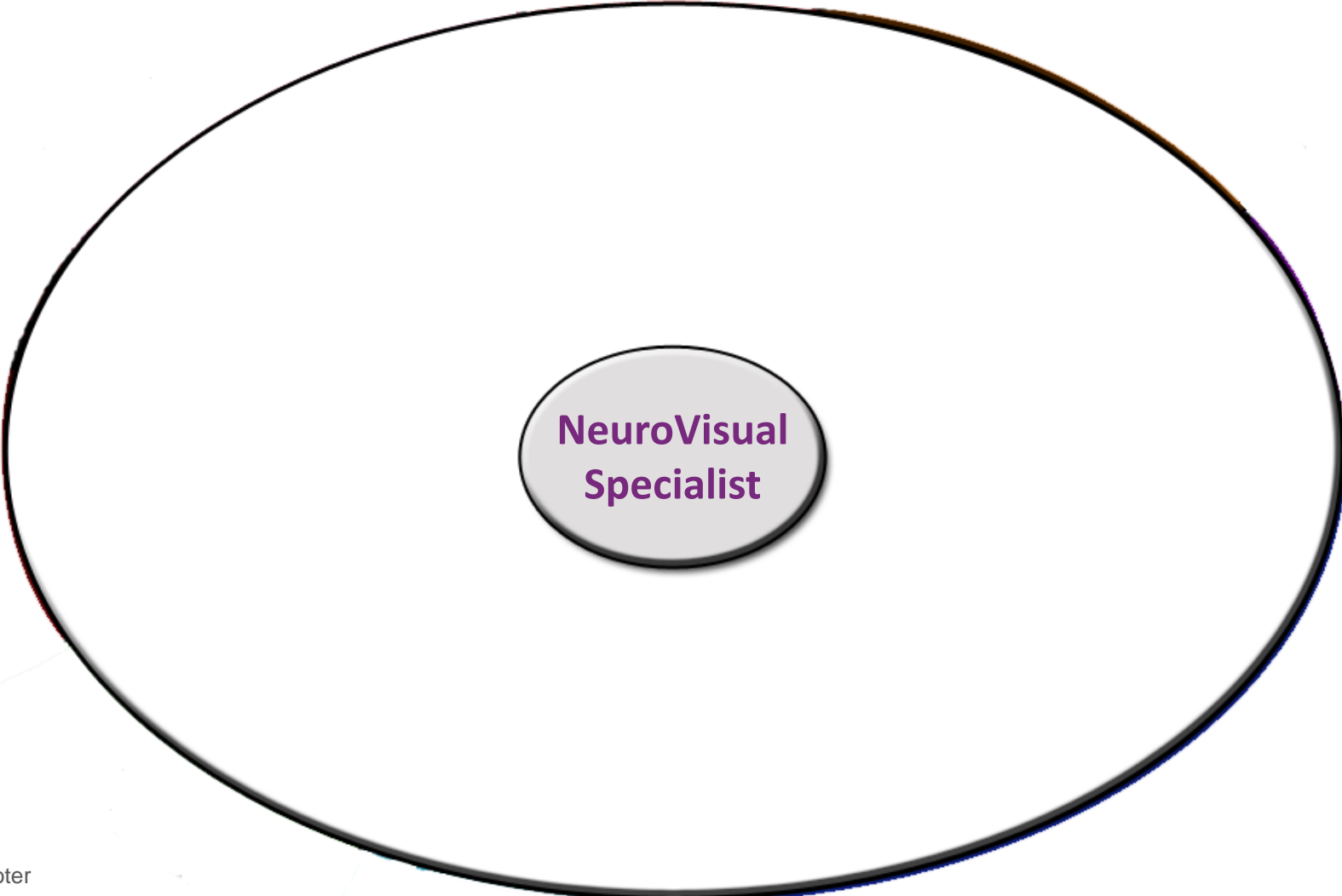


Before prism lenses

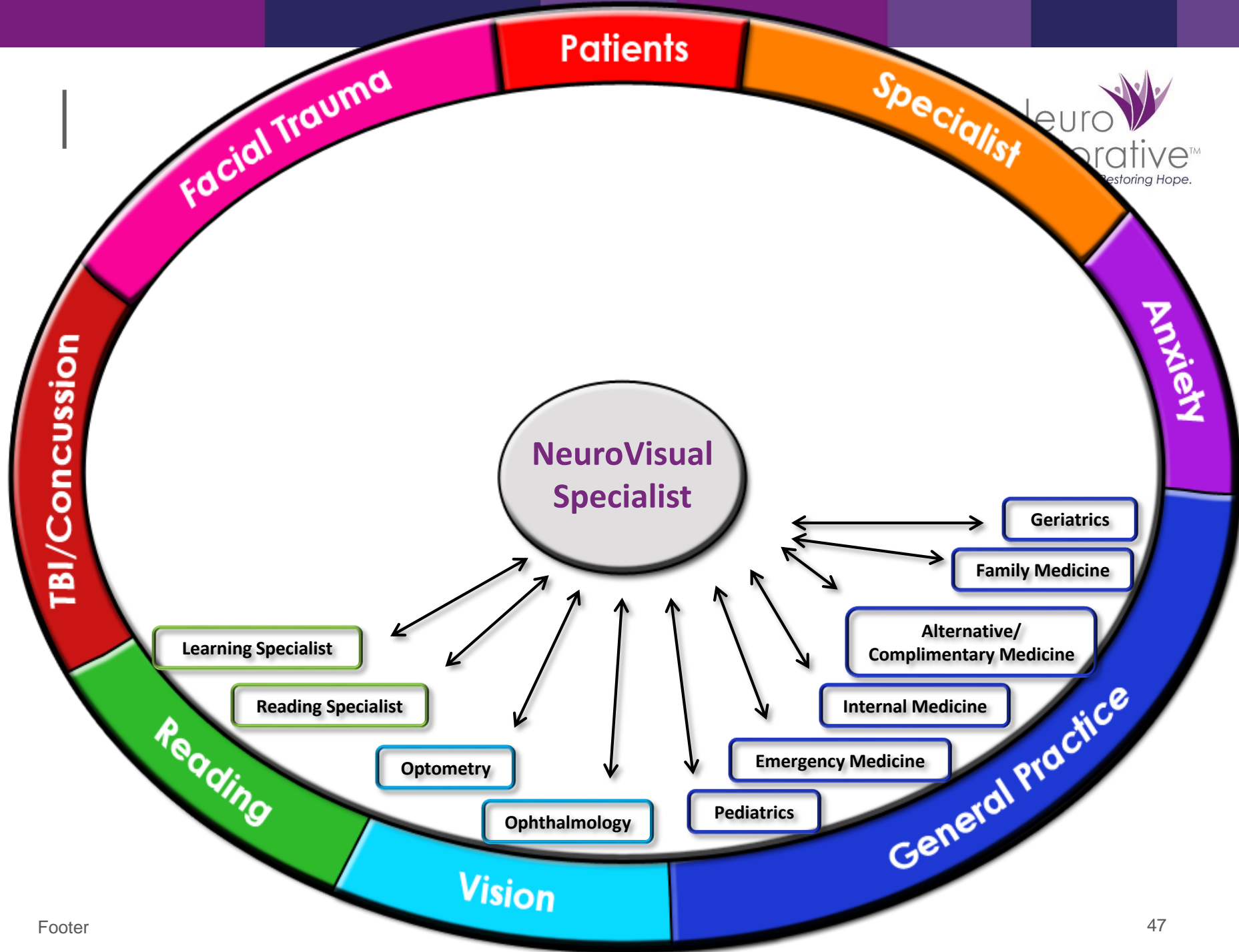


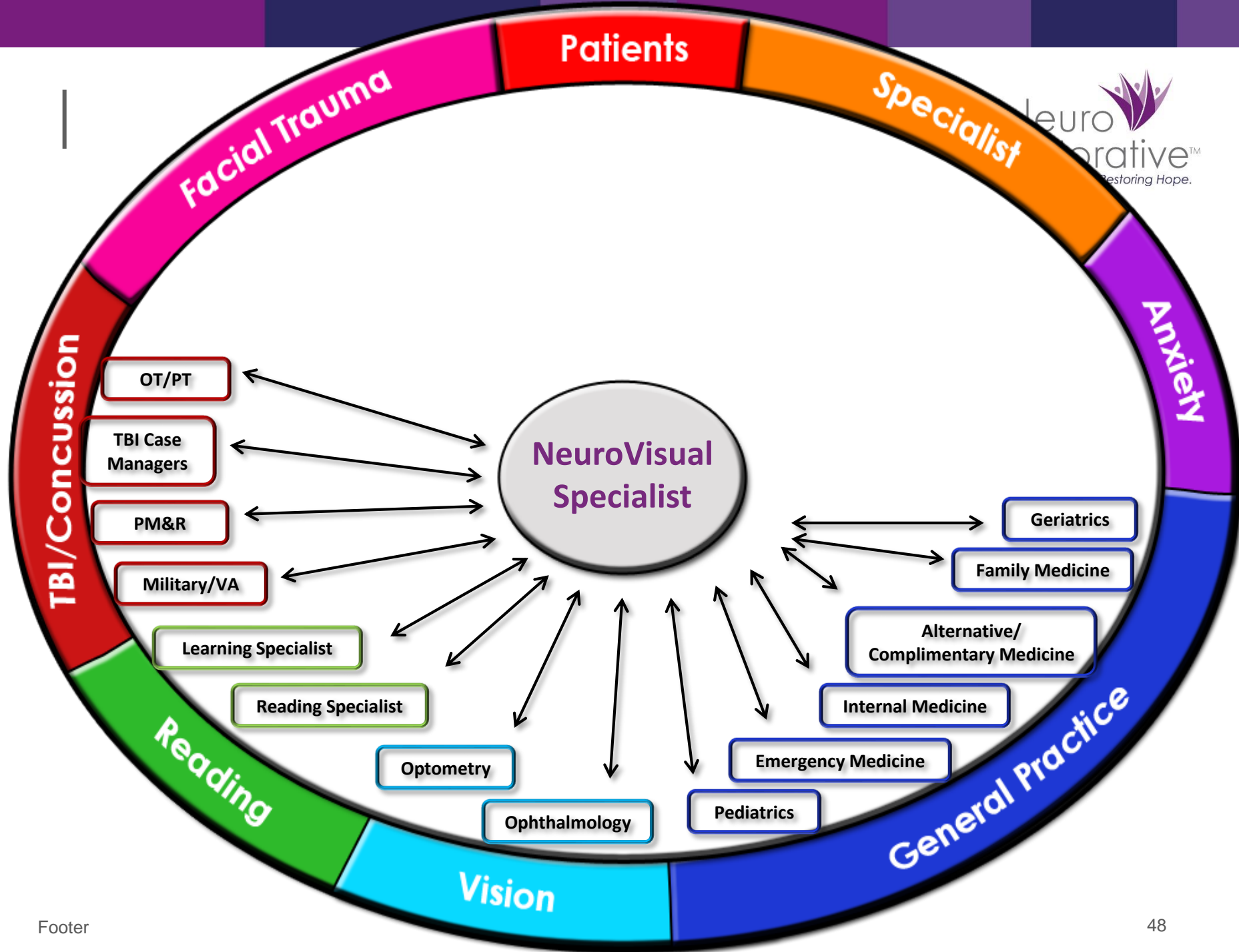
After prism lenses (same day)

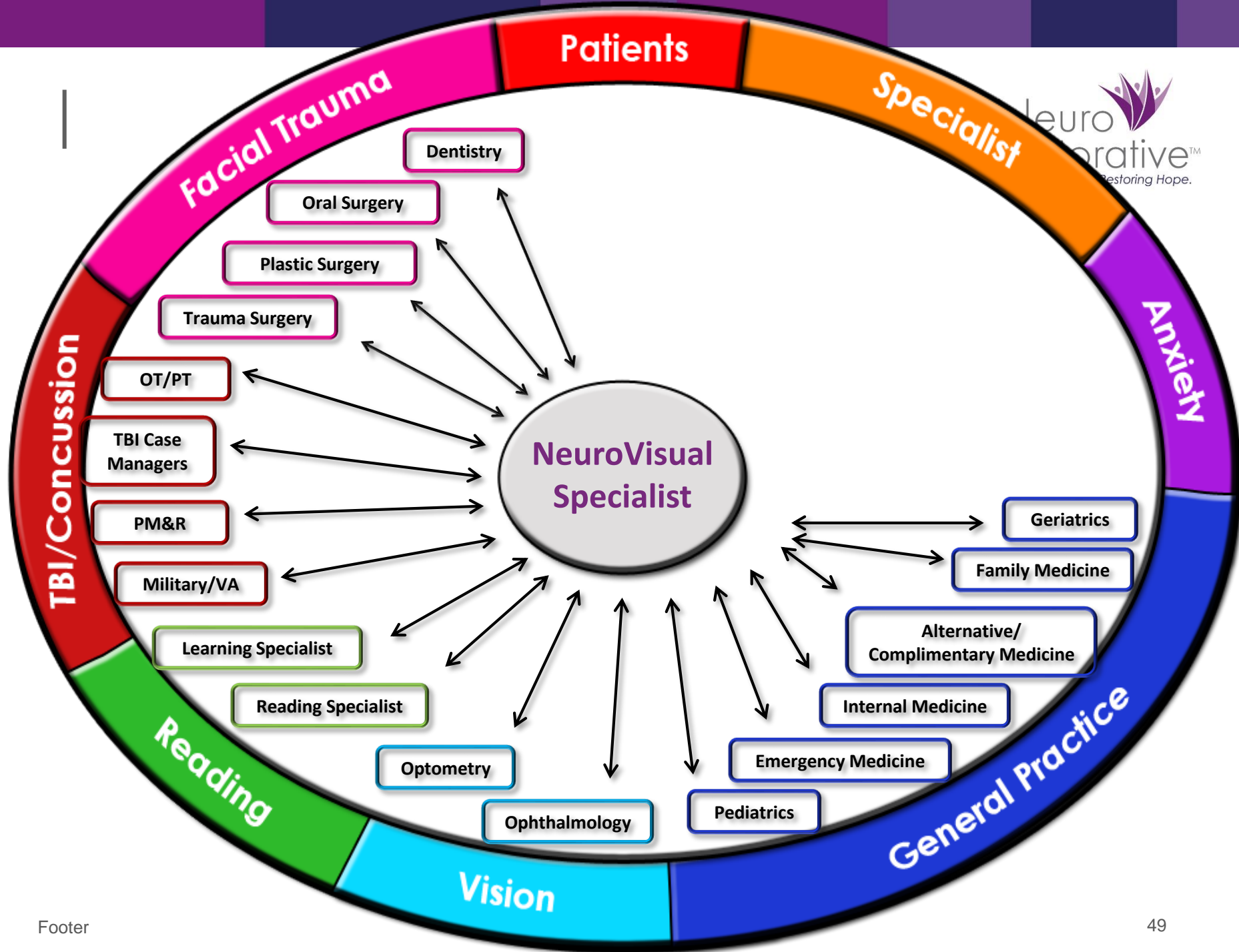
| Collaboration With Medical Community

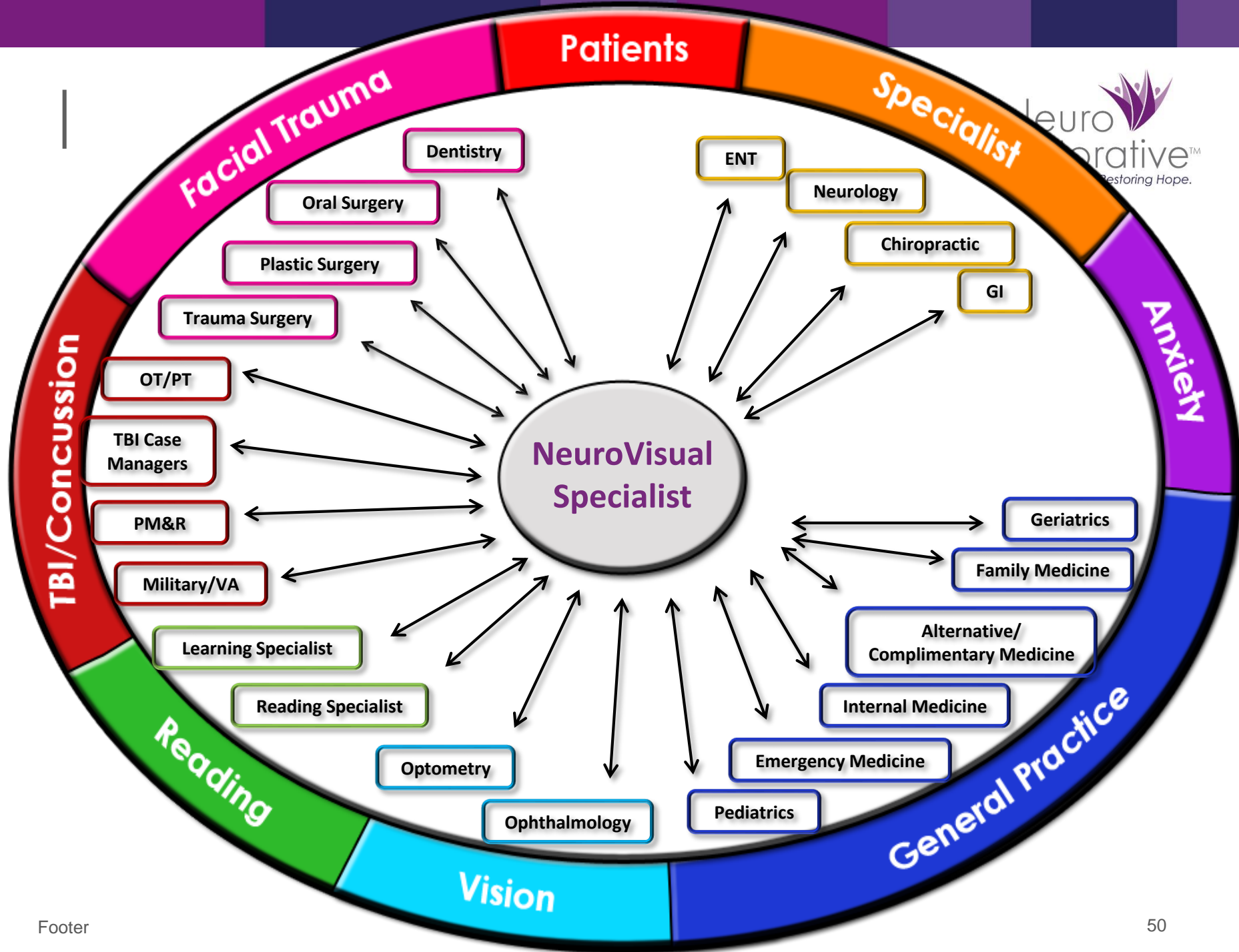


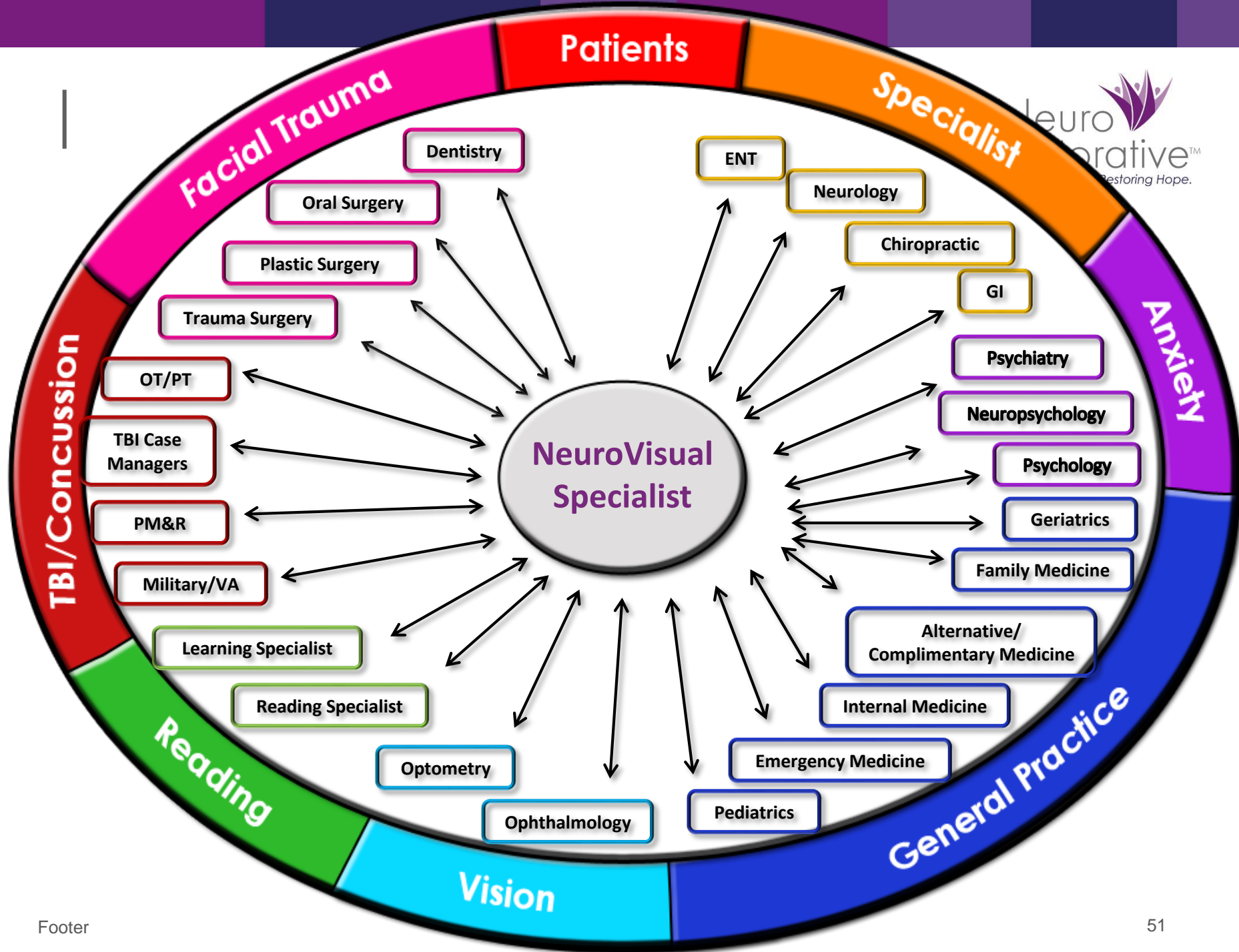
NeuroVisual
Specialist











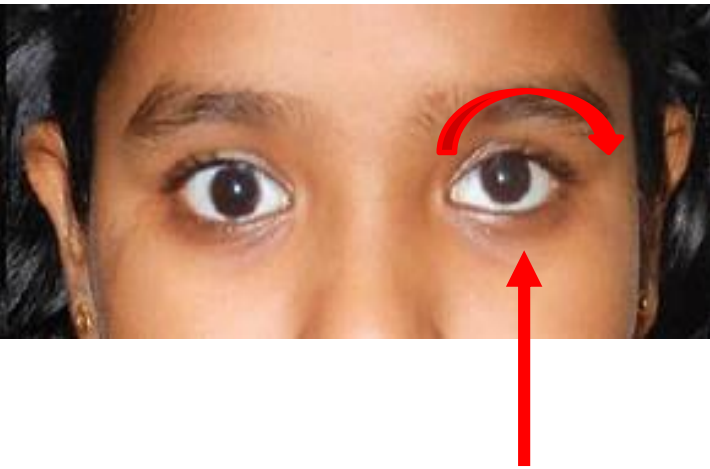


| Pathophysiology of VH

- Monocular
- Binocular

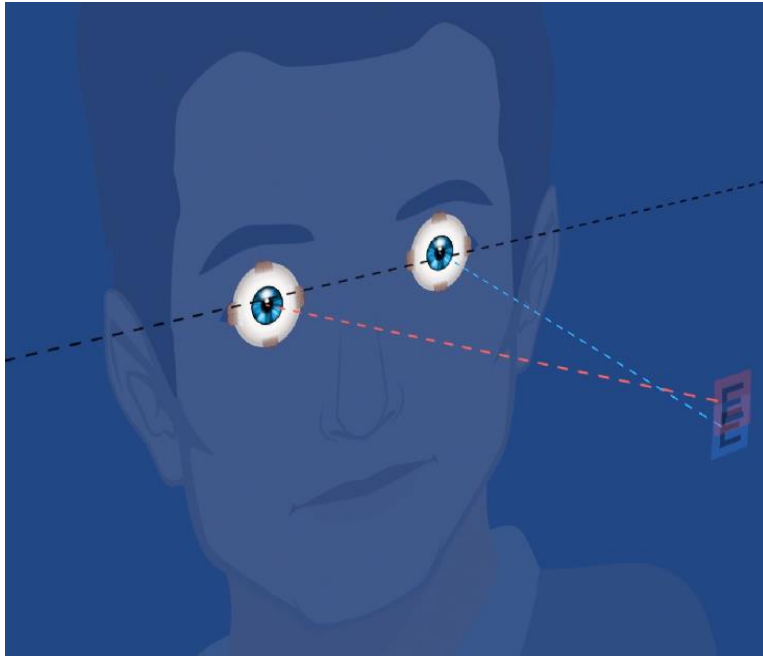
Pathophysiology of Monocular VH:

SOP- Eye Muscle/Nerve Dysfunction



- CN IV and/or Superior Oblique muscle is weak unilaterally – results in eye with upward gaze and cyclotorsion
- This is only a Visual System problem – Vestibular System not involved
- Visual system response to impending vertical diplopia: realign the images vertically
 - Misalignment/realignment cycle causes symptoms
- Body response to impending diplopia from cyclotorsion: Head tilt

Pathophysiology of Binocular VH: Vestibular Dysfunction & Visual System Response



- Faulty signals emanating from the vestibular system impacting vertical alignment in both eyes
- The visual system responds to this impending diplopia by realigning the images
- Misalignment/realignment cycle causes symptoms
- Microprism lenses break the cycle

| How Symptoms Are Caused

- EOM overuse and strain
 - Headache

- Cycling / Back & Forth
 - Vibrating/shimmering
 - Reading difficulty
 - Vestibular symptoms:
 - dizziness
 - nausea
 - gait and balance disturbances
 - motion sickness

| How Symptoms Are Caused

– Anxiety

- Visual sensitivity to complex environments like grocery store aisles, certain wallpaper and carpet patterns
- Optokinetic stimuli (like driving on the freeway)
- Dizziness is a known precipitant of anxiety

– Binocular Vision

- Reading difficulty
- Blurred images / diplopia
- Glare / photosensitivity



Head Tilt

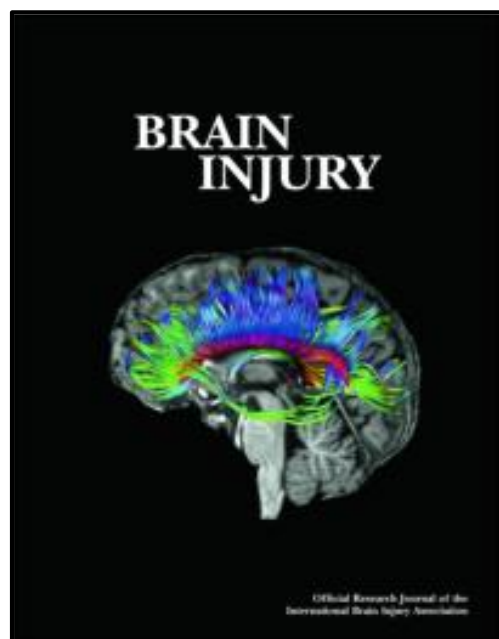
Research And Academic Activities

Treatment of vertical heterophoria ameliorates persistent post-concussive symptoms:

A retrospective analysis utilizing a multi-faceted assessment battery

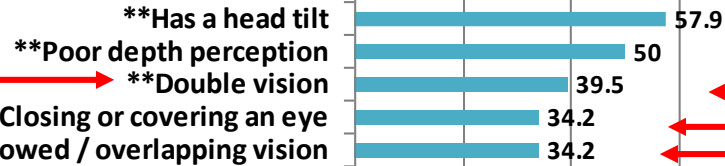
Mark S. Rosner, Debby L. Feinberg,
Jennifer E. Doble & Arthur J. Rosner

Brain Injury 2016

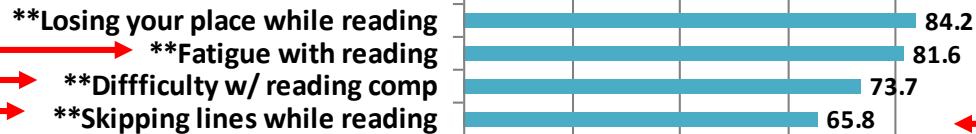


BVD Symptoms In TBI Patients (% of patients)

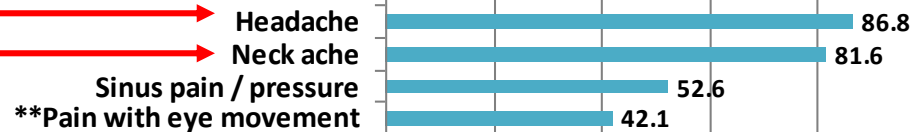
BINOCULAR VISION SYMPTOMS



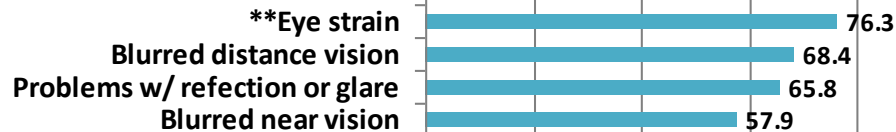
READING SYMPTOMS



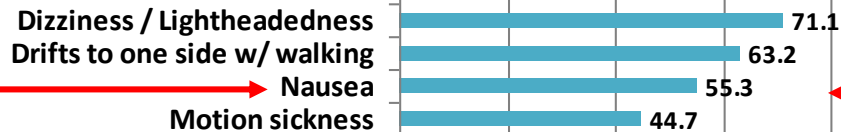
PAIN SYMPTOMS



VISION SYMPTOMS



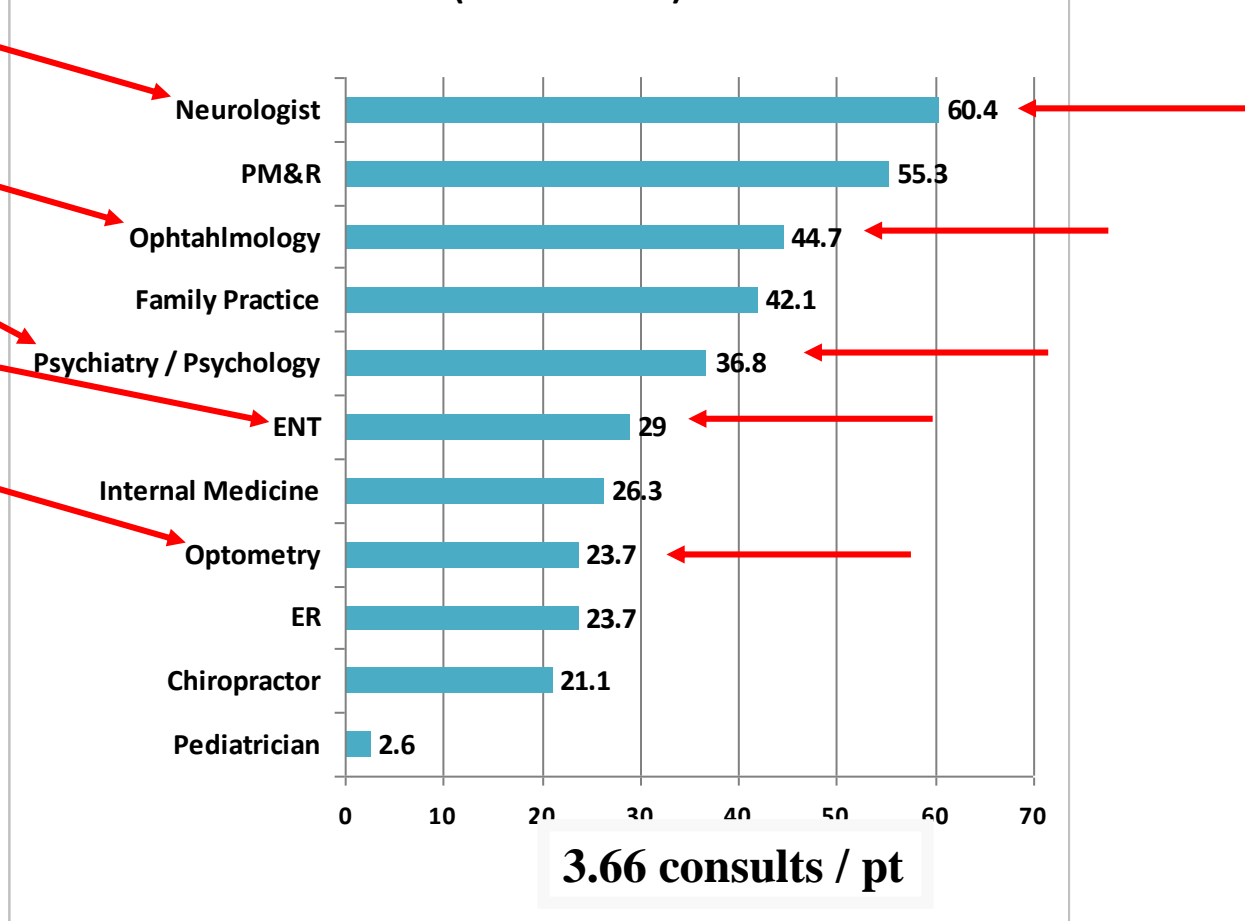
VESTIBULAR SYMPTOMS



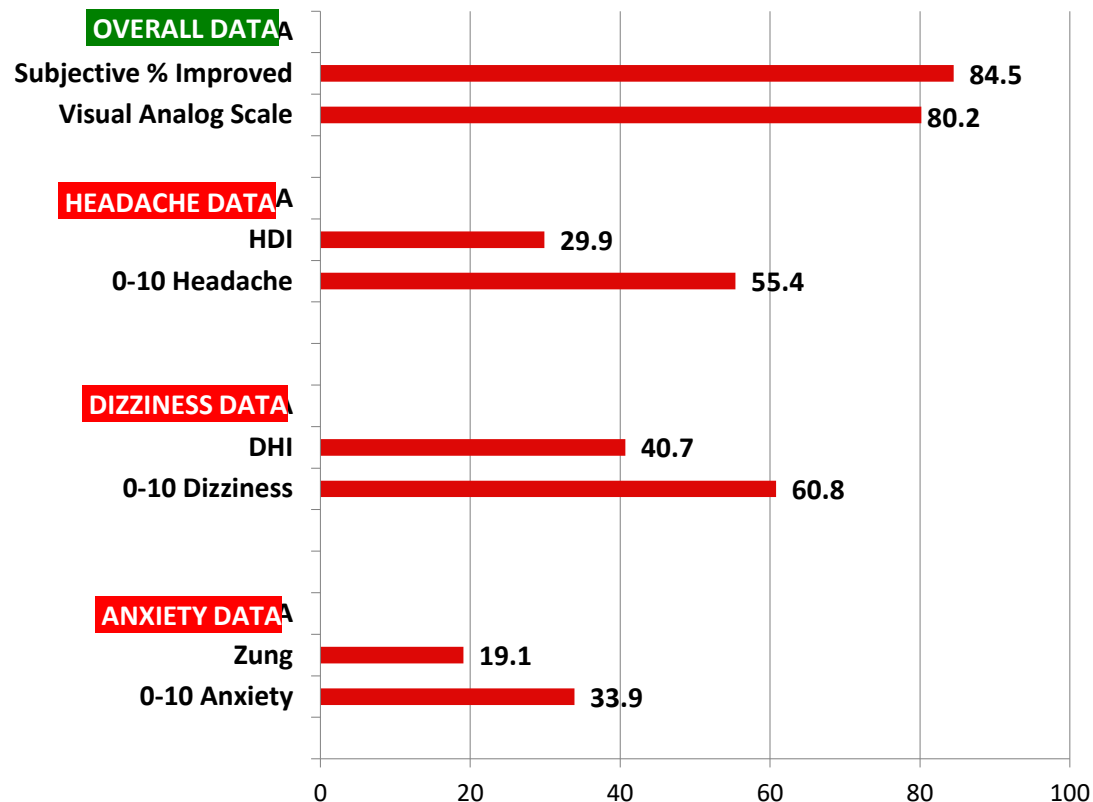
ANXIETY SYMPTOMS



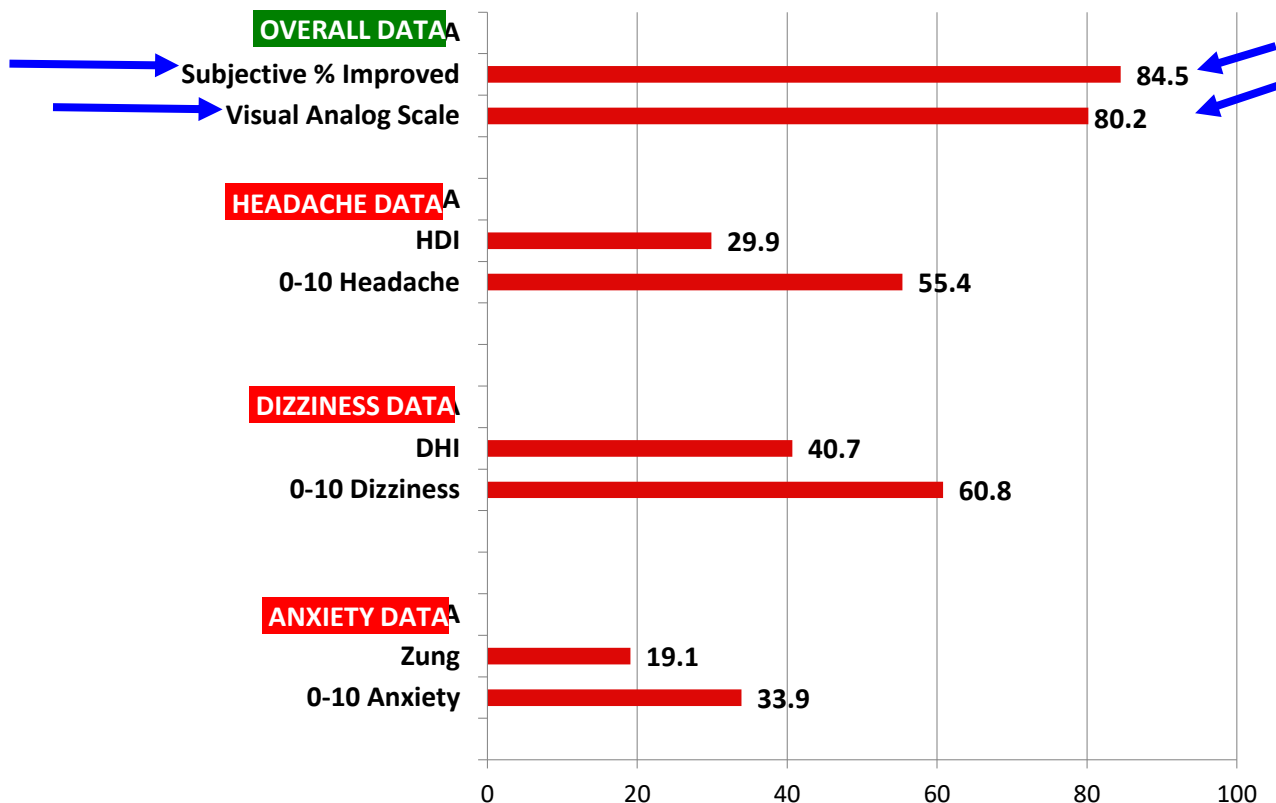
Specialists Seen Prior To VH Diagnosis (% of Patients)



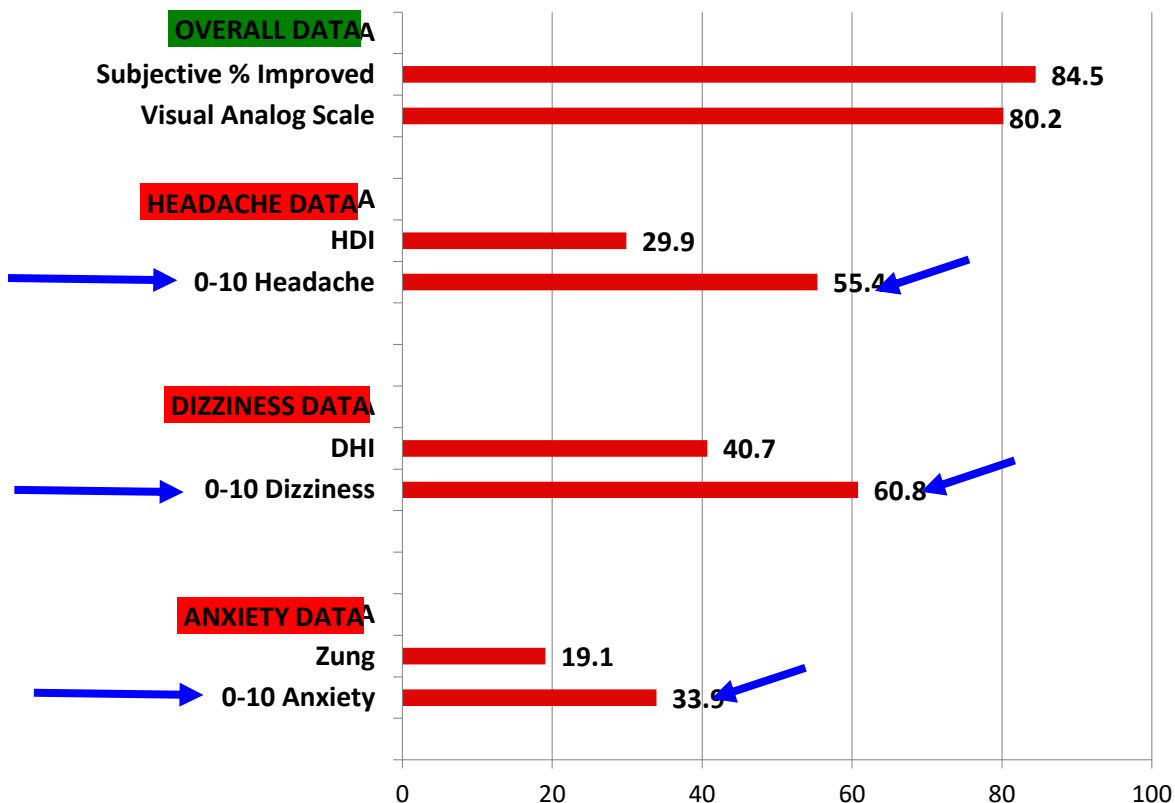
% Reduction of Headache, Dizziness and Anxiety Metrics With Prism Lenses



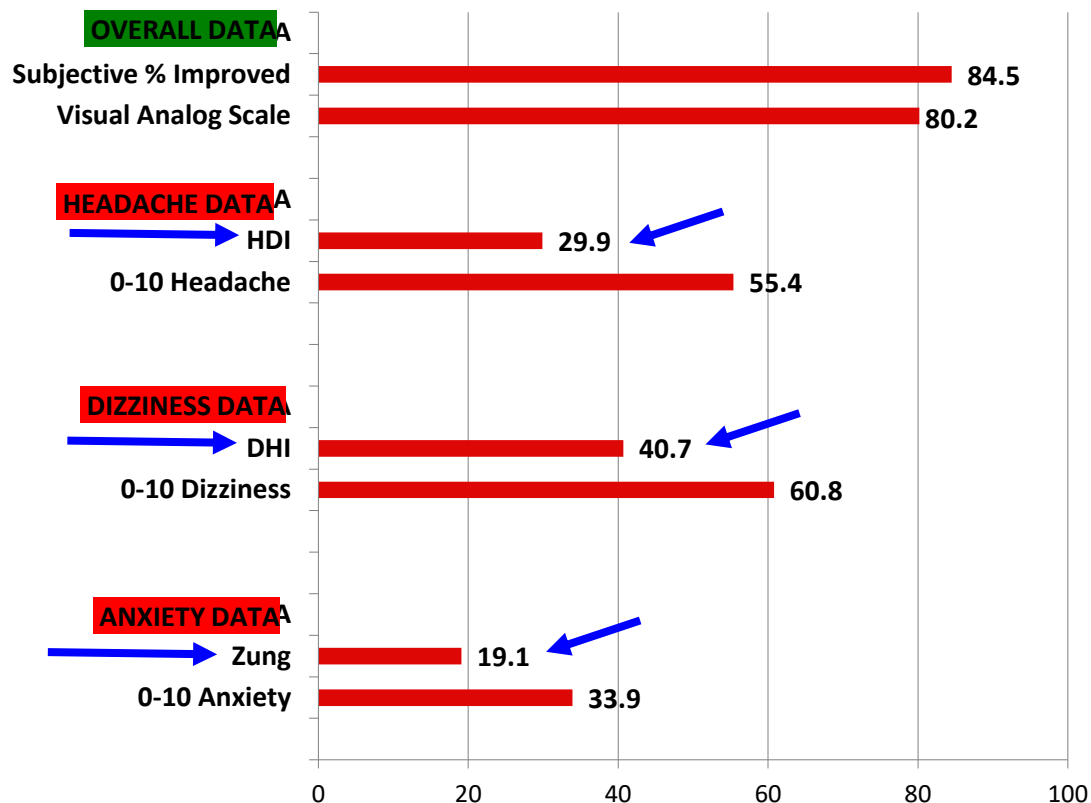
% Reduction of Headache, Dizziness and Anxiety Metrics With Prism Lenses



% Reduction of Headache, Dizziness and Anxiety Metrics With Prism Lenses



% Reduction of Headache, Dizziness and Anxiety Metrics With Prism Lenses



| To Summarize



| Summary



- Binocular vision dysfunction (BVD) appears to be present in ~20% of the general population and in ~50% of all TBI / ABI patients with persistent symptoms (>3 months), and **~50%** of those with reading/learning challenges.
- The symptoms of BVD are not being recognized as being visual in etiology, despite extensive testing and consultation. These patients are seen by multiple providers yet don't get much better with standard treatments /therapies.

| Summary

- Treatment of the BVD with realigning prismatic lenses reduces symptoms **80%**
- **BVD Suspects** can be easily identified with the BVDQ and the 5 Minute Cover Test
- BVD can be firmly diagnosed (and prism prescribed) by the **Prism Challenge Technique**
- Standard binocular vision tests **are not sensitive enough** to identify this patient population

| Which Children Can Potentially Be Helped?

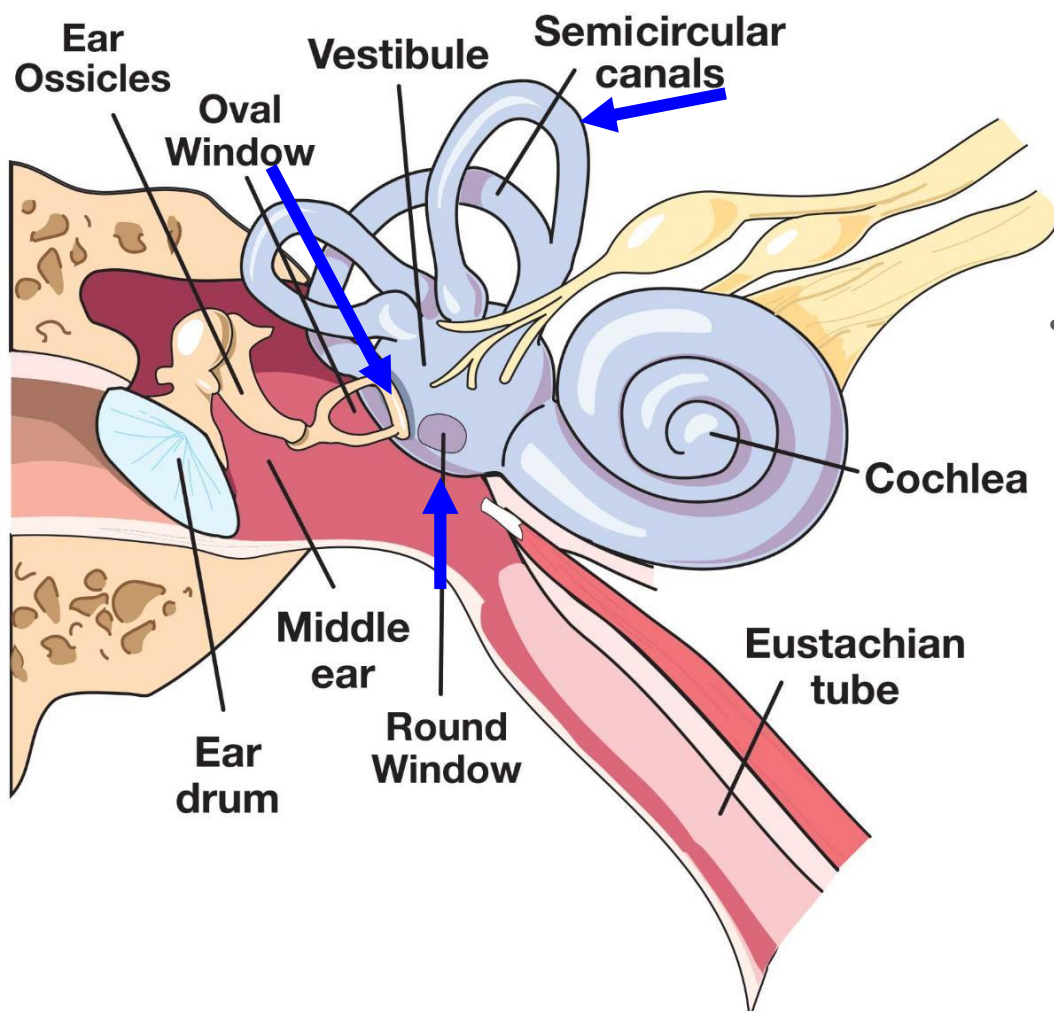


- Children with “reading and learning difficulties” (LD; RD)
- Children with difficulty concentrating and/or “hyperactivity” (ADD/ ADHD)
- Children with motion sickness / car sickness
- Children that are clumsy / uncoordinated

Bvd & HYPERACUSIS/TMWS

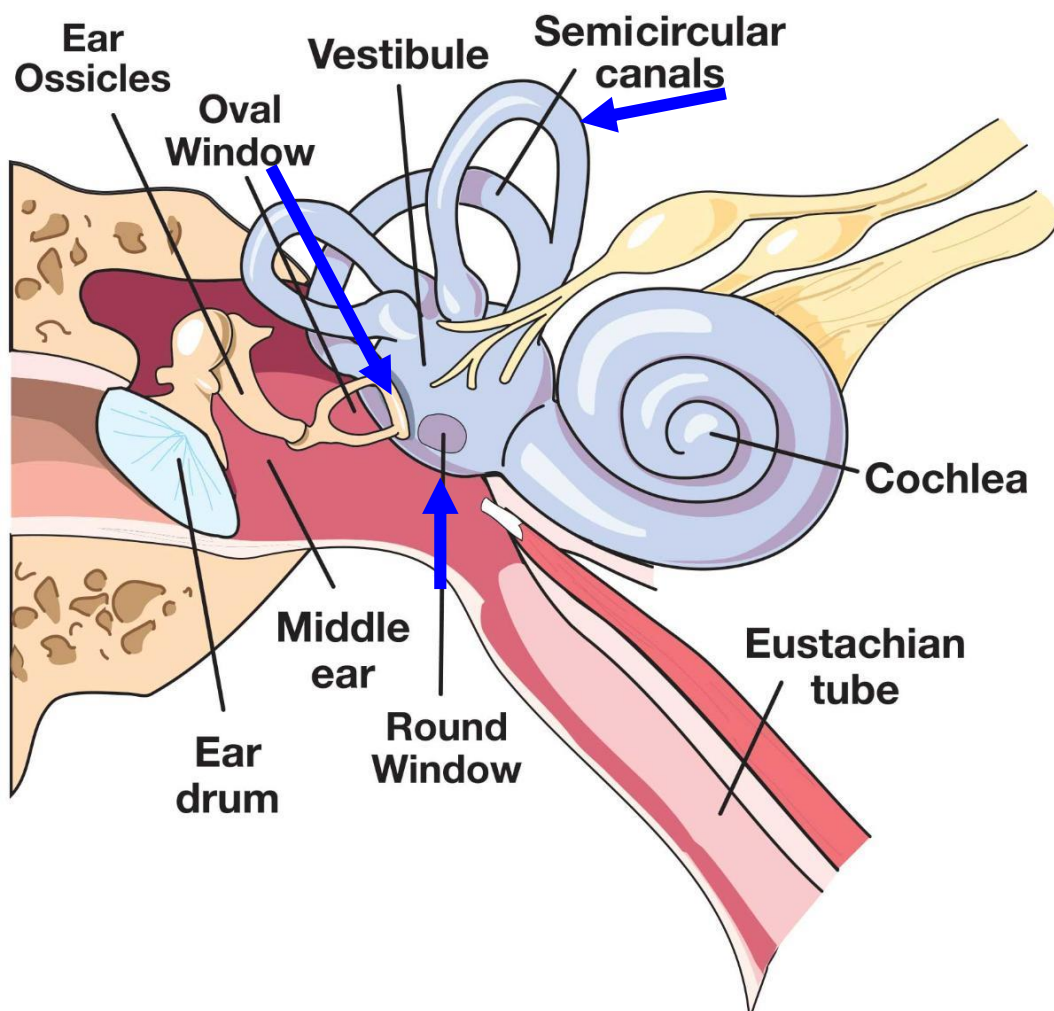


Pathophysiology of TMWS



- VOR
- Inner ear anatomy / function:
 - Inner ear is surrounded by bone
 - Round & Oval windows (2 windows)
 - Pressure is constant
- Problem with the “V” of VOR
 - Hole (dehiscence) in bone OR leak (perilymph fistula) in Round/Oval window creates a **3rd window**
 - Pressure is fluctuating
 - Allows sound waves to stimulate the vestibular apparatus – utricle in particular - (normally they don't)
 - This impacts visual alignment through VOR

Pathophysiology of TMWS



Tullio Phenomena (1929)

- Drilled hole in pigeon's semicircular canal
- Dizziness, imbalance with gait and nystagmus are induced by sound

Now we understand why

| Symptoms of TMWS

Most common:

- **Sensitive to sound**
- **More sensitive to sound when compared to your friends/family**
- However, the majority of patients are not aware that they are sensitive to sound.
- That is why we test every patient with NCDs

Anything that reduces the components of Tullio phenomena:

- Reduce sound input into the ear (“Reverse Tullio Phenomena”) with NCD’s, ear plugs
- Medications to reduce inner ear pressure to allow for healing of hole/leak & pressure stabilization
- Surgical repair of the hole/leak for pressure stabilization

Bose QuietControl 30



QC30 – Wireless earbud style. Available for **both** Samsung/Android Devices and Apple Devices (due to Bluetooth capabilities)

Bose QuietComfort 20



QC20 – Wired earbud style. Available for **either** Samsung/Android Devices or Apple Devices

Bose QuietComfort 35



QC35 (Series I) – Wireless headphone style. Available for **both** Samsung/Android Devices and Apple Devices (due to Bluetooth capabilities)

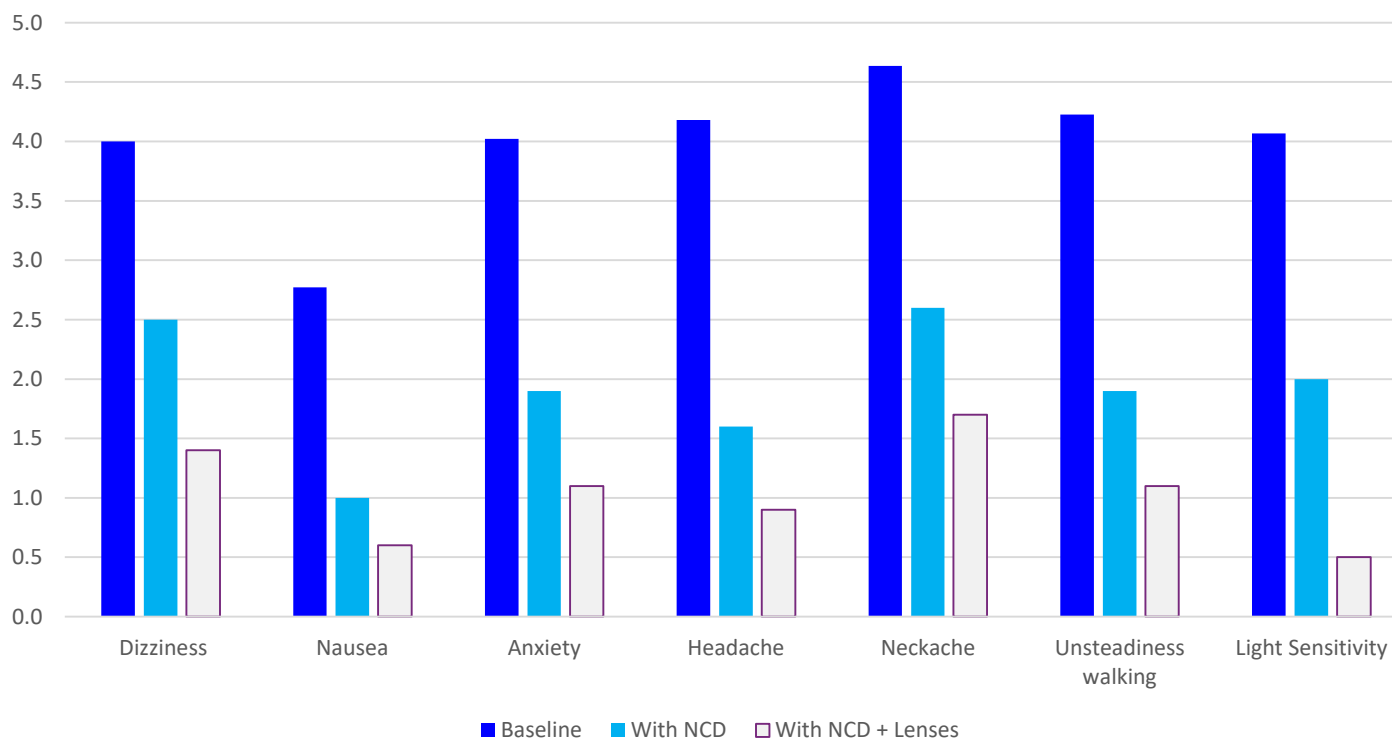
Apple Air Pod Pros



Wireless earbuds with active noise cancellation. Comes with three sizes of silicone tips. Compatible with Android Devices.



Impact of NCD's and Lenses on Symptom Severity Upon Initial Evaluation







**ASK AND TEST EVERYONE FOR
HYPERACUSIS!!**



Questions?

