The Physical Therapist and AIA Vision®
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Some History

Many years ago Dr. Heidi Wise began working with patients who were seen to have difficulty with organizing conscious movement of their bodies into the left hemisphere. A review of the literature demonstrated that vision could play a significant role in either limiting or assisting hemispheric shifting of the body. Through prescription of specific optical lenses she could enable patients to adequately alter the position of their center of mass into the left hemisphere. This became a solid mechanism for treatment of many individuals and worked well for many years…but oftentimes the results were less than desirable.

Experience with patient care caused Dr. Wise to realize that more could be done. She moved her practice to Georgia so that she could bring her concepts to the up-and-coming Applied Integration Academy® (AIA®). It was from this fertile ground that new concepts sprouted. Chief among those concepts was the idea that not all humans benefit from being shifted into the left hemisphere. To be sure, altering visual perception remains a solid mechanism for treatment of patients, but more data on human movement, outlined in the Spectrum Of Patterns® evaluative instrument from AIA®, showed that there was more to programming human movement than simply shifting bodies to the left with glasses. Many patients also need to learn how to move to the right. The need for bilateral movement ability was made clear in several patients she treated but also with Dr. Wise herself. She was also a patient in need of treatment and had been, ill-advisedly, shifted into the left hemisphere as part of her treatment plan. Her symptoms were ever-increasing until it was discovered that she needed exactly the opposite of her previous treatment plan. Dr. Wise knew that upright movement patterns could be enhanced and corrected using visual programming and AIA Vision® programs are designed to take advantage of vision integration to allow for correct occupancy of each hemisphere. AIA® concepts like Occupancy and lateralization are explained and differentiated in supporting AIA® documents[8]. AIA Vision® has developed a systematic, structured program called The Body and The Sight© for vision integration that is designed for the movement specialist. The need for a structured program is due to the lack of clarity and simplicity with existing postural/visual programs. Without structure or simplicity, the potential for vision programs to fail is quite high. This failure rate is also partly because of:

- Incorrect initial screening of patients (creating a vision patient when the patient actually isn't one)
- Poor diagnostics (shifting patients into the wrong hemisphere)
- Inadequately trained Optometrists
- Inadequately trained Movement Specialists
- Weak or absent follow-through with the vision program
- Difficulty managing multidisciplinary variables (dental appliances, glasses, shoe orthotics etc)--The Human Condition is Messy!
- Too many professionals treating the same patient at the same time with poor continuity of care
- Too many professionals treating the same patient that do not have common principles and treatment methods/goals

Another reason many vision programs fail is because of a lack of confidence on the part of the movement specialist and not the optometrist. This is because many vision program treatment plans were never clearly outlined with goals, or mechanisms to measure any goals if they were even established. And, perhaps, the main reason vision programs fall short is because they were never systematized or understandable.

An Introduction To The AIA Vision® Program

What is "Vision" and What is its Role In Gait?

Vision is everything that the brain does with what the eyes see
~Dr. Heidi Wise OD

We can take advantage of Dr. Wise's concept of vision, if we understand 1) What IS happening (deriving meaning from objects seen) and 2) What SHOULD happen (directing of action about what was seen).

What is the difference between vision and sight?
Sight is merely how clearly you can discern details such as letters or objects that you are looking at (central visual field) and how well you can see motion or light in the areas that you are NOT looking at (peripheral visual field). Sight is an ability that is reflected in an anticipated "normal" eye exam. Good sight can be created with glasses or contact lenses. Being diagnosed with good sight does NOT mean that you can USE your sight well. That segues into having good vision.

Vision is: “The deriving of meaning and the directing of action as a product of the processing of information triggered by a selected band of radiant energy”.
~Dr. Robert Kraskin OD

We already know that gait is the successful rotation of the center of mass of the body from one hemisphere to another[8]. Vision is the primary autonomic influencer of gait. Somewhere between 50-90% of the brain is involved with vision and visual processing. The autonomic function of gait and of visual processing for gait provides us with an opportunity to regulate body movement through the use of vision and vision programming. Details of how bodies rotate, patterns of rotation,compression and grounding, lateralization vs occupancy, and the Spectrum of Patterns® (SOP®) evaluative instrument are outlined in the Foundations for Body Movement article produced by AIA®.[8]

To achieve efficient, appropriate gait cycles, there are two visual concepts that should be heavily considered.

1) <u>There should be correct spatial recognition and timing of that recognition of peripheral visual information</u>. In other words: Do I process the object I see at the right moment and was it actually where I thought it was? Is it moving in the opposite direction relative to me as I move? Additionally, the empty space around you is as important as the objects therein.
   Consider this example: if an individual stands on solid ground, on the edge of a cliff, his body patterning and behavior is likely to be different than if he is on solid ground in his kitchen. (Figure 1)

Figure 1

2) The eyes and head must move independently of each other, to allow for unrestricted cranial bone movement. This is important when considering freedom of cranial movement and strain patterns as well as when considering dental occlusion. This is because the extraocular muscles (EOM's) attach to the body of the sphenoid via an annular ring, the frontal bone , the lesser wing of the sphenoid and the maxilla[9]. If the eyes are obligated to move with the cranium (not independently of the orbits), then this tension creates a cascade of issues resulting in pain, difficulty of movement and other problems can occur. Eyes tend to not move independently of the orbits when they are too heavily relied upon for postural stabilization. EOM's are very strong (300 times stronger than necessary for globe (eyeballs) movement within the orbits (sockets)) and are quite capable of focusing too heavily on objects you see rather than attending to the space around you. When this "hypervigilance" occurs the postural outcomes can be devastating to normal movement system-wide. Reduction of hypervigilance can be accomplished through enhanced peripheral awareness and independent movement of the globes within the orbits.

There is an overarching theme that needs to be understood when developing AIA Vision® programs. Movement, both visually and with the rest of the body, focuses on compression and expansion. Loading through a particular hemisphere requires Occupancy[8]. Occupancy (arrival in a particular hemisphere, remaining in that hemisphere and escaping from that hemisphere) is vitally dependent upon chamber compression in the abdomen/pelvis and ribcage. To escape that hemisphere the use of ground reaction force coupling (the result of successful chamber compression) is enhanced by movement INTO the opposite hemisphere.

Consider that the visual field is also compressing and expanding!

When occupying the right hemisphere during forward locomotion, the visual field on that same side is actively compressing. This means that the right forward field is moving toward you as the body is moving forward and the right lateral visual field is moving past and away from you. If this is done correctly, the left visual field should be expanding and "making room" for occupancy as it comes toward you. As the body moves toward this expanded left space, it takes advantage of the chamber compression provided by the right side and propels itself into the open arena of view on the left side and then begins the compressing as previously described for the right[10,11]. This concept can be collectively referred to as optic flow but, more importantly, it is optic flow applied in a realistic way so that we can use the concept for actual treatment[12,13].

When Occupying the left hemisphere, the left peripheral visual field should be the most active peripheral field. When on the right, then the right. Hemispheric occupancy is maximized in mid-stance during the gait process. The concept of "Visual Centering" is synonymous with mid-stance during gait. Visual Centering is defined as the ability to correctly use selected bands of radiant energy input (sight) and the sense of the floor to "occupy" a hemisphere when in the upright position. Visual Centering assessment is a tool used to evaluate an individual's ability to "visually" occupy a hemisphere. (more on this later).

Eyes are primarily for seeing and not for postural stabilization. This is an oversimplification but if the eyes are overused for controlling upright posture, then it is likely that a vision program will be helpful. To place it in perspective, if the teeth are clenched, then they too are likely being overused for postural control and a dentist may be needed to help manage the client. If someone is constantly holding their breath, then it is likely that the diaphragm is being overused for postural control and a breathing program may be beneficial. If the tongue is down or thrusting, then it too is being overused for postural or breath control and a myofunctional therapist may be needed. Some patients are "all of the above"!

We can divide the entire vision program into two categories: Diagnostic and Treatment. This means that first we must learn how to determine who needs a vision program (diagnostic) and then what to do once this is determined (treatment).

How to "spot the vision patient" and "what to do"

Perhaps the main pathway of referral to a vision program has been "nothing else worked". This is a bit of an oversimplification but is something that many clinicians have considered as viable. To be sure, "Nothing else worked" is a valid consideration but it has holes in it. For example: even if everything else the clinician has tried has not helped, this is no guarantee that vision will. There should be a few ways to screen patients…and there are. It should be emphasized that a movement specialist need not be an optometrist; no more than they need to be a dentist. If the movement specialist has a rudimentary grasp of visual concepts and understands that vision assists in the control of human movement, then half the battle is won. We should also understand that the optometrist is not a "technician" to carry out our "orders"; no more than the dentist is. Both of these professions are physicians and both can assist the movement specialist immensely when they work closely with the movement specialist. The optometrist brings to the arena an intimate understanding of the eye and the brain and can help the movement person understand why a vision program may or may not work. This is not unlike the dentist who may say, for example, that a PADA is inappropriate for

a patient since the patient has significant tooth damage that must be resolved before a PADA program can begin. Therefore, when movement specialists screen for vision patients, the outcome informs the examiner whether vision is a factor that needs attention. If it is, then vision is usually being inappropriately used for postural control. If that is the case, then an AIA Vision Program *WITH OR WITHOUT* an AIA-Trained Optometrist may be appropriate.

The Screen (Spotting the Patient)

Contemplate these 8 considerations when determining a vision patient.

1. History the patient may report or you may observe "red flag" items like:
    a. Poor sense of the ground (usually mentioned without prompting)
    b. An inability to move eyes independently of the skull (noticed during interview)
    c. A tendency to fixate on objects per report or observation (especially when upright–this is a good example of using vision for postural control)
    d. An observed tendency to look down when walking (sometimes self-reported or reported by a loved one and most times observed during gait analysis). This obviously diminishes peripheral attention.
    e. Repeated ankle injuries, especially if idiopathic[20]
    f. History of head trauma (concussions)
    g. Consider as well, any history that indicts the hamstrings as too flexible: ballet, cheer, gymnastics, yoga etc. If hamstrings are too flexible, then the likelihood of that patient being a "vision patient" goes up. This is because the use of vision to stabilize the system goes up because the system is inherently unstable when hamstrings are too flexible.
    h. The patient is getting worse during treatment, especially in the neck and head
    i. Small ball athletes (baseball, tennis, golf) who need sharp eyesight and focal vision more than periphery during their sport
    j. Orthostatic Tachycardic syndromes like POTS (they usually have a compromised sense of the ground and vision programming may help them)
    k. The tall, narrow patient. They may have had movement challenges for a very long time as a result of body type. Thus, vision is more likely to be recruited for postural stability during development.

Or The Following Visual Indicators:

l. An eye turn or “lazy eye” (developmentally we suspect that something went awry in gross motor development and the visual system was altered at an early age and that vision programming may assist)
m. Poor reading fluency or comprehension (they may have poor reading tracking or be overusing eyes for stabilization rather than for seeing)
n. Unstable vision Rx as an adult or Rx’s from young age or frequent increases in Rx from a young age
o. History of eye or neurological disease that compromises their sight, particularly if the ability to see periphery is damaged
p. Reports of dizziness, poor balance, motion sickness, “brain fog” (otherwise known as inability to think clearly), fluctuating clarity of vision
q. Use of “progressive lenses” (not always an issue but should be considered) or monovision (naturally, through contacts, or by surgery such as LASIK, PRK, or cataract surgery)

2. OA control. Inability to maintain Occipito-Atlantal (OA) stability (10 degrees at the OA joint) after addressing the feet, the occlusion, and G-HOPE activities[14,15,16].

3. Nothing Else Worked. If nothing else about your program worked, consider the above in the history because if there does not seem to be a visual component in the history, then you may want to be careful about referral for AIA Vision®. Consider closely the existing program and make sure that it has been carefully thought out and implemented. There may be something missing in your already-good program that is preventing progress. Consider collaboration with a mentor or colleague. You could try implementing vision integration activities on your own without a referral for eyewear. This is often helpful and never hurts. Also, we should all take care that we don’t “halo” everyone into a particular program. This is to say, for example, that not everyone is a pelvis patient but, oftentimes, when a clinician takes a pelvis course, suddenly every patient is a pelvis patient. Not everyone is a vision patient, so, just because “vision” is on your mind, does not mean that the patient needs vision intervention. Be careful.

4. Blocking down-gaze. To block down-gaze one need only take a pair of glasses (like safety goggles) and tape the bottom of the lenses with opaque tape so that the patient cannot see down to the floor in front of them while they walk. Looking straight ahead, however, their vision is clear and not blurry. This may be enough to disrupt their habitual patterning into a particular hemisphere and result in objective changes in static testing upon reexamination. If you see positive changes (the patient objectively improves with many or all static tests), then an AIA Vision® referral or your own vision programming would make sense.

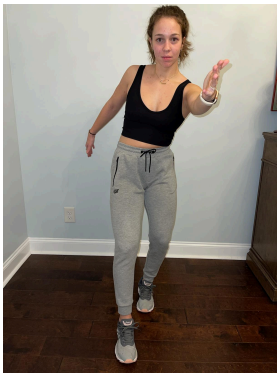
5. Blocking peripheral vision To do this simply take the same glasses and, with opaque tape block right or left peripheral vision. Remember, left periphery is needed when in left occupancy and vice versa for right occupancy. If the patient needs right peripheral vision and you take it away, they will worsen and vice versa for left. If they need left peripheral vision and you take away right, they may improve with testing. And vice versa.

6. Enhancement of specific visual periphery. In some cases there is difficulty figuring which peripheral vision needs enhancement. Column 2 and 3 patients on the AIA Spectrum Of Patterns® evaluative tool may need greater right peripheral enhancement while column 4 and 5 may require greater left. Research shows that greater left enhancement tends to be the default need as it is usually less regarded by the brain than the right in most humans. This is because right peripheral vision is represented on both sides in the cerebral cortex[21]. The left is as well but not as significantly. Additionally, it has been shown that stimulation of the left peripheral visual field produces “greater and more reliable” autonomic responses[23]. However, many humans require enhancement of the opposite visual field and we need to know which is the greater need. This can be determined by reducing peripheral vision on one side and then the other and retesting; not unlike discluding left or right molar contact and determining which works best. The results may assist the examiner with decision making on AIA Vision® referral and prescription of activities.

7. Observation of quality of ability to shift center of mass over the left hemisphere and right (Visual Centering). Look for differences. Look for “Listing” or “Leaning” rather than true “Centering”, which indicates inability to correctly load the hemisphere or ground through that lower extremity. (Figure 2) “Leaning” or “listing” possibly indicates an inability to reconcile body chamber compression[8] with visual field compression.[10,11] This screen is less reliable and should be considered along with other screens.
Let us take a moment and Re-visit (from the top of page 5) the term “visual centering” as it relates to hemispheric occupancy. Centering: Centering in gait reflects the mid-stance phase of gait, which is the point at which Occupancy (desirable) can occur or Lateralization (undesirable) can occur. Occupancy is, in part, a reflection of visual confirmation. This means that peripheral visual awareness can facilitate proper Occupancy of a hemisphere.

Figure 2

Centered



Lean

List

8. Removal of "Progressive Lenses" Does that mean just taking off their glasses? No. Because that may result in blurred vision so much so that they are unable to adequately appreciate the space around them and have nothing to do with removal of the progressive lens and more to do with just not being able to see at all! The best way to know for sure that it was the result of the removal of the progressive nature of the lens is to use a trial frame with their distance Rx in place or to use a pair of their own single-vision, distance-only glasses in place of the progressive that you had them remove. This may result in reduction of symptoms, reduction of pattern or both. If so, then the movement specialist may need an AIA Vision® optometrist to assist with treatment of the patient. Sometimes all that is needed is removal of the progressives. That may be enough by itself. And/or removal of progressives coupled with an AIA Vision program WITHOUT an AIA optometrist referral (you can do this!). Again, not all progressive lenses nor surgical procedures necessitate AIA Vision® programming or an AIA Optometrist-managed program.

Pre-Treatment Program Set-Up (What to Do)

Before a proper vision program is carried out it is imperative that the patient be solidly managed in the area of dentistry. This is because the stomatognathic system is exquisitely "wired" for proprioception and without proper occlusal, glossal and buccal ability the patient will not be "stable enough" to pursue the vision program. Think of the stomatognathic system as the "platform" upon which the vision program is built. We cannot very well ask a client to use a visual assist to shift the center of gravity to the right if the patient cannot find solid right molar occlusion. This is because grounding sense on the right is carried out via right heel and arch contact with the floor, right pelvic and rib cage compression, right molar contact and internal rotation of the left palate and

right temporal bone. Without that ability to contact those right molars or internally rotate that left palate while in right stance, the patient will never be able to take advantage of the vision “assist” provided by a pair of glasses designed to move the center of mass to the right. The mouth will trump the eyes nearly all the time, but you will discover an exception to this sooner or later.

Also, if there are glossal ties or buccal or lingual ties (restrictions of soft tissue associated with the tongue or cheeks or lips) then the ability to shift the center of mass to the right can be further restricted in spite of having devices like an ALF or PADA in the patients’ possession. One can easily see the number of variables that come into play as each of these areas are considered and subsequently managed! Keep a careful watch as you proceed.

Additionally, we must also consider the feet and the feedback that they provide to the visual system. At the very least, the patient should be in a good pair of shoes (see the AIA shoe list 2023) and may also need to be in a good pair of orthotics designed to specifically assist in shifting the center of mass into the desired hemisphere such that the patient can, for a period of time, exhibit no significant pattern. Then and only then can we consider a vision program. Also, we must be prepared to change those orthotics or shoes as the situation changes. The variables continue to grow and this makes it imperative that we keep a close watch on these variables as the vision program gets underway.

The final consideration is to manage your patients’ expectations of the program. Clinical experience has shown that many “vision patients” have come to believe that the vision program is going to resolve all of their issues. This is not the case. The only thing a vision program does is allow a movement specialist to teach a client how to arrange the body in an equilibrated position, with the ability for bilateral occupancy. A vision program is not a panacea. It is incumbent upon the movement specialist who is trained in AIA Vision® to help the patient understand that the vision program is a protocol designed to help them move more efficiently into and out of a particular hemisphere with minimal effort, which can result in decreased pain.

Vision Prescription Eyewear Orthotic

Initiation of a program for prescription eyewear orthotics begins with the initial evaluation process by the AIA Clinical Movement Specialist (usually a PT) and the Optometrist. This phase of the program cannot begin without a prior eye examination done by a reputable optometrist in the patient’s locality. This complete eye exam (including refraction) must be sent to the AIA Vision® Optometrist for review to

determine if the patient is even appropriate for AIA Vision® evaluation. If there are issues (specific eye diseases, etc) then the AIA Optometrist will make recommendations regarding how to move forward. This assists the patient in understanding exactly why treatment may not be able to be carried out as soon as may have been originally anticipated.

Once the initial examination of vision records is completed and no issues are noted or these ancillary issues are resolved, then the AIA movement specialist and the AIA Optometrist can begin the process of interdisciplinary evaluation. If there are oral appliances involved, it is optimal if the evaluation can take place with the dentist nearby; often, modifications to an oral appliance are needed as the process takes place to ensure all the sensory inputs "match" and the AIA Optometrist is not overtreating the patient. This evaluation begins with reexamination by the AIA movement specialist plotting the client on the SOP® to make certain of their pattern presentation from column 2 (intact left lateralized pattern up to column 5 (intact right lateralized pattern). This initial plot affirms into which hemisphere the AIA Optometrist needs to guide the patient. From there some Sagittal, Transverse and Frontal finding highlights are established and monitored throughout the examination process as well as the patient's observed ability to "Visually Center" into both hemispheres. Once the patient is tested on the exam table, a trial frame of lenses is placed to assist the patient in tri-planar rotation into both hemispheres. During the process, retesting is conducted on the body by the movement specialist. Soon, it will become apparent in which plane of movement the patient is lacking by repeatedly conducting special testing in the aforementioned planes. If, for example, there is a frontal plane deficit noted on the exam table, then the optometrist can pursue the frontal plane via corrective lenses. Eventually, as the lenses applied provide the body with no evidence of lateralized patterning with tests on the exam table, the quality of upright movement is examined via Visual Centering ability. At this stage it is good to reevaluate the oral appliances and shoes to determine if any adjustments or changes are needed. Usually the patient will provide feedback such as: "I'm not hitting on my PADA like I was" or "the ALF feels different (or loose)". Less often do they volunteer information about the feet. This is likely because the feet are not as sensitive as the mouth (a hair can be detected in the mouth but rarely under the foot). A need for changes in the orthotics or shoes may be indicated by visible changes in gait or in once-normal but now problematic special tests. Once the AIA movement specialist, optometrist and dentist are all satisfied that the patient is well-handled in all areas and the patient is "Body-Centric" or "Equilibrated" and can Visually Center their body into both hemispheres, the optometrist will generate a final prescription for "training glasses".

Initiation of the actual vision exercise program begins once the patient fills the eyewear prescription. If no glasses are needed then the program begins without them.

The Actual Program

The focus of the program is to navigate the following four phases (The Four "E's") through repetitive "drills" with the establishment and accomplishment of progressive goals along the way:

1. Engage A) peripheral vision and B) create independence of eye movement from the cranium
2. Encourage dissociation of "self" through the corpus callosum
3. Enhance grounding
4. Enliven the sense of forward locomotion

The goal of a vision program is to help the patient be able to rotate the center of mass into either hemisphere while upright and without the need for glasses.

Pre-Phase One

Directionality Enhancement

It is logical to assume that if a patient is unable to adequately discern left from right, that there may be significant challenges to a vision program. Therefore, differentiation between the two should be addressed. Left and right awareness and directionality confidence can be trained. To sufficiently separate the two sides of the body for motor planning, one must have the ability to integrate movement across midline, differentiate between their R and L sides, and identify R and L visual space. This can be accomplished in a variety of positions and activities like body rolling, bilateral integration, laterality and directionality basics, and all-fours crawling (to revisit developmental patterns that were never fully appreciated early in life). Once a patient is confident of their own left and right sides, the ability to distinguish right and left visual space can and should be addressed through directionality activities. Then the multi-phase vision program can be started. Some examples of Pre-Phase 1 activities and mechanisms for determination of the need for a Pre-Phase 1 program are outlined in The Body and The Sight© course.

Phase 1: A) Engage peripheral vision and B) Create independence of eye movement from the cranium

GOAL: Gain correct appreciation of periphery and separate eye movements from the cranium while able to ground on either side in an upright, static position. Assessed by Visual Centering observation and mat testing, including the OA joint.

Phase 1 is a two-part process that includes: A) Awareness of periphery through stance and contact and B) Independent eye/cranial movement. Training the two in the appropriate order (based on what a patient is good at and what they struggle with) will potentially give rise to an enhancement of the ability to occupy the needed hemisphere.

A) Enhancement of periphery through stance and contact means to take advantage of the available tactile cues that the upper extremities can provide. Upper extremity contact with the hand on a wall or back of a chair or other similar object (even a pole or staff) can aid the patient in appreciating the desired peripheral field of vision[22].
B) Independent eye/cranial movement is an easy concept to understand. We are essentially attempting to train the individual to decrease the powerful drive to use vision for stable posturing (eyes as an overpowering postural device) and increase the freedom of movement of the eyes independent of the cranium.

Both A) and B) are outlined in further detail in the ensuing paragraphs:

Another note as you consider the beginning of a vision program: During transitional moments in gait, the eyes and head should flow freely, following the body or scanning for obstacles or objects of interest. This concept holds true throughout the phases of the vision program but especially during the final phase (forward locomotion). Remember, The eyes and head can not move independently if vision is overutilized for stability during transition (transition is the most unstable phase of gait). Therefore, challenges to stability at the ankle, using a narrow board, and visually, using a mirror, are critical during this phase. Monitor that the neurological sense of grounding at the OA joint is maintained and that Visual Centering can be achieved without re-patterning.

Kim 2016 points out that peripheral vision has a greater effect on body balance than central vision[3]. Vater 2022 points this out nicely with a stairway example (Figure 3). Easy-to-walk stairs, with their predictability, require less focal vision and can be negotiated with greater peripheral vision use. Difficult stairs require more focused vision, upper extremity tension and a reduced pace in order to deal with the irregular nature and slippery conditions etc[2]. Peripheral visual training can be done in Seated, Short-Kneeling, Tall Kneeling, Unilateral Kneeling or Standing. The preference is

standing but the needs of the patient always trump the preference by the clinician. For example, a wheelchair bound patient may not be able to stand, in which case the ischial seats may need to be sensed while in the seated position.

Figure 3

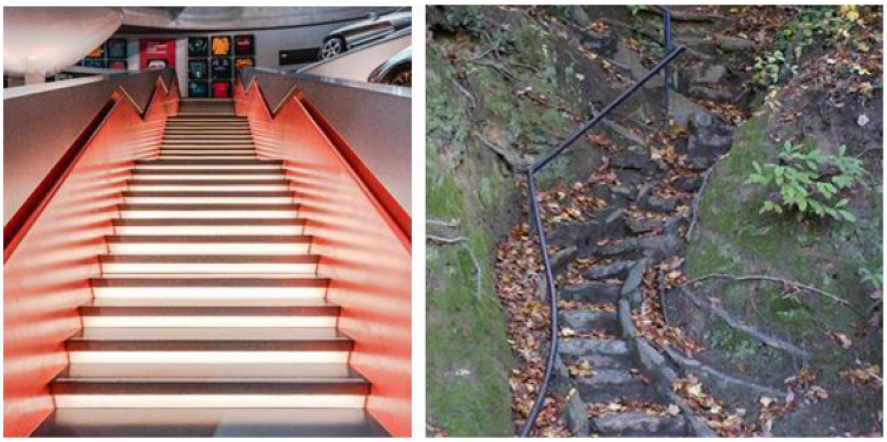


Image taken from: Vater C, Wolfe B, Rosenholtz R. Peripheral vision in real-world tasks: A systematic review. Psychon Bull Rev. 2022 Oct;29(5):1531-1557.

To enhance peripheral vision, the clinical movement specialist will encourage the client to simply be “aware” of the space and objects in their peripheral vision. To achieve appropriate use of peripheral awareness, the correct dominant side must be matched to the phase of the gait cycle. It has been observed that for some patients, being aware of the ipsilateral visual periphery while centering on that side will not only assist in the center of mass shifting, but it will restore a “loose” or “ungrounded” OA joint to the appropriate 10 degrees of motion with a solid “end-feel”. We know that the neurological phenomenon of “Grounding” is needed at the OA joint to be able to fully utilize ground reaction force on the ipsilateral side. While Visual Centering is an effective way to judge the shift of body mass, it is difficult to judge the maintenance of the correct OA joint motion; therefore this measurement must be tested and monitored via mat testing.

The ability to appreciate and use peripheral vision and to keep eyes and head movement independent are intertwined, and a deficit in one skill can create a deficiency in the other. When patients have poor integration of the sense of the space around them, they may use their vision to “anchor” to what they see for stability. Other patients may “anchor” with their vision due to instability, especially in the ankle, neck, and head. This behavior can often be observed as Visual Centering is evaluated; simply notice where they look. If they look at one spot, whether it’s on an object in front of them (including you as the observer), or the floor, they are anchoring themselves with their vision. No matter the reason, they will need to learn how to move the skull independently of the eyes and the eyes independently of the skull while shifted into the appropriate hemisphere based on the Spectrum Of Patterns® (SOP®) evaluation

instrument. This is needed because without independent movement, the skull can continue to pattern into a "strain" (think Side Bend, Lateral Shear, Vertical Shear, Torsion etc). The lack of independent movement increases the use of a "locked gaze" as the primary means of stability for the patient and reduces the brain's appreciation of peripheral space. Lack of independent eye and cranial movement is undesirable. It is similar to independent movement of the tongue and lips or tongue and Jaw/mentalis muscle. Independent & correct movement of the tongue and lips etc is usually managed in Myofunctional Therapy and in this case, independent movement of the eyes from the orbits (eye sockets) is considered at AIA to be the first iteration of what could be known as Eyeofunctional Therapy® for the Extraocular Muscles (EOM's). This promotion of independent movement enhances left and right brain activity and approximation of midline simply by compelling the eyes to cross midline. Keep in mind that individuals with an inability to approximate midline (CVA for example) will exhibit improvement when the eyes are used as a device to "guide" the patient across midline. Peiker, C shows that callosal connections unify visual scenery that is parted in two at the visual midline[19] Independent eye movement can neurologically and physically "unlock" the skull for freedom from "strain". Some of the EOM's (Levator Palpebrae Superioris, Superior Oblique) attach to the sphenoid through a tendinous attachment called the Annulus of Zinn. Some attach to the Frontal Bone (Superior Oblique) and still others attach to the maxilla itself (Inferior Oblique). All of these muscles have a direct influence on movement and position of the sphenoid, anterior cranium and oral cavity/cranium/bite configuration[9]. Additionally, left and right gaze is a movement in the transverse plane, which should complement the body control in that plane to establish Hemispheric Occupancy.

The EOMs also influence control of the OA joint and the position of the cervical vertebrae. Through reflex integration centers in the brain, eye movement directly affects muscle responses of the head and neck [17,18] Through clinical trial, we have noted that in some cases, gaze to the ipsilateral side will restore a loose OA joint to the appropriate 10 degrees of motion. Therefore, gaze should not only be utilized to aid in effectively achieving the neurological phenomenon of grounding at this joint, but it should be ensured that gaze to the contralateral side doesn't compromise one's ability to correctly center their body! Activities for this particular phase of the program are outlined in detail in the The Body and The Sight©.

To progress out of Phase 1, the patient needs to be able to engage the contralateral periphery, initiate contralateral gaze, and initiate ipsilateral head/neck rotation without losing the centered position or grounding at the OA joint. Additionally, they should be able to look either up or down without losing the Centered position. For many, these

gaze directions may be easier than the contralateral periphery/gaze and the ipsilateral head rotation.

Phase Two: Encourage Dissociation of "Self" Through the Corpus Callosum to Train for Bilateral Occupancy

Goal: Enhance the ability to move across midline without loss of body equilibration. Mat tested and confirmed.

This segment of the progression involves programming activities that are mostly done in front of a mirror and experience has shown that these challenges provide the patient with the best opportunity for improvement overall. Buccino 2004 discussed something called the "mirror neuron" in the brain[4]. This mirror neuron (MN) basically is present for movement imitation and stimulus of the MN results in processing of movement more efficiently. Purposeful movement processing can be done through the actual use of a mirror through which the observer can imitate purposeful body movement and enhance repatterning as a result. Carson 2012 pointed out that body movement is greater when done using a mirror[5]. Carson's concept was underscored by Caspers 2010 who demonstrated using Functional MRI and PET scan that both sides of the brain are used when mirror-training purposeful movement[6]. Garry 2005 showed that use of a mirror for training hand movement greatly enhanced same-side excitation[7]. Incorporating the use of a mirror, the voice and hearing simultaneously along with movement of the eyes in the sockets and sockets on the eyes is a way to maximize multiple senses for purposeful movement repatterning through mimicry and direct observation. This segment of the program promotes an ever-increasing challenge for the client as the client stands before a full-length mirror and vocalizes movements and coaches the reflected "other self" on movement. This sort of routine promotes connection between the left brain and the right brain to ultimately increase rotational alternation ability. In addition, the use of a truth mirror or "True Visage" app on a smartphone is also encouraged to promote the same rotational ability without glasses. Experience has shown that this too creates a cross-connection between the left and right brain. Specific Exercises are covered in The Body and the Sight®.

Phase Three: Enhance Grounding

Goal: To be able to load the appropriate lower extremity and then load the opposite lower extremity without loss of body equilibration. Mat tested and confirmed.

The next segment of the program is designed to enhance the sense of ground and should be done in the upright position but can be done in the horizontal position (Lying Down). Upright and lying down activities can also be done simultaneously. It would be recommended to do an upright activity first to engage the appropriate peripheral vision, then perform the horizontal position activity which could include eye movements, and end with an upright activity. In this way, visual periphery is tasked to ensure appropriate integration, while utilizing other positions to facilitate increased grounding. Enhanced grounding has already been taking place in the first two segments of the program but now the program veers definitively toward this necessary ability. If grounding sense has already been gained then this portion of the program will be fast and easy.

In upright or lying down, the focus is on the heel of the foot, chamber compression and ipsilateral occlusal contact with IR of the contralateral palate. Many different activities will be available for this but the big emphasis in the upright is to do these activities with forward and backward movement of the opposite lower extremity and this is not as easily achieved when lying down; however, it can be done. There are seated activities for grounding as well and we are only limited by our imaginations. No matter the position, the theme is for the patient to be able to sense all segments engaging together harmoniously and with as little effort as possible. Remember, we are deprogramming movement; deconstructing a patients' past movement pattern and this takes more thought than brute strength. Activities and goals for this segment are illuminated and refined in The Body and The Sight®.

Phase Four: Enliven the Sense of Forward Locomotion

Goal: When the patient is done with this program they should be reporting good reduction of symptoms and all mat tests should demonstrate an equilibrated state of the body.

The final segment of the program is the most dynamic of all the areas covered and is designed to enrich a patients' ability to:

1. Alternate movement from one hemisphere to the other, physically and visually
2. Perceive optic flow both in front of and beside the patient during movement
3. Perceive and better appreciate the rate of forward locomotion
4. Utilize peripheral vision as a mechanism for proprioception
5. Diminish the need for visual grounding through enhanced afferent motor planning

Forward locomotion in the context of this document is actually the visual consideration of gait training and Cao 2019 demonstrates that walking enhances peripheral visual awareness and vice versa[1]. This is an added bonus to our already existent peripheral visual awareness work. Activities in this segment are centered around both forward and backward movements and also involve activities like “braided gait”, crossover stair ascension and descension and a host of other activities that are detailed in The Body and The Sight®.

It is during this phase of the program that the 3-D nature of periphery is most utilized. Left and right periphery represent transverse and frontal plane influence, while compression of the space in front of you as you move forward should encourage forward progression without over-extension.

In Summary

Each segment of the program takes the client through a progression that requires them to rise to varying challenges that, once accomplished, should reduce the need for eyewear and improve the patients’ ability to successfully rotate into either hemisphere on demand.

In our vision program, it is recommended to plan for 3 interdisciplinary (dentist, optometrist and movement specialist) visits with the patient. This, of course, can be modified per individual need. The first encounter with the patient is used to determine what prescription, if any, the patient may need. The second visit is used to determine if the patient can be stepped down from that same prescription or even remove the glasses altogether. In all likelihood the movement specialist will already suspect the answer to this since the movement specialist will be the one taking the patient through the phases of the vision program. Since the program is designed to reduce or eliminate the need for the training glasses, it stands to reason that the movement specialist will have a pretty good idea if the patient still requires the glasses or not.

Some points of practicality for the movement specialist:

- Much of the advancement of a vision program can be done via zoom.
- Be prepared to see the patient in person as the need arises and forewarn the patient that the need will, indeed, arise.
- The patient can and should be doing any other assigned AIA®, non-vision exercises associated with their program.
- Their training glasses could be used in those non-vision exercises
- Patients “slip through the cracks” very easily in these vision programs so keep close tabs on them and plan-out your visits ahead of time.

- Keep a close watch on their “variables” and always update your notes regarding their exercise activities on each visit (copy, paste and bring forward to current note).

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