OVDRA
Optometric Vision Development & Rehabilitation Association

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  https://www.ovdra.org/page/About_Us
- Consistent with the mission statement of VDR, priority for research will be given, but not limited to the following areas: optometric vision therapy, cognitive rehabilitation, behavioral and developmental vision care, visual impairment, applied cognitive and visual neuroscience, behavioral and developmental pediatrics, occupational and physical therapy, learning and education.
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EDITORIAL

In Appreciation of Reviewers

Leonard J. Press, OD, FAAO, FOVDR
Editor-in-Chief

Serving as a reviewer for our journal is, by and large, a thankless task. Clearly there is satisfaction in a job well done, knowing that one is playing a vital role in contributing to the the literature in our field. However, this unique volunteer job is not as easy it appears on the surface.

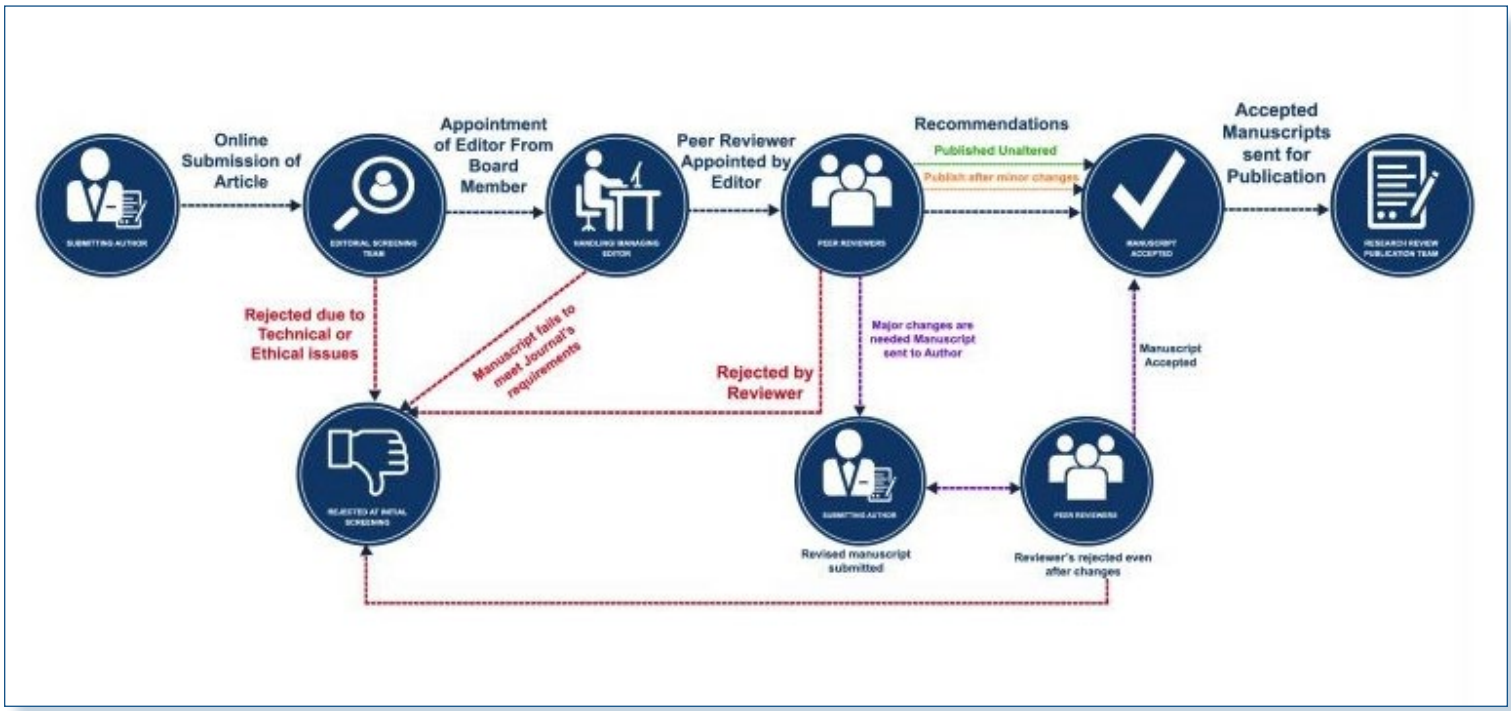
The reviewers serve an anonymous role, in that neither the authors nor the readership of an article knows who served in that capacity. They are invited to review because they are recognized as content experts in the field, but that alone is not enough. The reviewer has to read the manuscript with a critical eye, yet provide feedback to the corresponding author that is constructive and encouraging rather than discouraging.

Functioning as an effective reviewer requires a unique set of skills, and like any aspect of professional development these are skills that can be learned. In that regard, we're particularly appreciative of those who take the time and effort to blend empathy with knowledge. It is actually a form of mentorship and collegiality that ultimately enables authors to be the best that they can be.

In this season of giving thanks, we acknowledge the dedication of those who served in the capacity of reviewers during the calendar year 2025. They helped to make the manuscripts that appear in our journal of high quality, and strengthened the literature in our field. They are listed below in alphabetical order.

If you know these individuals, or encounter them in a meeting, please thank them for serving in the capacity of reviewers for our journal.

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LETTER TO THE EDITOR

In a series of articles published in this journal, Dr. Jeff Berger has done a remarkable job of (a) presenting a model of visual information processing skills (VIPS);[1] (b) demonstrating just how that model can be implemented;[2] and (c) shown—by the use of that model—the efficacy of vision therapy for the treatment of VIPS dysfunctions.[3]

The optometric profession has had gifted clinicians such as A.M. Skeffington, D. B. Harmon, Ann Nichols, G. N. Getman, Baxter Swartwout, Paul Harris, and others too numerous to mention who exhibited extraordinary observational skills, and clinical intuition as well as insight. Try as we might to emulate them, many of us fall short of their levels of subjective skill excellence.

Recognizing the gap between subjective and objective observation and testing, Dr. Harold Solan embarked on a career-long effort in the 1960s to establish norms and standardize various visual processing skills.[4] As valuable as his and comparable efforts were, they have fallen short of a widely adopted, unified model for the optometric profession. In addition, these efforts have largely been restricted to children with learning problems.

It is in this light that the model proposed by Dr. Berger and his colleagues is ground-breaking. Dr. Berger's model is comprehensive, objective, quantitative, and demonstrable. The model provides the information that those among us who are clinicians in the trenches need in order to address a wide range of ages and conditions. It begins to unify the seemingly disparate functions of visual information acquisition (termed "visual efficiency" in some models) and visual information processing.

The graphical presentation of the data that Dr. Berger has shared enables the optometrist in our field to:

- link observations and behaviors to visual conditions
- develop a hierarchy of therapeutic interventions
- develop insight into therapeutic pearls that will enhance and integrate visual acquisition and processing skills
- optimize outcomes and achieve results in an efficient time frame
- communicate meaningfully to parents/patients, teachers, other health care professionals, and intra-professionally.

Other professions have had their visionaries that have developed testing/evaluation programs/models/regimens accepted by their colleagues and other professions. Examples include Tomatis (audiology), Piaget (child development), Luria (neuropsychology), Wechsler (intelligence), and Ayres (OT/PT). The unified test batteries and intervention models helped these professions develop greater cohesiveness, acceptance, and advancement.

It is my hope that Dr. Berger's excellently written articles will provide the impetus for our field to to adopt a more unified optometric model of VIPS, and extend it to populations beyond those with learning disorders. On a final note, although there have been optometrists such as Rosner, Wold, and Richman who have introduced tests that can be categorized under the umbrella of VIPS, Dr. Berger's model still relies heavily on tests developed by non-optometric professionals. Ideally we should be able to develop a standardized, objective model utilizing diagnostic and therapeutic tools by our profession. The important thing, in my view, is that Dr. Berger has developed a model that lends itself to standardization, and is capable of adapting to advancements in knowledge.

— Ron Bateman, OD, FOVDR, FAAO
ronbatemanod@gmail.com

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TRIBUTE

Tributes to Robert Sanet, OD, FOVDR 1947-2025



It is safe to say that for this generation, Robert Sanet was one of the most influential optometrists - if not the most influential optometrist - in our field. He served as the 13th President of the College of Optometrists in Vision Development from 1985-87, following in the footsteps of his mentor Dr. Amorita Treganza, and was intimately involved with all aspects of developmental and rehabilitative optometry.

Shortly before his body was laid to rest in the family cemetery on Long Island, one of our Journal Review Board members Dr. Samantha Slotnick shared a story with his relatives, friends, and colleagues in attendance. Samantha noted that when she decided to pursue fellowship in COVD (now OVDRA), she approached Bob to be her mentor. Before he agreed to take her on in that role, he had a series of questions that he wanted her to answer to his satisfaction so that he knew she was committed to the journey for the sake of personal growth. Perhaps that best encapsulates the seriousness with which Bob viewed his mission, and his determination to bring out the best in other people.

Bob's unparalleled success in inspiring others was reflected in the outpouring of heartfelt messages on social media. In tribute to him, the journal reached out to a cross-section of OVDRA members. What follows is a synthesis of their responses, as well as some sentiments shared on social media. We begin with comments from several certified optometric vision therapists, coordinated by our Journal Review Board member Robert Nurisio, COVT [and see Robert's blog here: https://vtworks.org/2025/12/03/footsteps/]

From Stephanie Erickson, COVT:

"I had the privilege of attending Dr. Sanet's Vision Therapy course in 2023. Dr. Sanet created such a safe and welcoming space for all of us attending his course. Doctors and vision therapists from all over the world gathered together every other month to learn, share and grow together. Dr. Sanet taught us to do the same with our vision therapy patients. He taught us how to create a safe space in our vision therapy clinics by allowing these patients to learn, share, and grow alongside us. Some of my favorite quotes from Dr. Sanet were to 'Speak into your patient's listening, and 'Information is like magic - you give away 100% and you still have 100%. I truly believe that I am a better vision therapist because I got to personally know and learn from Dr. Robert Sanet."

From Erin Jubas, COVT:

"Bob is an inspiration. Yes, is, not was. He continues to motivate and inspire me even with his passing. One of the things I fondly remember when I am feeling overwhelmed is his analogy of the airplanes flying over O'Hare International. During his training seminars in San Diego (we attended the 2008 series), he would often say 'I promise this plane will land!' I am a person to talks quickly, plans in advance and always has a dozen or so irons in multiple fires, and he taught me to trust myself. Sometimes when I am teaching (inspired by Bob to mentor and train vision therapists, and inspired by Linda to join the IECB in 2016), and I feel like it is taking a long time to get to the point, I remember that all those airplanes are where they are supposed to be and I trust myself and know that the right plane will land! I also remember a personal moment

with Bob during a training weekend that we were learning about the Space Fixator. I was a brand new vision therapist … I performed the procedure with Bob at the helm and at the end of it, he gave me a huge compliment and it was whispered, just for me. He leaned in and said 'You have a strong internal metronome'. It was Bob magic. That specific praise at that moment made all of my fears melt away and I felt like I could do anything he asked. He lent me his confidence. It is something I passed on to patients, and now to new and experienced vision therapists. I hear his voice in my head, reminding me to give people space and time to think things through. Let them be the one that learns from the teachable moment, don't take that from them. He has a gift that keeps on giving and it has already withstood the sands of time."

From Jen Rea, COVT:

"Speak into your patient's listening"- Robert Sanet

This one sentence changed my whole thinking about how to treat my patients and how to guide them through their vision therapy journey. Fortunately I heard this saying early on in my vision therapy career so I have applied it to almost all my patients. This sentence reminds me that I need to stay present and know my patient, be listening to their words and actions at all times so that I know what they will listen to and it reminds me to speak to my patient throughout their session, not to just "check out" or "go through the motions". As with so much of the Sanet Course material, this sentence has also changed me personally and my interactions with my loved ones.

Thank you Dr. Sanet for "speaking into my listening".

From Thomas Headline, COVT:

(This goes back to the days prior to the acclaimed Sanet Seminar Series)

"'I remember attending a Regional Clinical Seminar in the office of Dr. V. Lianne Rice in the mid-1990's where Dr. Sanet was lecturing. His passion for vision therapy was inspiring. He presented several VT procedures during this seminar, but one that stood out was when he projected a full wall sized AN Star for Look-Ready-Touch-Back and opened my eyes to what 'periphery' could really be. He has shared his knowledge with countless optometrists and vision therapists around the world. There are even more countless patients who will benefit from his wisdom. He has effected a significant positive change in many people's lives."

From Julie (Jules) Petteruto BA, COVT:

Each time I met with Bob Sanet, my beliefs about vision were challenged; each encounter shaped me as a vision therapist and human. Dr. Sanet's words would ring in my head; 'It's not what the procedure does to the patient, it's what the patient does with the procedure.' 'Arrange the conditions for neurological change.' 'Speak into someone's listening.' As I hear his voice in my head, I am forever changed; I smile, appreciate the privilege to have known him and work harder to use your mind not just your brain'."

From Juliet Machado, COVT:

"As a brand-new vision therapist attending the Sanet seminars, I didn't have a lot of hooks to hang my learning on, but I did understand I needed to start treating my patients as people not just eyeballs, to work towards goals beyond diagnosis in the therapy room, and that I, somehow, had just become "friends" with a giant. Ten years later, with many hooks hanging, I attended the seminar again and Dr. Sanet taught me a lesson that changed my life. After meekly expressing my passion for helping people post injury to him, he advised me, "to speak confidently." This changed my self-perception and propelled me to present at the annual OVDRA meeting on my perspective regarding brain injury care and then gave me the courage to accept a position on the IECB. My passion for VT, and drive for patient advocacy, has been irrevocably fueled by Dr. Sanet's generous giving. I move forward with him by my side as I work to help fulfill his mission of helping 1 million people. His lessons live in all of us and in the countless lives we change along the way. Thank you, Dr Sanet, I hope to continue to make you proud."

Our managing editor Katie Kirschner, MS, CAE coordinated input from several members of OVDRA's International Examination and Certification Board (IECB). They are in a unique position to judge the influence of Bob's mentorship on a widespread scale, yet personalize Bob's influence based on their own interactions with him. Here are their representative responses:

From Dr. Kavita Malhotra:

"Bob was dedicated to growing our developmental optometry community. He spent countless hours as a mentor to many Fellow candidates. When I was Co-chair of the Road to Fellowship committee, I emailed Bob asking if he could mentor a candidate. Bob was already mentoring multiple candidates but took the time to respond and help. Recently during the OVDRA meeting in San Francisco, I asked Bob if he could work with a candidate to prepare them for their Fellowship interview. Even though Bob was in the middle of lecturing, he took the time to work with the candidate to help them pass. Despite everything going on in his life he put their needs first. It was always wonderful catching up with Bob at the annual OVDRA /COVD meetings even if it was just a few minutes in the hallway between classes or in exhibit hall, and of course on the dance floor during the banquet. He transformed the lives of so many people in our profession, and through them the lives of their patients and their families. His legacy is the impact he has had on all our lives and will continue to across the globe."

From Dr. Mehrnaz Green:

"When I think about the people who shaped the direction of my career, Bob Sanet is one of the top people on my list. I think most people assume I ended up in developmental optometry because of Harry [Wachs], but long before that, Bob was the one who quietly set everything in motion. I don't think he ever knew how much influence he had on me … In 2002, I went to my first COVD meeting in Fort Lauderdale. I remember getting on the plane thinking, If I can find some concrete direction—someone who can help me understand how to actually do this—I'll come back home and really begin practicing developmental optometry. And if not, then I'd probably just continue along the path I was already on, like so many of my classmates. I signed up for Bob Sanet's Applied Concepts course, and that ended up being the turning point. I was a brand-new grad, asking what were probably overly simple questions, but Bob never made me feel that way. He answered everything with such patience, kindness, and clarity that it suddenly felt possible to build a different kind of career. With only a few pieces of equipment—all recommended by Bob—I started practicing developmental optometry in a tiny room in one of the offices, which was previously a coat closet. His course didn't just give me concepts; it gave me a way to think, a way to structure an exam, and even a starting point for writing reports. That was the foundation I've been standing on ever since. I've thought many times about how easily things could have gone another way. If I hadn't taken Bob's course, I probably would've come home from Fort Lauderdale with nothing more than a tan and gone right back to the same routine. I doubt I'd have had the confidence to work with Harry Wachs the way I eventually did, or to stay committed to this field for the last twenty-plus years. Bob influenced me in ways I didn't fully understand until much later. Every patient I've helped, every family I've supported, every therapist I've trained, and even the courses I now teach—all of it traces back to that moment when Bob lit the path for me. I will always be grateful for what he gave me, and for the fact that he did it with such generosity and heart.

From Dr. Derek Tong:

(Addressed to Dr. Sanet, in the spirit of him still being here with us)

"I am thankful for your kindness and sharing your knowledge in many big and small ways:

1. As a first year SCCO student in 1994 (over 30 years ago), you drove all the way from San Diego to give a lecture to the SCCO

OEP Club. I learned for the first time that Vision Therapy can help individuals with TBI such as the car accident you suffered.

2. As a SCCO VT resident trained from 1998-1999, you came to have a meeting with Dr. Michael Rouse at the Optometric Center of Fullerton while I was seeing a VT patient and performing the Lowman Beam with Marsden Ball and Metronome. You came by to see what I was doing and gave me a "impressed" smile.

3. As a new COVD Fellow at COVD Miami 2002 (over 20 years ago), I attended the second day of your Applied Concept Course on "Visual Acquisition Problems" and witnessed how you would perform Vision Therapy using the Space-Fixator on one of the participants.

4. From 2013 to about 2023 (you were so gracious in allowing many of my residents to attend the PAVE-Sanet course at a much reduced price. These 19 young optometrists all returned with enthusiasm about Vision Therapy and I am confident that they will apply what they learned from you to help their patients for years to come."

From Dr. Robin Price:

"One of the greatest lessons I learned from Bob was when he said, 'This is the way I do it. But if it's not comfortable for you to do it this way, find something that works for you.' During the first few years after graduating from optometry school, I found myself trying to follow the counsel of many mentors and consultants, trying to be like them. When Bob gave us the freedom to find our own way, it opened up the world for me. I've attached a song I wrote for Bob during his last Sanet Seminar in 2024." (see next page for *"One in a Million"*.)

From COVD Past President, Dr. Neil Draisin:

"Bob was an original member of the VisionHelp Group, and we always looked forward to his ground-breaking information regarding the practice of vision therapy. When he started his year-long course known, as the Sanet Seminars, he chose Charlotte, NC as one of his first sites, I sent our entire staff of ODs and vision therapists to the program … Later on I attended again with a new associate, and it was an amazing experience to see not only how much the information had evolved, but how Bob had grown. Anyone attending the Sanet Seminars raved about how enlightening and transformational it was. All of the externs who rotated through our office were encouraged to take the seminar if they wanted to practice vision therapy at the highest level possible, and many did so. Together with Dr. Glen Steele, we brought Bob to SECO to present on paradigm-shifting approach to strabismus and amblyopia. The first class had about 25 persons in attendance. Word quickly spread during the meeting about what a special presenter Bob was, and by the second class over 125 people were in attendance. The attendees were elated, and it was an honor and privilege to have had him as a friend and colleague."

From COVD Past President, Dr. Daniel Press:

I graduated PCO in 2007 and joined my father (Leonard Press) in his esteemed VT practice in NJ. My father encouraged me to attend the Sanet Seminars to gain a different perspective on developmental/behavioral optometry. I met Bob as a teacher but he quickly became another Optometric father figure (along with Gary Etting and Neil Draisin among others). I showed up to the first seminar in 2008 and carried myself professionally and was careful and guarded with how and when I spoke during the weekend. At the second seminar a few months later Bob and I were talking privately after dinner and he said something along the lines of "Dan, you should not take yourself so seriously. You should loosen up, not be afraid to make mistakes and enjoy the ride." The ensuing conversation allowed me to start to enjoy the work we do at a different level and gave permission to be more bold, not be afraid of making mistakes as they are the best learning tools. Bob was serious about his passion for the work that we do but was

One in a Million

Walking down the beach one day, where all the little children play,
I see a young boy throwing rocks into the sea.
But, as I get closer to where he's playing, I see there are starfish there,
And a million of them washed up on the beach. And I said,

"What's the use in trying to save them? They'll just end up dying, so leave them.
There's no way you can do this all alone." And he said,
"Just because I can't save them all doesn't mean I shouldn't do anything at all,
'Cause it sure made a difference to that one."

It's one in a million, but what if that one were you?
One in a million. What would you have me do?
Yes, I know I cannot do this on my own,
But it sure made a difference to that one.

It took a minute to realize that I needed to look through that young boy's eyes,
and help him with this monumental task.
You won't achieve anything if you never start, but one step at a time, you'll go quite far.
It's by simple things that great things are brought to pass.

It's one in a million, changing one life at a time.
One in a million. And by serving, I've saved mine.
Yes, I know I cannot do this on my own,
But it sure made a difference to that one.

You're one in a million . . .

Dedicated to our maestro, Bob Sanet
With love and gratitude, from Robin Price

also serious about connections with people. That included patients, students, colleagues, hotel staff, etc. It was a lesson that changed my outlook on Optometry and life and will forever be indebted. Bob also asked me if I would wait another year to be elected president of COVD (OVDRA) in 2019 so that he could continue to be the youngest president on record but the board would not let that happen :)

From Dr. Angela Peddle:

Dr. Sanet was the most influential optometrist in my career. He was someone whose guidance shaped not only my clinical foundations but really the deeper purpose that now runs through everything I do - from my seminars, my writing, the way I show up for patients, and even in my relationships. His passion for vision therapy, his belief in human potential, and his ability to see possibility where others saw limits profoundly influenced the direction of my life's work. One of my favourite memories of Bob is what we all affectionately called his "airplanes." Anyone who has heard him speak knows exactly what that means! Bob would launch into these masterful tangents, sometimes three at once, each one circling in its own direction. And yet, in the way only Bob could, he would land every single one of them smoothly, brilliantly, and often at the exact same moment! It was magical to watch him turn storytelling into a teaching art form. I remain deeply grateful for all this airplanes, the light he sparked in me, and the countless ways his legacy continues to uplift practitioners around the world.

The following are select comments, with international representation, from various Facebook posts:

"Hace años, Pilar Vergara dejó todo atrás y se fue a Madrid con una única intención: entender la visión más allá de la vista. En ese camino se cruzó con el Dr. Robert Sanet … y ahí empezó una historia que transformaría su vida. Escucharle por primera vez fue revelador. Pilar no solo comprendió la enorme importancia de la visión en el aprendizaje y el desarrollo, sino que descubrió su vocación docente. Aquel día comenzó una relación de discípula y maestro, que con el tiempo se convirtió también en un lazo humano, profundo, como de padre e hija. Durante 30 años ha aprendido a su lado, ha bebido de su conocimiento, y hoy, como directora del Instituto que fundaron juntos, Pilar quiere compartir esa fuente con nuevas generaciones de optometristas. Porque lo aprendido no se guarda, se transmite. Porque la visión, la que cambia vidas, se entrena, se aprende y se enseña. Y porque los verdaderos maestros forman otros maestros." **— Pilar Vergara**

"Today, the sun in Beijing is warm. Knowing you left peacefully, surrounded by family and love, I realized something: We can choose another way to live—just like you.

To love our families, to keep exploring, to stay grateful, to love the patients around us, and through love and continuous learning, bring transformation to their lives. It was you who awakened behavioral optometry in China. You traveled across our vast land, planting countless seeds of behavioral optometry. Trip after trip to China—Beijing, Shanghai, Guangzhou, Shenzhen, Shenyang, Changsha, Quanzhou …You shared your dream with us—ophthalmologists and vision professionals in China—and it became our dream too." **— Grace Tseng**

"I'm Holli Weaver, and I work with Dr. Lewis out of Boise, Idaho, and I just wanted to take a moment to share with you how deeply you've impacted me and the entire vision therapy community. Your teachings didn't just shape the way I practice. They completely transformed how I see my patients. Without your wisdom, your passion, and your generosity in sharing what you've learned, I would never have truly understood what it means to help someone see. Not just with their eyes, but with their entire being. You've shown us that vision is not just sight, but connection, growth and potential. Because of you, I know how to change lives. And I'm not alone in that. Your influence is what went into the work of so many of us around the world.

Your legacy lives on in every patient we help; every child or adult who learns to read with confidence; every person who regains function after injury. Thank you for showing us what's possible. Not just in vision therapy, but in how to live with purpose, kindness, and curiosity. With all my heart, thank you." **— Holli Weaver**

"We've been watching the Sanet series on Emergent for — man, almost 2 years now! Slowly but surely going through it. Here are some good Bob quotes:

'It's not what the procedure does to the patient, it's what the patient does with the procedure.'

'Arrange conditions so the individual changes their neurology.'

'Speak into someone's listening.'

'When I can change [a person] from someone who runs to someone who sticks with it, that changes them for life.'

'When it takes away from the ability to achieve in life, it takes away life.'

'I don't want the same child with different accommodation, I want a changed child.'

The most important piece of equipment you have in vision therapy is your brain & your creativity.'

'If you don't try, you have zero success.'

*'Vision therapy is not something you do *to* someone, it's something you do *with* someone.'*

Love you forever, Bob." **— Dr. Joanna Carter**

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PERSPECTIVE

Proposed Targeted Clinical Research Protocol for Visual Snow and Its Syndrome

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ABSTRACT

Visual snow (VS) and its more encompassing syndrome (VSS) remain an enigmatic medical condition that the optometrist, and others (e.g., neurologist, ophthalmologist, vision researcher), frequently test. In this paper, we present a new, targeted, diagnostic *clinical research* test protocol for use in these patients. With modification, however, many of the tests can be adapted to the clinical environment. The hope is that it will lead to a better understanding of the condition, and thus more effective therapeutic options.

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Keywords: neuro-optometry, proposed research protocol, vision, visual snow, visual snow syndrome

INTRODUCTION

Visual snow (VS) and its more comprehensive syndrome (VSS) represent a current important, and still enigmatic, medical condition.[1,2] VS was likely first described in 1944 in some patients prescribed digitalis for heart problems,[3] and then basically remained relatively dormant until 1995 when discussed in association with migraine.[4]

VS refers to the perception of a dynamic, pixelated plane overlaying the background visual scene of interest.[1,2] It was reported to be present in 3.7% of the U.K. population.[5] Its more complex syndrome (VSS) was reported to be present in 2.2% of the U.K. population.[5] In addition to the VS, which must be present for at least three continuous months, those diagnosed with VSS must also report at least two of the following four visual problems: palinopsia, photosensitivity, enhanced entoptic imagery, and night vision problems ("nyctalopia"). They typically also report one or more of the following visual and non-visual problems: photopsia, balance difficulty, hyperacusis (i.e., hypersensitivity to certain sounds), phonophobia (i.e., unfounded fear of hearing certain sounds), migraine, tremor, tinnitus, and cutaneous allodynia (i.e., painful hypersensitivity to skin touch). Anxiety is a frequent co-morbid condition.[6] It is binocular, present with eyes open/closed, and thus a brain, not eye, abnormality, and is usually worse under lower illumination. Lastly, a new finding is the high frequency (~60%) of basic binocular/oculomotor problems found in the clinical optometric examination.[7] Related are reports in the clinic of basic reading eye movement deficits,[8,9] and in the laboratory of subtle saccadic deficits and related visual processing problems in this population.[10-12] Thus, these patients manifest a constellation of visual and non-visual dysfunctions and related symptoms.

There are six current therapeutic options.[1,2] Some have been more successful (e.g., chromatic tints, oculomotor/binocular therapy) than others (e.g., medications), and some remain experimental in nature (e.g., visual noise adaptation). Thus, those with VS/VSS presently have several successful and

Table 1: Targeted clinical research tests for sensory deficits in VS/VSS

Test	Purpose	Key Parameters/Tests/Function(s)
Dark Adaptometry	To rule out retinal disease in a quantitative manner	· Quantitative assessment of retinal function
Pattern Electroretinography (pERG)/Multi-focal ERG	To rule out retinal disease by objective means	· Objective measurement of retinal function
Pattern-Reversal Visual-Evoked Potential (VEP)	To assess objectively cortical physiology/integrity	· Low and high contrast patterned stimuli · Square and sine wave patterned stimuli · Range of spatial frequencies and visual field dimensions · Key parameters: N75, P100, N135, latency
Dynamic Pupillometry	To assess objectively the pupillary light reflex pathway (PLR)	· Low and high luminance levels · Short and long stimulus durations · Key parameters: Peak/average constriction/dilation velocities, latency
Photosensitivity	To assess light sensitivity subjectively and quantitatively	· VLSQ-8 questionnaire score · Key parameters: Just noticeable difference (jnd) and bothersome level of light intensity
Critical Flicker Fusion Frequency (CFF)	To assess quantitatively low-level/basic temporal aspects of vision	· Monocular and binocular · Low and high luminance levels · Low and high room illuminations
Contrast Sensitivity Function (CSF)	To assess contrast sensitivity	· Near and distance · Sine wave patterns and low contrast Snellen visual acuity chart · Low and high room illuminations
Night Vision ("nyctalopia")	To assess visual performance in low illumination conditions	· Visual acuity and visual tracking in low room illumination · Night driving simulator testing
Color Vision	To assess for any color vision deficiency.	· To assess how such a deficit might affect visual perception with a chromatic filter · D-15 Test

Table 2: Targeted clinical research tests for motor deficits in VS/VSS

Test	Purpose	Key Parameters/Tests/Function(s)
Vergence and Versional Eye Movements, and Accommodation	To assess basic oculomotor ability objectively	· Key parameters: Latency, peak velocity, amplitude, and steady-state/dynamic errors
Reading Eye Movements	To assess objectively reading oculomotor control and overall reading ability	· Key parameters: Words per minute (wpm), grade level efficiency, progressive saccade rate, regressive saccade rate · Test at and below grade level to distinguish between an oculomotor versus a basic language problem
Anti-Saccade Test	To assess objectively cognitively-conflicting visual information using a motor response	· Objective measurement of cognitive-motor conflict response
Dynamic Posturography/Gait Analysis	To assess objectively balance/postural stability/ambulation	· Eyes open and eyes closed (for posturography) · With and without new refractive correction, yoked prisms, binasal occluders, partial occluders, vergence prisms, vision therapy (if needed)
Simple and Choice Reaction Time (RT)	To assess quantitatively basic visuo-motor ability	· Eye-hand · Eye-foot
Tremor	To assess objectively fine motor integrity of finger/hand	· Objective measurement of fine motor control and steady-state fluctuations

Table 3: Targeted clinical research tests for perceptual deficits in VS/VSS

Test	Purpose	Key Parameters/Tests/Function(s)
Visual Snow	To assess subjectively its presence, characteristics, and quality under different conditions	· Light and dark rooms · Key parameters: Density, dynamics, color · Assess effects on low contrast stimuli, small target detection, with dynamic target changes · Assess quantitatively the absolute perceived distance of visual snow under a range of conditions
Palinopsia	To assess quantitatively its characteristics	· Persistence time of overlapping images and any trailing · Test effects on reading (subjectively/objectively) and different viewing conditions (e.g., room illuminations)
Enhanced Entoptic Imagery	To assess quantitatively dynamic distraction effect on visual performance	· Night driving simulator testing · Gait testing in reduced illumination · Bright white and dark gray background complex visual scenes · Bright white and dark gray plain surfaces (e.g., walls)
Chromatic Filter Test	To assess quantitatively the effect on visual snow and other related phenomena (e.g., palinopsia)	· Intuitive Colorimeter · Various chromatic filters in free space under various conditions (e.g., provocative environment, computer screen)
Draw What One Sees	To assess/confirm the presence of visual snow and related perceptual phenomena	· Subjective assessment of visual perceptions
Visual Attention	To assess basic visual attentional aspects	· VSAT score · Selective and divided attention · With and without visual/auditory distractors · With VEP objectively
Stroop Test	To assess performance subjectively with cognitively-conflicting visual information	· Timed task · Embedded complex stimuli/detailed visual scenes · Low contrast images (e.g., red and green letters/symbols)
Figure-Ground Discrimination	To assess quantitatively the higher-level perceptual disambiguation process	· Timed task · Complex scenes · Low and high contrast visual scenes · With and without visual and auditory distractors
Egocentric Localization	To assess the sense of "straight ahead," which may affect balance/gait/ambulation	· In total darkness · In normal room illumination · With and without yoked prisms, if needed
Visual Motion	To assess visual motion and its aftereffects	· Sensitivity · Threshold · Percent aftereffect
Anxiety	To assess anxiety and how it relates to changes in their perception of visual snow	· GAD–7 Anxiety Questionnaire · Case history correlated changes

likely future beneficial therapeutic options, perhaps performed in combination for more effectiveness.

Proposed Clinical Research Protocol

Of particular importance is the diagnosis, which still remains somewhat ill-defined, and problematic to some medical and non-medical practitioners.[2] Fortunately, there has been recently proposed a detailed clinical diagnostic and treatment protocol for VSS.[8] While a clinical research, diagnostic protocol has also recently been proposed,[1] in the present paper, we provide a more detailed, targeted, and stimulus/condition specific protocol for the clinical researcher, and others (e.g., the advanced neuro-optometrist), to follow (Tables 1-3). They contain both simple and challenging/provocative tasks to assess for both gross and more subtle effects (e.g., tested at low contrast, with visual motion added, while performing dynamic eye tracking) on vision, both subjectively

and objectively. These new tests will likely reveal additional and subtle adverse effects of VS/VSS on vision and higher-level visual processing. The proposed sensory, motor, and perceptual tests are in addition to the basic optometric clinical refraction, binocular assessment, and ocular health evaluation, which serve as the baseline.

CONCLUSIONS

These proposed tests address the wide array of vision and non-vision problems found in this population, and hence performing them will provide important insight the into the condition and its unusual symptoms. Other tests will likely follow as the clinician and clinical researcher, as well as the basic vision researcher, learn more about this puzzling medical condition. This should lead to a greater array of, and better treatment options, for these underserved patients, as they will likely reveal additional new and more subtle effects on basic vision and higher-level visual information processing. Lastly, while all of the tests are proposed for the clinical and basic research laboratory, with modification, many can be adapted to the clinic environment (e.g., reading eye movements, contrast sensitivity, and critical flicker frequency).

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Kenneth J. Ciuffreda received his B.S in biology from Seton Hall University in 1969, his O.D. from the Massachusetts College of Optometry in 1973, and his Ph.D. degree in physiological optics from the University of California/School Optometry at Berkeley in 1977. He has been a faculty member at the SUNY/State College of Optometry in New York City since 1979, where he is presently a Distinguished Teaching Professor Emeritus. He has also had adjunct appointments for many years at Rutgers/The State University of New Jersey, as well as at the New Jersey Institute of Technology, both in the department of biomedical engineering. He also helped establish a school of optometry in Harbin, China. He has conducted research in many areas: amblyopia, strabismus, reading, myopia, eye movements, accommodation, bioengineering applications to optometry, and more recently with an emphasis in the area of acquired brain injury, both the diagnostic and therapeutic aspects. His goal has been the use of objective recording techniques in the diagnosis and treatment of neurological and ocular conditions. He holds two patents, and has received many awards and honors from the AAO, AOA, NORA, COVD, and various state optometric associations and colleges. He has authored over 400 research papers/chapters, and 10 books. His hobbies are playing jazz guitar and enjoying the visual aspects of art.

CASE REPORT

Combining Yoked Prisms and Low Plus Lenses to Improve Function in Pediatric Patients with Convergence Insufficiency

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ABSTRACT

Vision therapy is known to be an effective treatment for convergence insufficiency (CI). However, every patient may not be a candidate for vision therapy due to time constraints, financial means or maturity. Past studies have shown that lenses or prisms alone do not reduce symptoms for patients with CI.[1] In contrast, the literature does show that combining prisms and reading lenses can relieve asthenopia in symptomatic presbyopes.[2] The following three cases outline the use of combined prisms and plus lenses to treat pediatric patients with convergence insufficiency. Due to age or time constraints, these patients were not candidates for weekly in-office therapy. Each patient was examined after two months of full time wear of the glasses. Results show the most improvement in near point of convergence (NPC), stereopsis, and symptoms of diplopia.

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Rajadhyksha S. Combining yoked prisms and low plus lenses to improve function in pediatric patients with convergence insufficiency. Vision Dev & Rehab 2025; 11(4):173-7.

Keywords: convergence insufficiency, plus lens, yoked prisms

BACKGROUND

The primary factor for diagnosing a patient with convergence insufficiency is a reduced near point of convergence, >/= 6cm.[3] Additional criteria include exophoria greater at near than distance by at least 4 prism diopters and reduced positive fusional ranges. Symptoms can include headaches, diplopia, loss of place while reading, and loss of concentration. Based on a randomized multi-center clinical trial, the CITT group concluded that in-office vision therapy (OVT) is more effective than pencil push-ups and placebo orthoptics in reducing symptoms for patients with convergence insufficiency.[4] However, currently there is no well-defined optical protocol for patients who are unable to undergo OVT.

Historically neither prisms nor lenses alone have been shown to be effective in the management of patients with convergence insufficiency. A randomized double-blind clinical trial by Scheiman et.al found that glasses with base in prism alone were no more effective than placebo glasses in reducing the symptoms of pediatric patients with convergence insufficiency.[1] The conventional method of prescribing prism is in a compensatory fashion. Meaning that the prism is oriented to neutralize the horizontal or vertical deviation. Therapeutic yoked prisms are not as commonly used in practice despite their long standing availability. In fact, in the 1950s Bruce Wolf introduced the concept of yoked prisms to the behavioral optometric community. Yoked prisms are prisms of equal power with the bases oriented in the same direction. As opposed to conventional prisms, they are thought to create a "spatial change." Martin Birnbaum described yoked base down prisms to "create an upward spatial shift and consequent upward gaze shift associated with divergence, and increased near point working distance," whereas base-up yoked prisms were "spatially compressive, creating decreased size, decreased distance, downward spatial shift, associated with convergence."[5]

The primary effect of a prism is on vergence with a secondary impact on accommodation whereas the primary effect of a lens is on accommodation with a secondary impact on vergence.

Therefore, a combination of prisms with a plus lens maximizes the outcome. Adding a low plus lens for reading minimizes the stress from accommodation thus further minimizing the stress from convergence.[6,7] Multiple articles have been published that describe the effect of yoked prisms on visual space, posture, and egocentric processing.[8-10,14,15,17-20] Yoked prisms have also become emergent in the management of patients with acquired brain injury and those that suffer from visual neglect.[9,10] A 2009 study by Teitelbaum et. al found that progressive reading lenses with base in prism were more effective for symptomatic presbyopes than progressive lenses without base in prism.[11] A landmark study by Lazarus done in the 1990s found that a combined prism and plus lens prescription was more efficacious in the management of asthenopia symptoms than a plus lens alone.[2]

As noted by Warshowsky in 2019, the combination of vertical yoked prisms and plus lenses can be used to effectively manage binocular vision disorders.[12] He presented a guideline for prescribing yoked base up prisms which ranged from 0.5 prism diopters for pseudo-convergence insufficiency to 3 prism diopters for patients with constant exotropia (Table 1). The amount of prism varied based on body tone, frequency of the deviation and severity of the condition. Dr. Warshowsky also mentions that the preferred method for determining the plus power for reading is via monocular estimated method retinoscopy (MEM) or binocular cross cylinder. A progressive lens design is recommended due to the hour glass nature of progressive lenses, promoting central vs peripheral focus.

Table 1: Guidelines for Prescribing Vertical Yoked Base Up Prisms

Prism	Diagnosis
0.5 BU	Pseudo Convergence Insuffiiency (CI)
1.0 BU	CI without hypotonicity and hyperactivity
2.0 BU	CI with hypotonicity and hyperactivity
2.5 BU	CI with hypotonicity and hyperactivity or Intermittent Exotropia
3.0 BU	Constant Exotropia

Case Series

The following three cases outline the use of combining prisms and plus lenses to treat pediatric patients with convergence insufficiency. Due to age or time limitations these patients were not candidates for weekly in-office therapy.[3]

1. **Patient Y.F:** 5 year old male presented with complaints of fatigue while doing school work, headaches and eye pain while looking into a book.
2. **Patient M.G:** 4 year old male presented with symptoms of double vision and closing an eye. Mom reported that the patient had limited focus and attention, and was clumsy.
3. **Patient J.G:** 6 year old male presented with poor identification skills. The patient was below grade level in reading, was distractible, had low tone and had difficulty following instructions in school.

A comprehensive visual analysis was performed in the entrance examinations of each patient. Table 2 demonstrates the highlighted findings including near point of convergence (NPC), near cover test (NCT), positive fusional ranges at near (PFV), monocular estimated method (MEM), and stereopsis (Stereo). Objective measurements predominated subjective responses due to the level of understanding, development and age of the patients. All three patients were diagnosed with convergence insufficiency based on the CITT criteria.

The first line of treatment for all 3 cases was an optical prescription. We combined yoked base up prisms and a low plus reading lens in a progressive design. The amount of base up prism was derived by observing body tone (level of hypotonicity), frequency of deviation (control score) and severity of the condition as recommended in the Warshowsky guidelines for prescribing vertical yoked prism (Table 1). It is important to note that progressive lenses have ground in base down prism to offset the thickness of the add, therefore in cases with a moderate to high add base up prism would need to be adjusted accordingly. The add for the progressive was derived from MEM

Table 2: Exam Findings

Patient Demographic	Patient Y.F	Patient M.G	Patient J.G
Entrance Exam			
NPC (INCHES)	3/5″	6/12″	8/16″
NCT	6 EXO	IAXT CS 2	10 EXO
PFV	unable	unable	X/12/6
Stereo (WIRT)	200″	70″	30″
MEM	+1.00	+1.00	+0.75
Prescription			
OD, OS	-2.00 OU	+0.50 OU	+1.50-1.0X180 OU
Yoked Prism	2.0 BU	2.5 BU	2.5 BU
Add	+1.00	+1.00	+1.00
2 month Follow-p			
NPC (INCHES)	TTN	4/6″	6/8″
NCT	6 EXO	ortho	6 EXO
PFV	x/26/10	unable	18/12
Stereo (WIRT)	40″	30″	20″
MEM	+1.00	+1.25	+1.25

retinoscopy with the value of the add being at or 0.25 diopters more than the finding. This is to ensure that the patient experiences the complete add power without tilting their head in a low progressive prescription. Glasses were prescribed in progressive form for full-time wear even if there was no distance correction to encourage compliance. Yoked base up prisms were prescribed for the therapeutic goal of improving eye teaming and aiding spatial awareness. Compared to single vision reading glasses, the progressive design provided clarity at all distances thus, the glasses could be comfortably used in school.

Each patient was examined after full time wear of the glasses for two months. Results showed the most improvement in NPC and Stereo (Table 2). Subjective improvement was also reported by the parents and patients. Typically, the first symptom to resolve when present is diplopia. Among other initial examination findings, stereopsis and NPC demonstrated the greatest improvement.

DISCUSSION

Robert Kraskin, an acclaimed practitioner in vision development, once wrote "the base of a prism is academic, the amount is clinical."[13] Yoked prisms are often used in the behavioral optometric community to alter visual space and thus impact behavior and function. However, until now the amount to prescribe has not been explicit. A study by Sheedy and Parsons assessed tolerance of yoked prisms and found that anything above 4 prism diopters had a higher chance of rejection due to a large postural change.[14] Additional studies by Kaplan, Taub and Harris and Shapiro also suggested 1 to 3 prism diopters of yoked prisms for prolonged wear were optimal in vergence dysfunction.[15,16,17]

Recently, yoked prisms have emerged in the management of patients with acquired brain injury and those that suffer from visual neglect. Yoked base up prisms are understood to create a downward spatial shift, decreased size and decreased working distance which is associated with convergence. Response to yoked base up prisms also creates a counter postural shift of the body which improves tone. The center of gravity of the body shifts opposite to the eye movement gaze; as eyes move down towards the apex of the prism, the body shifts upright thus increasing tone.[18] The spatial change and convergence induced by yoked base up prisms promotes egocentric .processing by improving depth perception and solidifying a sense of self in space. Since base-in prisms simply compensate by moving the image laterally, they do not produce any effect to induce convergence and have a reduced range of therapeutic effects. A future study comparing the impact of base in vs. yoked base up prisms in a progressive design is warranted.

Studies have shown that prisms or lenses alone do not provide adequate relief for patients with CI. However, combining prisms with reading lenses has been shown to be effective in the literature. The commonly utilized accommodative convergence ratio (ACA) illustrates that vergence and accommodation are linked in the brain. Therefore, creating a balance between the two systems is optimal for the visual system. The lens design used in our cases were progressive due to their central focusing properties, however anti-fatigue lenses can also be used for patients who need smaller frame sizes. A flat-top bifocal is not advised due to its image jump properties which can be disruptive to spatial awareness.

There are some studies in the literature which seem to refute the application of vertical yoked prisms. Asper et. al looked into the immediate effect of vertical yoked prisms on heterophoria and Schmid et. al studied their direct effect on accommodation and fusional ranges.[19,20] Both studies found no direct correlation of yoked prisms to changes in binocularity. However, there are a few important distinctions with these studies and our methods. First, one of the studies used higher amounts of yoked prisms than suggested in the Warshowsky guidelines. Using smaller units of prism also minimizes reflection and distortion and promotes compliance. Second, both studies looked for immediate results after prism administration only, rather than the 2-month therapeutic time period suggested in our cases with a combined prescription. Finally, both studies were performed on a group of normal pre-presbyopic patients rather than patients with symptomatic convergence insufficiency.

Convergence Insufficiency is prevalent in 5% of school aged kids.[21] Treatment of convergence insufficiency has been shown to have improvement in academic behavior.[22] Since there are many patients who are unable to undergo an extensive OVT program, it is important to consider an optical treatment plan. Previously, these patients may have been overlooked and dismissed. It is important to remember, there is an intermediate step, an optical correction, which can provide symptomatic relief and improve function.

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Dr. Sloan Rajadhyksha graduated at the top of her class from the UC Berkeley School of Optometry. She completed her residency training with specialization in pediatrics, vision therapy, and rehabilitation—all of which she puts into practice at the Beyond Vision Center (BVC) practices in San Diego, CA. Dr. Raja has also received Fellowship recognition for her clinical expertise from the American Academy of Optometry as well as the College of Optometrists in Vision Development. In 2023, she was honored to be named "Young OD of the Year" by the San Diego Optometric Society, an award given to an optometrist who has shown outstanding leadership and dedication to their profession within their first 10 years of practicing.

Before opening BVC, Dr. Raja gained experience working in a high-volume community health clinic, where she cared for children and adults with visual dysfunction. An active member of the optometric community, she currently serves as the president-elect of the San Diego Optometric Society. She continues to develop her field, authoring clinical articles for numerous platforms and giving presentations at the Berkeley College of Optometry, the Optometric Vision Development & Rehabilitation Association, the California Optometric Society, and in her local community. Dr. Raja has worked with an extensive and diverse community of patients. Outside of optometry, Dr. Raja enjoys spending time with her husband, BVC co-owner, Dr. Hunter Morgan, and their son, Wesley. As a family, they are dedicated members of their community and are proud to serve San Diego with three locations of Beyond Vision Center.

CASE REPORT

Driving with Low Vision: Case Report and Bioptic Telescope Guidelines for Fitting and Training

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ABSTRACT

Background

Driving is a form of independence as it affects mobility, employment, and ability to live in a society that relies on automobile transportation. The use of a bioptic telescope for driving has long been a way for low vision patients to retain some independence. Each state has its own vision requirements to determine who is legally fit to drive. Aspects of vision that should be examined include acuity, visual field, and contrast as well as overall fitness to drive. Proper fitting and training with a bioptic telescope increases the patient's success and safety when driving.

Case Reports

A 16 year-old male with achromatopsia presented with the chief complaint of wanting to know if he is eligible to drive in his home state. He was fit with a 4x focusable Galilean bioptic telescope over the right eye and successfully completed in-office training with the device. Visual function was assessed and overall fitness to drive was taken into account.

Conclusion

With proper fitting and training of bioptic telescopes, low vision patients can be successful and safe drivers. Fitting techniques are universal while training techniques can vary. The aim of training is to improve ocular motor speed and accuracy. Once the patient has completed training with the device, it is ultimately up to the patient's state Department of Motor Vehicles to issue the final driver's license. Bioptic telescope use while driving helps low vision patients retain some of their travel independence and thus remains an important aspect of low vision optometry.

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Keywords: driving with low vision, Low vision rehabilitation, telescopic license

BACKGROUND

Difficulty driving is the second most common chief complaint for low vision patients after reading.[1] Driving allows people to travel independently to reach a job, errand, medical appointment, or social engagement. In most parts of the United States, traveling by automobile is the most common, or only available, form of transportation.[2] This is demonstrated by data from 2009 which estimated that 87% of those eligible to drive (age 16 and over) had a driver's license.[3] As the "baby boomer" generation ages, there is a trend showing that drivers are getting older as well. In 1983, the majority of drivers were between the ages of 25 to 29 years old. In 2008, there were two peak age groups, one between 45 to 49 years old and one at age 70 and older.[4] As the population ages, there is an increased risk of reduced visual function among older drivers.[5-8]

Driving is a functional task. Both congenital and age-related eye conditions that cause low vision can impact visual acuity, central and peripheral

visual field, contrast sensitivity, and glare sensitivity. In order to ensure safe and legal driving, the eye care provider needs to thoroughly evaluate each of these areas.

Visual acuity requirements for driving are specified by the state of residence.[9] Many road signs utilize standard shapes and colors, such as the red, hexagonal "stop" sign, and this lessens reliance on central visual acuity. In 1989, Fonda showed that patients with 20/200 acuity and a field greater than 120 degrees could drive just as safely as normal sighted drivers at a speed of no more than 40 miles per hour.[10] Standard Snellen acuity is typically requested by each state's Department of Motor Vehicles (DMV). Central acuity is used to read street and highway signs. There is little to no evidence that drivers with acuity worse than 20/40 are at an increased risk for motor vehicle collisions.[11-16]

It has been shown that visual field is a better predictor of motor vehicle collisions than acuity.[16] Peripheral vision is essential to alert a driver of hazards that are not directly in front of him or her. In situations when a patient has good central acuity but a significantly restricted visual field, patient education becomes important in order to help a patient understand why driving may not be safe. A normal visual field for each eye is as follows: temporal 100 degrees, nasal 60 degrees, superior 60 degrees, inferior 75 degrees.[17] Thirty-four states currently have visual field requirements to obtain an unrestricted license.[9] To test peripheral visual field, the eye care provider can utilize a Goldmann visual field, SSA Test Kinetic screening test on a Humphrey Field Analyzer[a], static Esterman test on the Humphrey Field Analyzer, Kinetic custom testing on the Humphrey Field Analyzer 3,[b] or a Kinetic field on the Haag-Streit Octopus 900;[c] all of these tests examine the widest extent of a patient's peripheral field. The examiner can also plot central, absolute scotomas by customizing the vectors on the Goldmann visual field, Humphrey Field Analyzer 3, and the Octopus 900.[18,19] There are limitations to both the SSA Test Kinetic and the static Esterman. The SSA Test Kinetic does not allow the user to plot central scotomas. The static Esterman is limited to 160 degrees which is not as wide as the kinetic fields, but it may be suitable for assessing driving needs depending on the state's requirements; it also may or may not pick up scotomas depending on the location and size of the scotoma.[20,21] Commonly used visual field tests such as Screening C-20 and N-30 on the Frequency Doubling Technology (FDT)[d] or 30-2, 24-2, and 10-2 on the Humphrey Field Analyzer do not test beyond the central 30 degrees at the most.[22] Some states have binocular visual field requirements, while others have monocular visual field requirements. If a binocular visual field is needed, the practitioner can perform any of the previously mentioned kinetic fields binocularly except for the Goldmann visual field as it is assessed monocularly only. Another option would be to test each eye separately, and then, add the values for the temporal field of each eye together to get a value for horizontal binocular visual field.

Contrast sensitivity is another aspect of visual function that impacts a patient's ability to drive safely. Many studies show that decreased contrast is more predictive than acuity of a motor vehicle collision.[13] While no states currently have a contrast sensitivity requirement, it is important for the eye care provider to understand that reduced contrast sensitivity can negatively impact visual function while driving. Therefore, it is imperative to properly educate patients regarding related test results. A study by Owsley and her colleagues showed that drivers with severe contrast sensitivity impairment are six times more likely than drivers with normal contrast to be in an at-fault crash even when that impairment is present in only one eye.[13] Patients with reduced contrast sensitivity may not understand how it affects their vision. Environmental conditions, such as glare from the sun, cloudy conditions, dim illumination, or inclement weather such as rain or snow can all reduce contrast and make driving difficult for low vision patients. The Pelli Robson and Mars contrast sensitivity tests have been shown to be

the most repeatable[23] and they are also quick and easy tests to perform in office.[24]

Bioptic Telescopes

Dr. William Feinbloom developed the first pair of bioptic telescopic spectacles.[25] It is a dual lens system. Bioptic refers to placement of the telescope, which can be mounted superiorly or inferiorly on a spectacle lens. The spectacle lens is referred to as the carrier lens. The carrier lenses can be plano, in cases where the patient has no distance correction or will be using the spectacles over contact lenses. If indicated, the carrier lenses can incorporate the patient's distance prescription. The patient using this device will view through the carrier lenses most of the time and use the telescope, which should be mounted superiorly in the case of driving, to view street signs or other objects needing finer acuity for identification.[25]

Driving Laws

Eye care providers should be aware of the driving laws in his or her state of practice so that patients can be properly educated. While fitting and training techniques with a bioptic telescope are universal, each state stipulates eligibility requirements for licensure. Over forty out of 50 states in the United States and the District of Columbia allow the use of bioptic telescopes for driving.[26] The eye care provider has the task of determining if a visually impaired patient meets the state requirements to drive with a telescopic license. If the patient is eligible, he or she can be fit with a telescope and trained to use the device effectively. Training is not required by law in each state that allows drivers to use a bioptic telescope for driving. Table 1 summarizes the visual requirements to obtain a driver's license in all 50 states and the District of Columbia in the United States.

CASE REPORT

Patient Y was a 16-year-old Caucasian male diagnosed with achromatopsia. He presented to the clinic, accompanied by his mother, with a chief complaint of determining if he was eligible to be fit with a bioptic telescope for driving as he was eager to obtain a license. He reported significant ocular history of having strabismus surgery on the left eye at the age of 12 to correct an exotropia. He admitted to being photophobic and wore over the counter sunglasses with a dark gray filter to alleviate the photophobia. He denied any current systemic medical conditions or use of medications. He had no allergies. Upon clinician observation, Patient Y was oriented, alert, and able to walk with ease quickly without bumping into peripheral objects.

Patient Y lived in New Jersey. The driving laws in New Jersey state that a driver must have at least 20/50 Snellen visual acuity in at least one eye to be eligible for a driver's license. This acuity can be attained with spectacle correction, without spectacle correction, or with a bioptic telescope. There is no visual field requirement to obtain a driver's license in New Jersey. It is not required by law in New Jersey for a driver to have in-office training with a bioptic telescope before being trained behind the wheel. Color vision testing is only required if the driver cannot pass the visual acuity test at the Department of Motor Vehicles. A driver must be able to distinguish between red, yellow, and green according to New Jersey motor vehicle laws.

Patient Y's entering uncorrected visual acuity taken with the Snellen chart was OD 20/100 and OS 20/100. Trial frame refraction was OD -0.50sph, 20/100 and OS -0.50 - 0.50 x 010, 20/100 and did not subjectively or objectively improve acuity. Given the patient's visual acuity was better than 20/200, he likely has partial achromatopsia.[27]

Contrast sensitivity was tested with the Mars chart;[e] he had moderately reduced contrast sensitivity in each eye (1.28 log units OD and OS). Visual field was tested with the Goldmann Visual Field test and Patient Y had a full field in each eye with a total of 150 degrees of horizontal binocular field. Pupils were normal without an afferent pupillary defect in either eye. Ocular motility testing revealed horizontal pendular nystagmus that dampened 15 degrees in right gaze, as well as a

1+ restriction of the left eye in levoelevation likely from the strabismus surgery he had as a child.

Color vision testing was performed on Patient Y to determine if he met the NJ DMV requirement for distinguishing red, yellow, and green. Patient Y was presented with Edmund Scientific Filters[9] in red, yellow, green and blue. The filters were presented in random order, and Patient Y was able to name all correctly over three consecutive trials. Patient Y was also shown monochromatic LED lights in red (630nm), yellow (592nm), green (525nm) and blue (470nm). The lights were presented in random order, and Patient Y was able to name all correctly over three consecutive trials. Patient Y was able to distinguish between red, yellow, and green colors, and met the NJ DMV color vision requirement. Anterior segment examination was unremarkable in both eyes. Posterior segment exam with dilation was unremarkable in both eyes.

Patient Y was able to achieve 20/20 Snellen visual acuity with a 4x focusable Galilean telescope positioned over the right eye. He was eligible to drive in the state of New Jersey with a bioptic telescope because he was able to achieve a Snellen visual acuity of 20/50 or better with the device. In addition, Patient Y had full visual fields, moderately reduced contrast, and was able to distinguish between red, yellow, and green. He was very motivated and understood the limits of the bioptic telescope for driving.

Patient Y was fit with a custom bioptic telescope and underwent training to learn to appropriately and efficiently use the device while driving. He successfully completed training and the appropriate paperwork for the Department of Motor Vehicles for his home state was completed.

Fitting Process

Fitting techniques are universal. The goal of an ideal fit is to enable the patient to see through the carrier lens when in primary gaze and with a small head movement downward, obtain a full image through the telescope.[28] The telescope is typically fit on one lens only. The eye with the best corrected visual acuity, which is usually the dominant eye, is selected.[29] If acuity is similar or ocular dominance is of concern, the device may be fit binocularly. It is usually best to start with standard manufacturer fitting parameters, however, any of the fitting parameters may be specified.[30,31]

The pieces of information that are required by the manufacturer are the frame specifications, monocular interpupillary distance (IPD), power of the telescope, and prescription in the carrier lens.[30,31]

Manufacturers have various frames that they recommend which are sturdy, metal frames with spring hinges and adjustable nose pads. These frame parameters make it easier to accurately align the telescope for the patient. The patient may wish to choose his or her own frame that is not provided by the manufacturer. When helping the patient choose a frame, it is important to keep the preferred frame parameters in mind to ensure the best fit. The IPD is important so the manufacturer knows where to properly mount the telescope. The mounting angle is the angle between the horizontal plane of the lens to the telescope system. It is usually an angle of 10-15 degrees above the horizontal plane depending on the company used.[30,31] Once again, this can also be a custom value.

Choosing the power of the telescope can be done mathematically. Once the practitioner knows the patient's Snellen visual acuity and the goal acuity, a prediction for the appropriate power can be made. In the case of a bioptic telescope for driving, the goal visual acuity should be the state's driving standard acuity. For example, if the patient has a Snellen distance acuity of 20/80 and wants to drive in a state that requires 20/40 Snellen acuity, the patient would in theory need a 2x telescope. This was found by taking the denominator of the visual acuity and dividing it by the denominator of the goal acuity. This prediction does not always hold true with low vision patients, so it is always necessary to demonstrate the device to confirm the goal distance acuity and adjust the power as necessary. The predicted telescope power is a good starting point. It is best to prescribe the lowest telescope power that achieves the goal acuity. This will allow the patient to have the widest field of view to achieve the desired acuity.[32] If the bioptic

telescope is being fit binocularly, the power of the telescope should be the same in each eye.[30,31]

There are two types of telescopes, Galilean and Keplerian, and a patient can be fit with either type for driving. An advantage of Galilean telescopes is they are smaller and more light-weight. An advantage of Keplerian telescopes is they produce a wider field of view compared to a comparable power Galilean telescope[33] as the exit pupil is closer to the patient's pupil. Bioptic drivers are able to spot with either type of telescope as they are only using the telescope for quick, distance spotting and looking through the carrier 95% of the time.[34] The most common telescope powers used for driving are between 2x and 4x, thus yielding a field of view of less than 20 degrees. Galilean bioptic telescopes typically come in powers of 4x or less, while Keplerian telescopes are available in powers up to 8x.

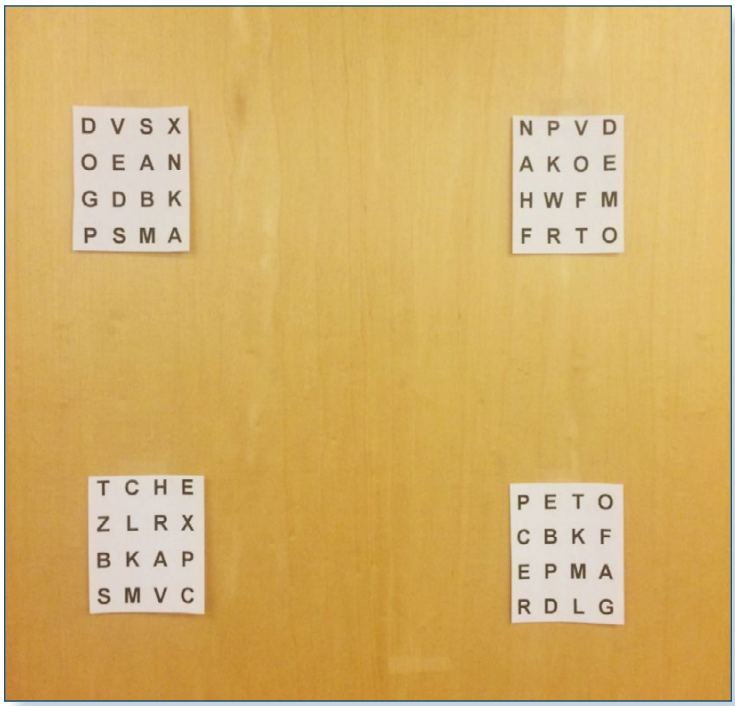
The bioptic may be focusable or fixed-focus. The device must provide a working distance that is appropriate for the activity being performed. In the case of driving, the working distance is optical infinity, thus the device should be fixed focus for optical infinity. Occasionally, the patient may want to be able to use the device for other activities aside from driving such as seeing the board in the classroom or a hobby. In these cases, a focusable bioptic may be more appropriate, but it is important that patients understand the use of the device for each setting.[31]

Patient Y's distance visual acuity was 20/100 in each eye with a goal acuity of 20/50. Therefore, the predicted telescopic power was 2x. He was unable to achieve the goal acuity with a 2x telescope. He just met the goal acuity with a 3x telescope and surpassed the goal acuity with a 4x telescope. After many demonstrations, Patient Y was prescribed a 4x focusable Galilean bioptic telescope over the right eye. He was able to achieve 20/20 Snellen acuity with this device. The need for a stronger telescope than what was predicted was, in part, likely due to Patient Y's moderately reduced contrast sensitivity. Patient Y just met the goal acuity with a 3x telescope, however he was prescribed a 4x telescope because he surpassed the goal acuity with it. This was done because of the need for acuity reserve. Acuity reserve is the ratio of the letter size that a patient wants to be able to read relative to his or her threshold acuity. Reading reserve has been a topic debated over in relation to reading and near tasks however the principles can be applied to distance tasks. It is important for patients to have an appropriate amount of reserve to be able to spot targets faster and with more ease.[35] Latham and Tabrett have found average acuity reserve to be 2 lines to achieve a near maximum reading speed.[36] Reading is a static task, while driving is a kinetic task. Kinetic visual acuity, or dynamic visual acuity, is typically worse than static visual acuity and changes with the speed of an object, thus making the need for reserve that much more important.[37] With a 3x bioptic telescope, Patient Y had no reserve, but with a 4x bioptic telescope, he had 4 lines of reserve. His bioptic telescope was fit monocularly because he had a clear ocular dominance for the right eye and felt most comfortable with the monocular fit when trialed. Right eye ocular dominance for Patient Y was determined using the Miles test, or "hole-in-the-card" test.[38] Patient Y's 4x bioptic telescope was focusable so he can use it for other tasks aside from driving such as watching television or seeing the board at school.

Overview of Training with a Bioptic Telescope

Training is an important aspect of effective bioptic telescope use. Patients require training to learn how to use the bioptic telescope effectively prior to behind the wheel training.[39] While there are standard skills needed for use of a bioptic telescope for driving, there are no standard procedures.[39] New York State Law lists minimum training requirements for bioptic drivers which include the following: locating stationary objects with the telescope using proper positioning and technique, locating a moving object with the telescope using proper technique, remembering what is seen after a brief exposure, practice in a range of levels of illumination, and practice using the device while walking and while sitting as a passenger in a vehicle.[40] A training protocol

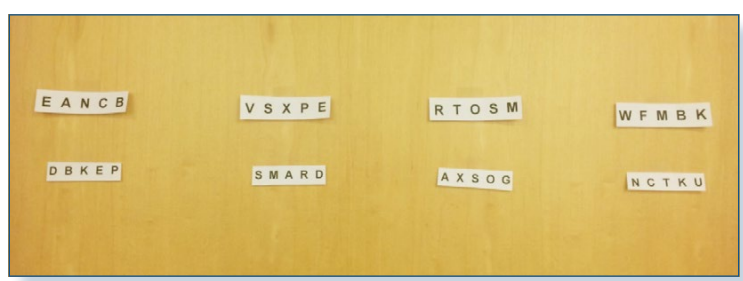
for bioptic drivers was developed by one author (RM) based on these minimum requirements and is used for all patients she trains. This same protocol was used to train Patient Y. The protocol uses vision therapy techniques to develop efficient eye movements to spot through the bioptic telescope quickly while driving and utilizes the same ideas and concepts as oculomotor training for saccades and pursuits, including tracking and scanning. Another protocol using modified vision therapy techniques for eccentric viewing training was also published.[41] In this case, oculomotor skills such as saccades, pursuits, tracking, scanning, and hand-eye coordination were developed using traditional vision therapy techniques with modification of enlarged targets. It is best to work in a step-wise manner starting with simple tasks and gradually increasing difficulty.[42]



Photograph 1. Hart chart set up in four corner pattern for training saccades

Saccades are simple and rapid eye movements in which fixation is quickly changed. Efficient saccades are imperative for driving safely as we use them to quickly move gaze toward a suddenly appearing object.[43] There are various activities to train saccades. Patient Y began saccade training using the carrier lens and the Hart chart. The Hart chart was enlarged by 1.5 times its original size, approximately 6.3M letter size, and then cut into 4 squares of 4 letters by 4 letters. Each square was placed in a 4-corner pattern 1.5 feet apart on a wall (see Photograph 1). Patient Y stood 5-8 feet away from the wall, just far enough that he could still read the letters through the carrier lens of his bioptic. He was instructed to read the first line of letters aloud on the first square, then read the first line of the second square, and so on and so forth until he had read all of the lines on each square. On subsequent weeks, this was made more difficult by having him read the letters on each square letter by letter, and then reading the lines and letters in a vertical pattern instead of horizontal. This is an activity that the patient can take home and practice.

Spotting is a task that must be mastered by the bioptic driver. This task involves localizing an object through the carrier lens, dipping the head down to view through the telescope, and then raising the head to view through the carrier once again. The whole spotting task should be executed within one second or less.[44] This is a difficult task to master when visual clutter and speed of the automobile are taken into account. Patient Y performed a spotting activity that also made use of a Hart chart. The Hart chart was enlarged by 1.5x, approximately 6.3M letter size, and cut such that there were 4 horizontal rows of 5 letters each. Another set of 4 rows was cut with a standard sized Hart chart, approximately 4M letter size, with the same number of letters in each row as the enlarged set. The enlarged rows were placed on a wall with the smaller rows underneath (see Photograph 2). Patient Y stood just far enough away that he was able read the large rows but not the smaller ones through the carrier lens. His task was to read aloud the large row, dip down through the telescope



Photograph 2. Hart chart set up for spotting training

and then read aloud the row in smaller font that is below. The patient continues until he or she has read each set. Patient Y performed this task and each week he improved in speed and accuracy. This task was made more difficult by first timing the patient to ensure he was improving speed further and by varying the number of letters per row so he did not know what to expect. This activity can also be given for home therapy. Another activity that can be done in-office to train spotting is using the Computerized Perceptual Therapy (CPT) tachistoscope.[f] A tachistoscope is a device that displays an image for a certain amount of time before disappearing. The trainer can select the amount of time for which the image is displayed. The patient must be able to spot an object through the carrier, dip down to view through the telescope, and recognize the object before it disappears. This trained speed of recognition. Patient Y sat 5 feet away from the computer monitor. The monitor was set to display a set of three white colored numbers on a blue background for a certain amount of time. Once that time was up, his task was to verbalize the numbers he saw and the test administrator would type them into the computer. The computer would then present another set of numbers. There was a total of ten trials per cycle. After each cycle was over, the computer would tell the administrator the percentage correct. Patient Y started at 4 seconds, and he quickly improved over his 6 training sessions. The goal was to achieve 1-1.5 seconds to minimize time taken off the road. He was able to achieve 1 second with at least 70% accuracy consistently by the end of his training. Per Dr. Groffman, creator of the CPT tachistoscope activity, between 60-70% mastery is considered a good therapeutic level.[45]

It is best to train spotting first in a stationary position, and then while in motion. When in motion, the task is called tracking. It is best to train tracking in a step-wise format: motion of the object only, then motion of the patient only, and then motion of both the object and patient simultaneously.33 Tracking is a valuable task to master when driving; a driver must be able to quickly identify and react to hazardous objects and situations when they



Photograph 3. Rotating disc set up for training tracking

appear.[46] Tracking is trained through the carrier lens. Patient Y was trained using a Keystone rotator.[h] Hart chart letters that were enlarged by 1.5x, approximately 6.3M letter size, were taped to the disc in no specific pattern (see Photograph 3). Patient Y stood 3-5 feet away from the rotator, just far enough away that he could still see the letter through the carrier lens. He was given a dowel stick for tactile reinforcement. The rotator was started at a slow rotating speed, 3-5 rotations per minute. The examiner called out letters and Patient Y's task was to find the letter on the rotator and use the dowel stick to follow it around for two rotations. This activity was repeated for 5 trials. This task can be made more difficult by increasing the rotation speed or having the patient stand on a balance board. Patient Y improved his skills with this task over time.

A driver must have an effective visual scanning technique so he or she is able to see hazards at

a distance and have enough time to react. The previous activity of using the Keystone rotator also incorporated scanning. The patient had to scan to locate the letter that was chosen by the examiner before he or she could follow it with the pointer. Scanning can be incorporated into other activities; it does not have to be trained alone. Visual target look-aways is another activity that incorporated scanning along with spotting. Have the patient locate an object across the room through the telescope, then look away from it, and find it again by scanning through the carrier, and then view it more detail with the telescope again. Continue this for a few cycles. The goal of this activity to get the patient into the pattern of scanning, locating, and then looking away, all eye movements that are used while driving.



Photograph 4. Marsden ball with large letter targets and bunting stick for training hand eye coordination and spatial awareness

Hand eye coordination and spatial awareness are important aspects of driving that can also be incorporated into bioptic telescope training.[47] Patient Y was trained with a Marsden ball[i] and bunting stick that was marked with a bright red line in the center. The patient viewed through the carrier lens for this task. The Marsden ball was adjusted such that it was at the patient's chest level.[48] The patient held the bunting stick on both ends. The Marsden ball should have letters that are large enough for the patient to see through the carrier (see Photograph 4). Patient Y was instructed to follow the ball and call out the letter he was bunting as the ball moved back and forth in free space. He had to bunt each letter with the center red marker on the stick. The goal for the patient should be to maintain control of the ball and bunt at a regular pace with good accuracy. Patient Y improved quickly with this task and showed accurate and controlled movements. Marsden ball vision therapy activities work on spatial awareness and improve both oculomotor control and eye-hand coordination. When driving, the driver will view centrally to make spatial judgements, such as how far away an intersection, traffic signal or pedestrian is from the car. The driver will then need to follow up with an appropriate motor movement such as braking or turning the steering wheel. Patient Y used central viewing to judge depth with the Marsden ball and then followed up with an appropriate motor movement, bunting of the ball. When driving, the driver will vacillate between central and peripheral attention. Though for Patient Y, the Marsden ball activity was a central task, a peripheral aspect could be added, such as having the examiner hold peripheral targets for the patient to identify while bunting. Additionally, motion could be incorporated by having the patient perform the Marsden ball activity on a walking rail.

After in-office sessions, supplemented by home therapy activities, efficiency and accurate oculo-tomotor skills were demonstrated by the patient.

Another task that is beneficial to give the patient as a home activity is to sit as a passenger in a moving vehicle and simulate the driving experience. The patient can practice viewing streetlights, signs, and potential hazards all while still paying attention to the road. Patient Y practiced this often and it helped him realize and appreciate the complexity of driving with low vision. He was taught to adjust the telescope for a far distance object when he sat down in the car to drive. He was instructed not to

focus the telescope while actively driving a motor vehicle.

It is important to note the requirements for licensure for individuals without vision impairments in the state that the patient is trying to get licensed in. Visually impaired individuals may need to meet these same requirements. In New Jersey, a sighted 16 year old needs to complete a minimum of 6 hours of formal driving instruction with a licensed driving school before obtaining a permit.[49] While Patient Y obtained his permit in 2015, New Jersey has a new law implemented in 2025 requiring permit holders under the age of 21 to complete 50 hours of driving practice, including 10 hours at night, before they can obtain a probationary driver's license.[49] For visually impaired patients using a bioptic telescope, there are special options for learning to drive behind the wheel. A certified driver's rehabilitation specialist (CDRS) conducts this certified driver's rehabilitation training.

DISCUSSION

The above case report discussed recommended fitting techniques and sample in-office and home training exercises that can be used for patients who meet the eligibility requirements for driving with a bioptic telescope.

Before fitting and training can commence, the patient must be evaluated for overall fitness to drive. In addition to the visual acuity and visual field requirements by the state, ocular dominance, cognition, and overall health should be considered.

In addition to visual demands for driving, cognition and overall physical health should be considered. It has been shown that those with dementia, Alzheimer's, seizure disorders, and sleep disorders are all considered at risk drivers.[50] Though this is out of the realm of practice for optometrists, it is appropriate to refer patients to primary care physicians, neurologists, psychiatrists and other needed specialists for evaluation.

The patient should have realistic goals when a bioptic telescope is prescribed for driving. Careful and thoughtful patient education is needed. It should include aspects such as cost, training time, and what to expect after being fit with the device including how to obtain a license for driving. The patient needs to understand indications and limitations of the device he or she is being prescribed. The patient should also show enthusiasm and the desire to use the device to be able to drive again. The patient should show promising dexterity when the device is first demonstrated meaning he or she should be able to spot targets with minimal direction and improve with practice.[31]

The patient should understand the limitations of the bioptic telescope while driving. The device magnifies an image thus making it more discernable. However, it also minimizes the field of view, can distort the image, make objects appear much closer than they are, and cause visual confusion concerning the depth of field.[51]

Training is essential when prescribing a bioptic telescope for driving to ensure the patient can safely and efficiently use the device for its intended purpose. Training has been proven to increase performance success.[52-54] Various specialists can do the training, including but not limited to low vision specialists, visual rehabilitation specialists, occupational therapists, and certified driving rehabilitation specialists.[55] Overall, the patient must be able to do the following tasks efficiently with the bioptic telescope: being stationary viewing a stationary object, being stationary and viewing a moving object, being in motion viewing a stationary object, and being in motion viewing an object in motion. Proper training will address each of the aforementioned skills.

Cessation of training is ultimately at the doctor's discretion. It is appropriate to end training when that patient has shown that saccades, spotting, tracking, and scanning can be completed accurately and efficiently and when he or she has met the goal of spotting through the telescope in one second with good accuracy.

Once fit with the bioptic telescope and properly trained, the DMV in each state has a different protocol that must be followed to properly license a driver using a bioptic telescope. In New Jersey, the DMV requires that a physician, ophthalmologist, or optometrist complete a medical eye report. This report allows the DMV to know that the driver meets

the state's vision requirements. This eye report was filled out for Patient Y, and he underwent behind-the-wheel training with his bioptic telescope. He successfully completed this training and is practicing driving until he is ready to take the final road test administered by the DMV in his home state.

The use of bioptic telescopes when driving has presented itself to be controversial in terms of safety. There are conflicting results from the studies done comparing crash rates of drivers with bioptic telescopes to those without. Most of these studies are old and done 20-40 years ago. One of the more recent studies was done in California in 1996, showing that bioptic drivers had a lower rate of traffic citations than the general population.[56] Another more recent study by Vincent et al performed in 2012 showed driving with a bioptic telescopes does not increase one's chance at being in a motor vehicle collision.[57] However, there have been a number of studies in between that have shown the opposite, that bioptic telescope drivers are more prone to motor vehicle accidents than drivers without vision impairment.[58,11] While these studies give conflicting results, it is agreed upon in literature that drivers with impaired vision tend to drive less and in familiar surroundings, thus limiting themselves and exercising more caution on the road than a driver with normal vision.[58,59] The only conclusion that can be drawn is that more research needs to be done concerning safety of driving with a bioptic telescope.

Driving with low vision is a legal issue. Eye care providers have a duty to protect both patients and the public. Failure to warn patients about their ocular conditions and effects on driving is the doctor's liability. The Health Insurance Portability and Accountability Act (HIPAA) does not always protect practitioners from being held liable for not reporting an unsafe driver to the DMV. Each practitioner should understand the laws in his or her own state. Ultimately, the doctor's chart and patient record is the legal document, so it is crucial to make sure medical records reflect what was spoken about in the exam room.[60]

CONCLUSION

The use of a bioptic telescope for driving has been shown to meet the needs of a majority of its users.[61] Bioptic telescope fitting and training for use while driving helps these patients retain some of their travel independence and thus remains an important aspect of low vision optometry.

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SOURCE LIST

a. Humphrey Field Analyzer, Carl Zeiss Meditec Inc., 5160 Hacienda Dr., Dublin, California 94568
b. Humphrey Field Analyzer 3, Carl Zeiss Meditec Inc., 5160 Hacienda Dr., Dublin, California 94568
c. Haag-Streit Octopus 900, Haag-Streit UK, Unit C, Woodside Industrial Estate, Dunmow Road, Bishop's Stortford, Hertfordshire, CM23 5RG
d. Frequency Doubling Technology (FDT), Carl Zeiss Meditec Inc., 5160 Hacienda Dr., Dublin, California 94568
e. The Mars Letter Contrast Sensitivity Test, The Mars Perceptrix Corporation, 49 Valley View Road, Chappaqua, NY 10514-2523, 914-239-3526
f. Computerized Perceptual Therapy (CPT) Tachistoscope, HTS Inc., 6788 S King Ranch Rd, Suite 4, Golden Canyon, AZ 85118
g. Edmund Scientific Filters, Edmund Optics Inc., 101 East Gloucester Pike, Barrington, NJ 08007
h. Keystone Rotator, Bernell Corporation, Division of Vision Training Products, Inc., 4016 N. Home Street, Mishawaka, IN 46545
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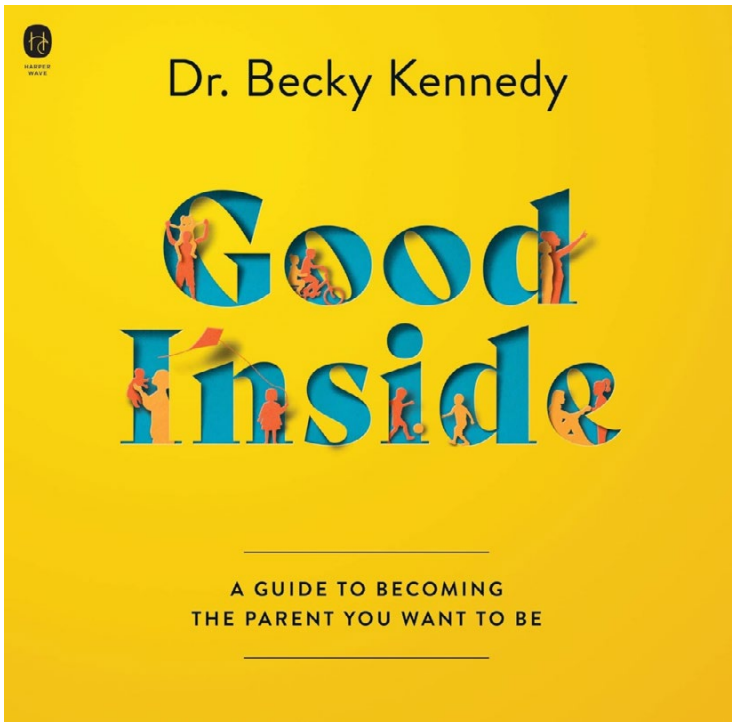
Dr. Sukhija formerly served as the Coordinator of Low Vision Services at the New York Eye and Ear Infirmary of Mount Sinai. She is from Los Angeles, California.

BOOK REVIEW

Good Inside – A Guide to Becoming the Parent You Want to Be

Author: Dr. Becky Kennedy
Format: Hardcover, 336 pages; Paperback 264 pages; Kindle or audiobook
Language: English
Publisher: HarperCollins; 2022
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Reviewed by:
Amanda Whaling, R.Kin, PVT, COVT



Dr. Becky Kennedy is a Clinical Psychologist and mom based in New York City who has been named "the Millennial Parenting Whisperer" by TIME Magazine. Her parenting expertise prioritizes connection over behaviour correction. Although this book is written as a parenting guide, the principles Dr. Becky highlights in *Good Inside* can be applied to a variety of relationship types, including therapeutic relationships with patients/clients of all ages. The concepts that she presents in this book have a lot of overlap with the work done in Vision Therapy. As a vision therapist, reading this book has allowed me to self-reflect (as both a person and a vision therapist), and has given me new perspectives to consider.

This book is incredibly relatable and easy to read. It is written in 2 parts; Part 1 dives into Dr. Becky's Parenting Principles, while Part 2 dives into Building Connection and Addressing Behaviours. Throughout both Part 1 and Part 2 Dr. Becky conveys her methodology with a plethora of real-world examples, while also highlighting more traditional parenting approaches/responses that we may have experienced ourselves as kids or done as parents, which allows for plenty of connection and self-reflection for the reader along the way.

Part 1: Dr. Becky's Parenting Principles

The following are just a few of the main principles that Dr. Becky highlights in the first part of her book that I think are highly enmeshed with the work that we do within Vision Therapy.

Behaviour is a Window: The foundation of Dr. Becky's approach is viewing all people as *Good Inside*, regardless of what their behaviours manifest as on the outside. By viewing behaviour as a window into a person's internal struggle, unmet needs, etc. one is better able to dissociate the (bad) behaviours from the (good) person (experiencing big feelings). This mindset allows for less reactivity in the form of frustration and/or anger, but rather spark curiosity and connection instead. She describes behaviour as never being "the full picture", but rather just a fraction of the bigger picture that needs to be addressed – it's just the tip of the iceberg.

This mindset/outlook is something that I feel the Vision Therapy community embodies quite well, especially when I think about the Learning-Related Visual Problems cases that come through our doors so often. These kids are often labelled as class clowns or disruptive kids, who are outwardly exhibiting poor behaviours or big emotions around school, and sometimes it isn't until they sit in a vision therapy Optometrist's chair that they finally feel seen and heard because their behaviours can be explained (at least partially) by visual struggles,

and finally being offered an approachable solution to help.

Two Things Are True: Dr. Becky highlights the importance of being able to accept multiple realities at once as a critical component to healthy relationships. Being able to see things from another person's perspective and accept it as their truth, regardless of how it aligns with yours, is a vital component to productive communication within any kind of relationship. Shutting down someone's perspective as "wrong" because it doesn't align with yours, is an instant way to shut down openness and connection within that conversation and/or relationship.

This concept is absolutely something that we address on a daily basis in the vision therapy room in so many ways.

If we think just in terms of the very basics of vision – the majority of us have 2 seeing eyes, each with their own slightly different perspective and our brain is constantly processing these 2 views, finding commonalities and differences, to create our visual perception – so when it comes to vision, our brain is constantly juggling this concept of 2 things are true. When reflecting on this concept, I can't help but think of our clients with amblyopia and/or strabismus, where their visual system is actively trying to avoid seeing 2 perspectives. As vision therapists, we are constantly trying to provide safe opportunities for these clients to experience this second viewpoint and learn that it can be just as "right" as the perspective they are used to.

This also had me thinking about the concept of SILO – our lived experience is that as things come closer to us, they appear bigger in size, yet when someone experiences SILO in the vision therapy room with lenses or vergence exercises it challenges that belief. Once they are able to open themselves up to the possibility of this other visual experience, their depth perception really has the chance to flourish.

Resilience > Happiness: Dr. Becky defines resilience as "our ability to experience a wide range of emotions and still feel like ourselves". She indicates that when our emphasis is placed more on maintaining a person's happiness, we often take the opportunity to learn/grow/reflect away from them because we tend to quickly jump in and solve their problems for them instead of allowing them to work through the struggle/discomfort and solve their problems on their own (e.g. "lawn mower parenting"). A good vision therapy program will not only help build visual resilience, but emotional resilience as we help them work through their visual discomforts (and the emotions that come with it).

Reduce Shame, Increase Connection: Dr. Becky's discussion around shame was very eye-opening. She describes shame as "this part of me is not connectable - no one wants to know or be with this part." She highlights that shame encourages us to retreat from others; enter not fight or flight, but rather freeze to avoid further distress; it may present as indifference, numbness, ignoring types of behaviours; reflection and learning are not something one is capable of tapping into when shame is present. Upon reading this chapter, I couldn't help but reflect on how often these shame-related behaviours tend to initially show up in patients with learning-related vision problems, as well as post-concussion. However, once a connection is established, how quickly these behaviours can start to melt away (and how quickly their progress then starts to pick up).

Part 2: Building Connection and Addressing Behaviours

In this portion of the book, Dr. Becky takes her foundational principles discussed in Part 1, and applies them to common behaviours with accompanying strategies as well as realistic scenarios. Here are just a few that really resonated with my experience as a vision therapist.

Building Connection Capital: I love the way that Dr. Becky describes this concept. She describes everyone as having an **Emotional bank account,** where the currency is a sense of connection, and our behaviour at any given time is a direct reflection of how full (or empty) the account is. Anything that someone asks of us that is hard for us to do, or that we really would rather not have to do, depletes this account quickly. So, it is incredibly important that we strive to build as much connection as possible

with someone when we are going to be asking them to do hard things, in order to have as full of an account as possible to work with.

In the vision therapy room, this couldn't be more true. As vision therapists, we are constantly asking our clients (children and adults alike) to work through a program with us where each exercise isn't guaranteed to be easy right away. This requires a lot of vulnerability and trust, and if we don't build connection with them in each session, it is going to be that much harder to help them create the positive change they are hoping for. This is why it is so important to have conversations to find out their goals/likes/dislikes/hobbies, etc. and finding ways to incorporate this into the exercises throughout the program – whether it is incorporating favourite colours, characters, simply taking the time to relate the exercises to real world scenarios and/or their goals, or even revisiting a favourite exercise (even though they don't necessarily need to work on it anymore) to allow for a sense of comfort and ease.

Frustration Intolerance: I really like the way that Dr. Becky frames frustration tolerance. She highlights:

- the more we embrace not knowing/mistakes/struggles, the more we set the stage for growth/success/achievement
- The more someone can tolerate frustration, the longer they can stick with a hard task, stay engaged, manage disappointments, communicate effectively with people who have differing opinions, and sticking with personal goals

It all ties back to resilience. Building frustration tolerance is just one more element of building resilience. A key point that she makes with this is that when helping someone build frustration tolerance, we have to be able to tolerate their frustration. This requires us to show up calm, regulated, patient, etc. I think this can sometimes be easier for the vision therapist than the parents, and this may be something that impacts the compliance of vision therapy home exercises. It is important as the therapist to find that balancing point of giving home exercises that are challenging/frustrating, yet motivating.

Building Confidence: Dr. Becky describes confidence as: our ability to feel at home with ourselves in the widest range of feelings possible, and it is built from the belief that it's okay to be who you are no matter what you are feeling. She also emphasizes that when building confidence, it is not only about what we say when things go "wrong", but also about what we say when things go "right" – highlighting the importance of internal validation and not building a reliance on external validation. This is why it is so important to ask open-ended questions, prompting self-reflection within our vision therapy sessions.

Perfectionism: Dr. Becky describes perfectionism as the mismatch between what a person wanted to happen and what actually happened. People struggling with perfectionism have a very fragile, narrow range in which they feel happy and safe with themselves, leaving them prone to rigidity and a tendency for extremes to their moods and reactions (including emotional shutdown). Most people would view these behavioral responses as being stubborn, but Dr. Becky argues that it is because they actually can't access good feelings about themselves at that moment. With perfectionism, Dr. Becky highlights that behaviour/outcome is strongly linked to their sense of identity, often stealing a person's ability to feel good in the process of learning because, for them, their perceived goodness only comes from successful outcomes. Why try something new unless you know you are going to succeed at it right away?

Just like "looking hard", perfectionism is all about the details. But also like looking hard, there is a time and a place where perfectionism is helpful. We don't want to shut this behaviour down, but rather build awareness so that they can try to not allow it to take control in the moments when they need the softness instead – finding the balance between hard and soft/focal and ambient is so important.

Overall, *Good Inside* is a valuable resource for Optometrists, vision therapists, and parents alike. Dr. Becky did a great job at creating comprehensive, relatable material with actionable solutions for anyone looking to gain insight into navigating some difficult behaviours with sturdy leadership that allows all parties to feel safe, seen, and heard.

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