

Article ▶ Functional Vision Problems Masquerading as Ocular Pathology

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ABSTRACT

Patients often present with symptoms that typically fall under the heading of pathology. Complaints of dry eye, blepharitis, apparent allergic reactions, and the like are usually treated medically with drops, ointments, punctal plugs, etc. The percentage of such cases in which these signs and symptoms are of a functional nature is unknown. Visual stress and functional deficits – eye movement, binocular, and/or accommodative type issues – can result in all the typical signs and symptoms with which we are familiar. Patients respond very well to proper lens therapy and active vision therapy when this is the case. We should be aware that many conditions appearing on the surface to be simply physiological in nature may in fact be the result of functional vision deficits. These often respond to non-invasive treatment, with the added benefit of all the improvement in visual function and comfort that emerge from proper lenses and vision therapy.

Keywords: causes, lens therapy, ocular pathology, symptoms, vision therapy

Introduction

The following case reports involve individuals who presented for care wearing compensating lenses prescribed by various eye care specialists. Two common threads quickly became obvious. Each had been experiencing some level of difficulty or discomfort with some aspect of their vision, as well as presenting with physical complaints such as itching, burning eyes, eye pain, eye twitches, dry eye, and even what appeared to be an allergic reaction to contact lenses and/or solutions. They all experienced immediate relief of symptoms from conditions usually considered to be strictly physiological (and in no way functional) in nature once their habitual lenses were removed and replaced with those derived from a behavioral perspective. These individuals either had been or would have been treated for their symptoms with medications and/or medical devices by most eye care professionals. The causes of these conditions would have remained undiscovered and untreated, in all likelihood.

These cases demonstrate the importance of more creative strategies, resulting in better outcomes, and may be indicative of a larger problem for many suffering patients. I have specifically chosen to use the term “eye care” as distinguished from “vision care.” It is my feeling that most providers of ophthalmic lenses are prescribing based simply on an optical/eyeball/acuity model. Such lenses are prescribed to *correct* faulty eyesight and typically do nothing of the kind. It is more accurate to think of these lenses as *compensating* lenses, not corrective. Such lenses merely mask a symptom, decreased acuity, and often cause more problems than they solve. The missing ingredients in this approach are the person wearing the lenses and the totality of their visual profiles and needs.

Certainly, there are some constants in prescribing compensating lenses. We can be fairly certain that a concave lens will improve distance foveal acuity for someone who is nearsighted, though even this is not guaranteed. However, we cannot always be certain that the particular lens power arrived at during a brief exam is the only one that will do the job.

There is almost always some range of lens powers that will allow for the level of acuity we expect of an individual. More importantly, there is no guarantee that the lenses providing maximum acuity will also provide maximum comfort. Compensating lenses often have unwanted side effects: some obvious, some less so. For example, an all-too-common side effect of wearing concave lenses is the repeated need for stronger lenses to achieve similar acuity over time. Most standard eye examinations pay little, if any, attention to changes in spatial perception, peripheral awareness, physical and functional stress, and overall visual efficiency. Most doctors appear to be content to manage distance visual acuity for their patients with compensatory strategies.

Three of the patients being presented had long histories of interaction within the optometric profession; all three started out wearing glasses and went on to use contact lenses. They had all been examined periodically, with varying levels of satisfaction over the years. The fourth patient had never worn lenses of any kind. It would be safe to assume that the sole purpose of their examinations was to establish maximum monocular distance acuity with compensating lenses. At some point, they determined that the care they were receiving was not adequately solving their problems. Actually, that may not be entirely accurate. At some point, they resigned themselves to the situation as it was. They either decided that there was nothing else that could be done, since this is the ultimate message they received, or else they just gave up on their contact lenses. It was only once they learned that there was another option that they decided to take action. I am certain that there are countless cases just like these in practices everywhere; I only selected a few of the many that I have seen. These four individuals had what would typically be seen as ocular pathology requiring medical intervention. After all, that was the chief complaint at our initial meeting. This type of complaint should be a very simple matter for the medically oriented eye care professional of today. Yet, here are four individuals who fell through the cracks, not unlike

so many with visually based learning problems who only stumble upon behavioral optometry through serendipity.

The approach I used in these cases was not exotic, at least not to me. It merely took into account more complete visual profiles and the actual daily activities and needs of the people requiring lenses. If the medical model of eye care affords the highest level of care available, why did these people continue to have these complaints? It seems that optometry has moved forward in some ways, while continuing to ignore basic concepts that are part of the profession's foundation and heritage. I am referring to the importance of visual development, vision therapy, and prescribing lenses with a therapeutic intent, not simply as a crutch or compensation. Focusing solely on having someone read the bottom line on the distance chart is not always the best that can be done for that person. This is especially true as people spend more and more time doing biologically disagreeable, culturally persistent near work.

If optometrists wish to continue as the leading experts in lens prescribing, the purposes and thinking behind prescribing lenses must broaden. The most notable way in which lens prescribing has evolved recently is with the introduction of even more focus on lens technology for greater acuity and more technology for testing: more devices doing more of the work previously done by skilled practitioners. As far as I am aware, this has done nothing to address the issues raised here. It is my opinion that if the same old philosophy is used in conjunction with this new technology, the problem can only worsen. There are examples of this very issue within medicine, where practitioners rely too heavily on the data provided by machines rather than their own observations and clinical judgment.

While it takes a trained and thoughtful observer to make the kinds of decisions necessary to provide optimal lens therapy, the ability to do this requires little more than a desire to do so. Although it might be possible for machines to make better decisions, this would require that they be designed with a broader philosophy in mind. This is certainly not the case. These machines are designed to determine a refractive end-point and nothing more. They cannot, at this point, discern the subtle nuances that can be seen with the retinoscope. Such nuances provide a wealth of information about many aspects of the visual process. We, as doctors, must realize that there is rarely a single specific refractive end-point. There is almost always a range of possibilities, even if the only issue is acuity. The absence of such a range is an issue in itself. Maximum monocular distance acuity should not be the only, or even the primary, purpose of prescribing lenses, but this is where we remain today.

The two eyes must function as a single integrated unit that is little more than the entryway into the visual process. It is time to move beyond simply prescribing a compensating lens for each eye (as though they were separate entities). It is a good idea, whenever possible, to attempt to offer a

prescription that provides equal transformations of the incoming light for both eyes: that is, equal lenses in front of both eyes (or as close to this as is reasonable). It is also time to think about how lenses are actually being used for daily activities in order to prescribe in a way that maximizes comfort, performance, and development rather than masking symptoms. I would like to see us get away from the eyeball/acuity concept and become more cognizant of the way lenses affect the whole person. Each eye is an input channel, providing one side of the story. For two-eyed individuals, both inputs are important to provide a more complete version of the visual world. However, the whole is surely greater than the sum of its parts. We must consider the importance of the distribution of light impinging on the brain, starting at the retina, as opposed to the simple idea of a finely focused image on each fovea. With this in mind, it might be best to consider lens therapy (compensating or otherwise) as placing one big lens in front of the dual-input optical mechanism to modify the distribution of light with the greatest possible symmetry. This is obviously impractical, but the idea is that this is a better way of using lenses to stimulate the visual process as a whole. Granted, there are circumstances where this is more difficult to achieve and some where it is impossible or impractical. However, even in these cases, it would be best to keep the concept of symmetry in mind, trying to provide the most symmetric prescription possible. This approach works best when vision therapy is involved in the treatment but is often helpful without vision therapy. This type of prescription should be seen as a means to an end and not necessarily an end unto itself. It is also important to consider that providing lenses is always a negotiation between doctor and patient.

This raises another issue that surfaced while attending to the functional visual needs of my patients. There have been numerous indications that full distance acuity, for those who cannot achieve it without compensating lenses, can interfere with the level of overall visual performance, and in some cases physical comfort. This is especially true when single-vision, concave lenses are being worn for all distances and activities, as is usually the case with the pre-presbyopic population. The degree and speed of improvement achieved through vision therapy and/or lens therapy have been greater in patients with whom distance acuity was not held so sacred. Maximum monocular distance visual acuity achieved by means of an external device can create rigidity in the visual process that can impede any attempt at change. It has been my experience, in almost all training and lens therapy cases, that people often achieve improved distance acuity with a reduced prescription. The latter effect was not one that was initially expected or attempted. It only surfaced as a result of follow-up evaluations in vision therapy cases.

It may be that visual acuity is not the beginning of the visual process, but more of an end result. Perceptual "crowding" experienced by young children and those with amblyopia is a good example of this phenomenon. Most

Table 1: Examination data from Elizabeth

Current Rx	OD -3.00-1.25x005 (20/15) OS -3.00-1.50x175 (20/15) (20/15 OU)
Keratometry	OD -1.12x180 AM 45.00 OS -1.12x180 AM 45.00
All testing done with current spectacles	
Near VA	OU 20/20; OD 20/30; OS 20/25
Near Stereo acuity	(+) Gross figures 250"; 100" Randot
Cover test	Dist orthophoria Near orthophoria
Pursuits	Very good
Saccades	Very good
NPC	3/6, 4/7 x2
NPC w/ Red lens (OD)	7/24 4/24 3/18 Initially had to pull target out to 24" to get fusion
Distance Retinoscopy	-0.75 over Rx OU
Near Retinoscopy:	PL over Rx
Stress Point Retinoscopy	14" w/ Rx; 7" w/ +0.50 over Rx
Subjective	-3.00 20/20 OU
Base Out ranges (distance) (prism bar)	x/18/12
Base In ranges (distance) (prism bar)	10/2
Base Out ranges (near) (prism bar)	x/16/7
Base In ranges (near) (prism bar)	18/20/12
6 ^Δ monoc prism OD @ dist	Alternating intermittent suppression w/ BU and BD; int. fusion w/ BI; fusion w/ BO
Amplitude of Accommodation	-4.00 over Rx
Positive Relative Accommodation	-4.00 over Rx
Negative Relative Accommodation	+3.00 over Rx
Maddox Rod (MR) (near)	5 exo
Brock String	ortho, no suppression, level strings
Direct Ophthalmoscopy and SLE	Normal

of us have been taught that acuity is necessary to get the visual process and/or vision therapy off to a good start. This may be true to some degree in some cases. However, there is another side to this issue. My experience has shown that there is significant improvement in acuity once the entire visual process is enhanced. Once we are able to make greater use of all available visual information and of all aspects of the visual process, we see better. This implies that acuity can be impacted from either end of the pathway.

The following cases should make optometrists think twice before simply compelling someone to read the bottom line on the chart. The first three are people who came in complaining of physiological symptoms. Their symptoms appeared to be contact lens-related. That is, standard medically oriented approaches to treating such symptoms and/or signs would demand some change in lens brand or material, cleaning solutions, or other wearing practices since all the chief complaints involved physical discomfort of some kind. The final case involved severe dry eye symptoms that

had already been treated with a standard medical approach, only to fall far short of even eliminating the presenting complaint. In all cases, the symptoms were eliminated quickly with a behavioral approach to prescribing lenses and/or vision therapy.

Elizabeth

Elizabeth, a 33-year-old Caucasian female, presented with complaints of long-standing intermittent difficulty wearing contact lenses. She had worn contacts on and off for many years, with periods of relative comfort alternating with periods of total inability to tolerate the same lenses. The latter periods included severe itching and burning as well as eye pain. She would then discontinue wearing contacts for some period of time, after which she would try again. When she came in, she had sworn off contact lenses for over a year. There were no other visual complaints.

Elizabeth was first seen for a routine evaluation (Table 1). She was, however, interested in making another attempt at wearing contact lenses. Her findings were relatively unremarkable except for an alternating intermittent suppression. Since my practice is referral (and mostly vision therapy) based, I don't see a lot of people who look this good on paper. If it hadn't been for reduced unaided acuity due to nearsightedness, I would have let this nice young woman escape from my office completely unscathed. I told her that she was doing quite well visually. Unable to resist temptation, however, I added that she might be able to reduce her dependence on lenses by doing vision therapy. I was encouraged that vision therapy would be fruitful after seeing her positive response to plus at near and her immediate ability to see 20/20 without any compensating cylinder. I informed her that even if her prescription did not change, she might achieve other benefits, such as increased visual comfort and stamina. She began vision therapy the following week. The first prescription she received from me was -3.50 OU contact lenses (20/20-1). Less than two months later, we tried having her wear her +0.50 in spectacle form over the contacts full time and especially for all close work. This presented no problem, so we changed her distance Rx to -2.50 OU (20/20-1). Elizabeth completed 15 therapy sessions over a span of five months, before stopping for almost six months due to time constraints, wearing -2.00 contact lenses OU (20/20-1) and continuing to use the +0.50 as recommended.

Elizabeth returned at this point complaining of a severe reaction to her contact lenses over the previous three weeks. I could see the remnants of severe redness and swelling. She told me that her eyes had practically swollen shut several days prior and several times prior to that. Each time she would stop wearing the lenses for a few days until things cleared up. She then tried to wear her contacts again, only to have the whole episode repeat several times. We tried to isolate all the possible factors that might be causing this reaction; we replaced the lenses, we changed solutions, she stopped wearing makeup,

Table 2: Examination data from Renee

Current Rx	OD -4.50-0.50x178 (20/25) OS -4.75-1.25x165 (20/50)
Current contact lens Rx	OD -4.75 OS -6.00-1.00x160 OU +1.00 NVO over CL Rx
Keratometry	OD -1.25x180 AM 42.87 OS -3.87x180 AM 43.00
All testing done with current spectacles	
Near VA	OU 20/20; OD 20/30; OS 20/25
Near Stereo acuity	(+) Gross figures 250"; 100" Randot
Cover test	Dist 5 exophoria Near 8 exophoria
Pursuits	Very good
Saccades	Very good
NPC	6/9, 2/3 x2
NPC w/ Red lens (OD)	7/24 4/24 3/18 Initially had to pull target out to 24" to get fusion
Distance Retinoscopy	OD -4.50-1.00x180 OS -6.00-1.00x180
Stress Point Retinoscopy	14" w/ Rx; 7" w/ +0.50 over Rx
Subjective	-5.00 20/20+1 O -4.50 20/50 OU
Base Out ranges (distance) (prism bar)	10/20/16
Base In ranges (distance) (prism bar)	14/12
Base Out ranges (near) (prism bar)	x/18/4
Base In ranges (near) (prism bar)	x/16/11
6 ^Δ monoc prism OD @ dist	BD large vert separation, high exo; BU little vert sep, tiny exo
Maddox Rod (MR) (near)	MR=OD: ½ L hyper; 8->13 exo. MR=OS: 1½-2 L hyper; 11-12 exo
Brock String	ortho<->exo, central alternating intermittent suppression, left string higher
Midline Test	consistent shift to left, about 1"
Direct Ophthalmoscopy and SLE	Normal

only wore the lenses at home, only wore them at work ... nothing eliminated the reaction. Each time it cleared up, she tried the lenses again, with the same result. They might be fine for a few days, but then the reaction would return. Just as I was running out of ideas, ready to refer her to a colleague with more medically oriented expertise, I decided to try one more thing. I changed her contact lens prescription from -2.00 to -1.50. After that, the only thing that returned was Elizabeth for further vision therapy. She referred her husband and several neighbors looking for something different in their eye care (what I prefer to call vision care). She returned to do some more training one year after our initial evaluation. At that time, her acuity was 20/20+3 OU with -1.50. Seven months later, trialing plano and -1.50 OU, she obtained visual acuity of 20/40 and 20/20+3, respectively. She is happy and comfortable with this as it suits the vast majority of her needs. As an aside, her husband has reduced his distance prescription

from OD -3.00-1.50x90; OS -2.75-2.00x100 to -1.50 with 20/20+ OU acuity and greatly increased comfort.

Renee

Renee, a 50-year-old Caucasian female, presented with complaints of difficulty reading signs while driving, as well as trouble reading. She was president of a consulting firm, very busy, and traveling often. Renee was especially bothered by her overall experience with monovision, which she had been prescribed two years earlier. She also reported frequent itching and burning of her eyes, eye pain, and frequent twitching in her left eye over the last two years.

More than any of her other findings, Renee's history prompted me to recommend vision therapy (Table 2). Her difficulty with convergence, vertical phorias, signs of alternating suppression, and a desire to help her recover from monovision also made me think vision therapy would be a big help. Due to her busy schedule, she didn't start until 2 1/2 months later. At her first session, Renee was prescribed -5.50 sphere (contact lenses) OU. Her initial acuity with this prescription was 20/20+2 OU. I prescribed this for two reasons: 1) As noted previously, I am usually interested in seeing how a person manages with equal lenses, even when the two eyes measure different refractive states, and 2) I am almost always interested in seeing how a person does without compensating cylinders. I always try to use and prescribe lenses in as therapeutic a context as possible. To me, this means providing lenses that allow the brain to make changes rather than using lenses that do all the work, as compensating lenses tend to do. There are often positive changes when you prescribe lenses that leave room for the system to breathe. In my experience, most compensating lenses stifle flexibility of the visual process. Obviously, Renee needed some kind of lens compensation, but I wanted her lenses to do more than just provide maximum distance acuity. I wanted her lenses to support visual comfort, optimal performance, and continued development of the visual process. She was also prescribed -1.25 sphere OU (in spectacle form for over the contacts) for night driving or other activities demanding increased distance acuity, as well as +0.50 spheres OU for near (also for over the contacts). The extra minus gave her an acuity boost that she could use as needed. In my way of thinking, it is much better to use lenses as needed rather than wearing the stronger prescription full time for no real reason other than convenience. Since most of Renee's work was either at a desk/computer or dealing with people face-to-face, I thought she would be better off spending most of her day in lenses appropriate for her typical demands; the same holds true for the plus to be used for extended time at the computer or desk (Unfortunately, she did not get either of the glasses until almost three months later). She returned in 1 week reporting significant symptomatic relief. She was able to wear her contact lenses full-time with no complaints. After her third session, she agreed to try -4.75 contact lenses for full-time use. Her acuity was measured at a fluctuating 20/20

Table 3: Examination data from Katie

Current Rx	OU -3.50 (OU, OD, OS 20/20)
All testing done with current spectacles	
Near VA	OU 20/20; OD 20/30; OS 20/25
Near Stereo acuity	(+) Gross figures 250"; 100" Randot
Cover test	Dist: orthophoria Near: 4 exophoria
Pursuits	Very good
Saccades	Very good
NPC	TN x2
NPC w/ Red lens (OD)	1/4, 2/5, 3/7
Distance Retinoscopy	OD -2.50 OS -2.00
Stress Point Retinoscopy	16"; w/ +0.50: 8"
Subjective	-2.50 20/20-2, 20/15-2 OU -2.00 20/40+2 OU
Base Out ranges (distance) (prism bar)	4/12/4
Base In ranges (distance) (prism bar)	8/5
Base Out ranges (near) (prism bar)	19/20/4
Base In ranges (near) (prism bar)	x/16/13
6 ^Δ monoc prism OD @ dist	BD: exo->ortho; BU: ortho->eso; BI and BO: fused
Maddox Rod (MR) (near)	MR=OD: 8-10 exo. MR=OS: 5-7 exo with int supp OS
Brock String	ortho, int central supp OD, right string higher
Direct Ophthalmoscopy and SLE	Normal

OU with these lenses when she returned the following week. She has been complaint-free for 2 years and has referred her daughter and two employees.

Katie

Katie, a 24-year-old Caucasian female, had worn minus lenses since the age of nine. Her job consisted of long hours in front of the computer. She presented with complaints of asthenopia (her eyes would burn) and a complete inability to wear contact lenses for several months due to discomfort.

Katie was first seen for a routine exam (Table 3). Based on her findings, my interpretation of them, and a pleasant negotiation, she was prescribed -2.00 contact lenses OU. I wanted to start with lenses that allowed more freedom of movement, visually speaking. I find it is often useful to start with 20/40 distance acuity. This leaves room for improvement and for awareness of normal fluctuations that most standard prescriptions obscure. As noted above, -2.00 OU provided 20/40+2 distance acuity. Katie returned one week later to begin vision therapy; her acuity at that time was OU 20/20+2, OD 20/30-3, OS 20/20+2 with the new lenses. She reported no burning sensation. One month and three therapy sessions later, her acuity was OU 20/20+2, OD 20/25-2, OS 20/20. She was then prescribed +0.50 spheres OU (in spectacle form over the contacts) for all near work. Actually, it was recommended that she wear the plus as much as possible for the first month or so.

Katie only completed two more sessions after that due to time constraints. She retained her distance acuity with the reduced lenses, and her symptoms never returned over several years of progress evaluations.

Sandy

We have all been confronted with patients complaining of dry eye. There are various causes and forms of treatment for dry eye. Treatments include nutritional supplements to improve tear quality, artificial tears and other eye drops/ointments, and punctal plugs to stop tears from draining away from the eyes. All of these treatments assume that there is something physically wrong – poor tear production, poor tear quality, etc.

I have treated many people with dry eyes over the years. I have not used any of the above methods (with the exception of occasional nutritional recommendations) to treat dry eye symptoms. One reason for this is that I do not delve into the medical aspects of eye care since I have experienced colleagues who help my patients for these issues. The other more important reason is that many cases of dry eye are caused by visual stress – I call this a high-risk visual environment. People who spend their workday at the computer or desk are under persistent visual stress. The human visual system was not designed for this kind of workload. Not everyone is symptomatic, but many people are unaware of the toll this kind of activity takes on their visual system. Many people do exhibit symptoms like eye fatigue, headaches, neck aches, dry eyes, etc.

Sandy, a 25-year-old African American woman, was recently out of college and working long days at a computer in a windowless room. She contacted me from out of town. She had been to numerous doctors trying to solve her visual complaints. Sandy recently began having trouble seeing in the distance and was getting frequent headaches, double vision, and eye fatigue. She was also experiencing severe dry eyes. The only doctor who had any kind of answer provided her with punctal plugs.

Sandy was extremely uncomfortable and frustrated when we first met. She still had frequent eye discomfort, headaches, and double vision, and her eyes still felt extremely dry on a consistent basis. Plus, people kept asking her why she was crying because her tears, now unable to drain properly, were constantly running down her cheeks. Sandy clearly didn't have any problem producing tears. Maybe something else was causing her dry eye sensation. And what about all her other complaints? Examination data can be found in Table 4.

It turned out that Sandy had poor saccades, convergence insufficiency, and unstable accommodation. Remember, Sandy is a college graduate and a dedicated employee. She made it to where she is by hard work and perseverance. It is very likely that her visual conditions were present well before she became symptomatic, quite likely beginning at an

Table 4: Examination data from Sandy

Current Rx	OU Plano (OU, OS 20/20; OD 20/25)
All testing done with Plano	
Near VA	OU 20/20; OD 20/30; OS 20/25
Near Stereo acuity	(+) Gross figures 250"; 100" Randot
Cover test	Dist: orthophoria Near: 4^ alternating, intermittent, exotropia
Pursuits	Very good
Saccades	Intermittent undershoots; worse in Z-axis w/ diplopia at near
NPC	TN x2
NPC w/ Red lens (OD)	1/4, 2/5, 3/7
Distance Retinoscopy	OU +1.00 unsteady
Near Retinoscopy	OU PL-0.50x180
Stress Point Retinoscopy	16"; w/ +0.50: 8"
NPC w/ +0.50	7/12 x2
Subjective	Plano OU
Base Out ranges (distance) (prism bar)	10/12/6
Base In ranges (distance) (prism bar)	8/2
Base Out ranges (near) (prism bar)	16/20/16 (looked pained at break)
Base In ranges (near) (prism bar)	x/8/2
6^ monoc prism OD @ dist	BD: ortho; BU: ortho; BI and BO: fused
Maddox Rod (MR) (near)	MR=OD: ½ L Hyper; 7-8 exo. MR=OS: ½ L Hyper; 7-8 exo
Direct Ophthalmoscopy and SLE	Normal

early age. She pushed through since nobody ever diagnosed her considerable visual issues, and she had to find a way to succeed. She needed someone to dig deeper in order to understand the causes of her complaints and symptoms and provide treatment that would properly address the issues.

In Sandy's case, all it took was the proper lenses. However, these were not the typical lenses with which most people are familiar. These lenses were not compensating lenses; I would characterize these lenses as what Robert Kraskin referred to as counter-stress lenses. I prescribed +0.50 spherical lenses in spectacle form for Sandy to use while at the computer, since all the close work she was doing was strongly implicated in her complaints. These lenses did not change how clear things looked, at least not directly. They spread the distribution of light entering the eyes and changed the way the brain and body were responding to visual demands in a way that reduced the demands and stress on her binocularity and accommodation. It is likely that Sandy's situation would have improved even more had she been able to try vision therapy, but she lived too far away, and her schedule was too busy. Thankfully, the lenses had enough of an impact to stop her headaches and double vision almost immediately. Within a short period of time, all her symptoms, including her nearsightedness and dry eyes, were gone. Lenses used in this way are intended to change the feedback to the brain in order to stimulate more

efficient use of the visual process. I describe this as using lenses to stimulate change from the inside out, rather than from the outside in. Counter-stress lenses do not do the work that the brain cannot do; they promote changes in the brain that enable it to change how it is doing things. This helps train the brain to use the eyes more efficiently.

Conclusion

All of these people had complaints about their visual comfort and function. Each of them either had, or would likely have had, their physiological complaints dismissed, overlooked, or simply treated symptomatically from a medical model. Sandy received what I consider to be a fairly aggressive response to her dry eye, punctal plugs. Most doctors would not consider the possibility of a functional basis for such common and easily treated overt symptoms. I have seen patients like this on a fairly regular basis over the years. They are adults with dry eye, blepharitis, twitching lids, eye pain, headaches, etc. Behavioral optometrists are accustomed to dealing with headaches, eye fatigue, and vague eye discomfort. I am sure that most behavioral optometrists have also had experiences similar to those described above. We can often have significant impact on symptoms like these, and so much more. People often do not realize that they can be more comfortable and more productive thanks to proper lenses and vision therapy. They are accustomed to things being the way they are and usually assume that what they are experiencing is normal, unless the severity is great enough to cause them to seek help. It doesn't help that most eye care professionals remain unaware of the connection between visual development, function, stress, and what are typically considered to be the kinds of physical pathology described here.

I think of lenses as medicine even though they are worn and not taken internally. Like many medicines, lenses can be used in more than one way. Medicine can be used to compensate for some deficiency or to stimulate some change in internal processes. The latter approach tends to promote fewer undesirable side effects. Lenses can be used as a simple crutch to compensate for a superficial problem, or as a means of stimulating internal changes that help eliminate the superficial problem (refractive issues, poor eye alignment, etc.) by dealing with the actual causes. A lens is also a tool. It is always important to have the right tools for the job. It is possible, but not advisable, to hammer a nail into the wall with a sledge hammer. This becomes even more important if you are planning to hammer many nails into the wall. Not only are you likely to miss a few times, putting large holes in the wall, but your arm will get very tired. If you persist in this long enough, you could cause long term damage to various parts of your anatomy. Using a more appropriate smaller hammer will enable you to pound away almost endlessly with less fatigue and greater accuracy. A concave lens designed for nothing more than maximum distance acuity is similar to the sledge hammer. While there is no doubt that such a lens

will enable one to see clearly in the distance, and in most cases at all distances, this in no way implies that it is the most appropriate tool for the job. What is the job? The job is to see comfortably and effectively at varying distances for varying periods of time, under varying environmental, emotional, and physiological conditions. The implementation of a more functional/behavioral approach to vision care and prescribing lenses can help any practitioner provide more comprehensive care for all types of visual complaints for people of all ages.

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