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Astigmatism…with a Twist

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"Astigmatism is very difficult to define."
A.M. Skeffington (Practical Applied Optometry)

Luckily for me, and probably for you, I will not attempt to define astigmatism. I just want to open a dialogue about it. Almost everyone has astigmatism to one degree or another. Most patients seem to know the word and relatively few seem to know what it really means. Many people believe it to be a disease of some sort and will be upset or frightened when told that they have it, much more so than being told they are nearsighted or farsighted. There are some people who seem incapable of being satisfied without a lens that addresses the bi-meridional nature of their refractive state. I believe there are many more who actually have a measurable amount of astigmatism and are oblivious to the fact because for them it presents little if any obstacle to optimal performance. There are also those who have lenses that address the issue but who do not seem to need such a lens. It is the last two groups that I find the most interesting. I think I can count on one hand the number of prescriptions from other doctors that were spheres. Also, I don't think I've ever seen an auto-refractor printout that didn't show the presence of astigmatism, although I admittedly haven't seen many such printouts of any kind.

"The specific cause of astigmatism is unknown. It can be hereditary and is usually present from birth. It can change as a child grows and may decrease or worsen over time."
according to the AOA website

We as optometrists are taught that either the cornea or the lens is other than spherical, causing one meridian to focus light differently than another. This causes certain aspects of an image to come into focus differently than others or to remain out of focus unless a lens is applied. Cylindrical lenses can be used to compensate for this refractive situation. That is to say, we can mask the symptom/and or measurement – reduced acuity and/or the mere presence of astigmatism – with a compensating lens. According to Skeffington, it was a minority of patients subsequently found to have astigmatism whose presenting complaint was reduced acuity, but rather reduced performance/comfort. I have the sense that those who did not initially complain of reduced acuity prior to wearing cylindrical lenses will often notice the decrease in acuity if the cylinder is, after being worn for some period of time, removed.

Doctor: Your eye is shaped like a football.

Patient: Where are the laces?

Each practitioner has a favorite way of describing it, mine goes something like this: some part of the optical system of the eye is shaped in such a way that when light passes through it gets twisted in a certain way. This causes light to focus in an asymmetrical way that is different than just being nearsighted or farsighted. If this description is not immediately clear, as can be the case, it at least opens the way for a dialogue that will ultimately lead to a mutually satisfactory description…usually. That being said, I prescribe lenses to compensate for astigmatism infrequently, if not rarely. I am

much more likely to reduce the amount or completely remove the cylinder from a person's prescription than I am to be the first one to prescribe it.

I would have to think long and hard to recall the last time I prescribed cylinder for someone who has never before worn it. This is admittedly a personal bias, one that I hope to communicate effectively, buy not a bias that should be difficult to adopt if I am successful in my communication. Those who are familiar with my philosophy will recall that I am fairly adamant about wanting to prescribe the least amount of lens power possible to both satisfy the patient's immediate needs and promote positive development from that point forward.

Often the patient's immediate needs tend to be perceived differently over the course of the evaluation, dialogue and negotiation that occur during the initial encounter.

Astigmatism is not the problem.
It is part of the person's attempt to solve the problem.

Not all astigmatism is the result of physical "abnormalities" in the visual apparatus. Some, if not most, results from a person's attempts to come to grips with visual demands that they are struggling with in some way. Cylindrical lenses serve merely to mask or compensate for the overt sign, symptom and/or chief complaint. As with most compensatory lens applications, we are interfering with the at least somewhat successful strategy being utilized by the individual. And there must be some advantage or it is unlikely to be attempted in the first place. One of those advantages is the ability to deal with a greater volume of space in any given moment. Another is the ability to better visually manage chronic postural warps. When we simply compensate for the outward symptom, not only are we denying them the benefits of their strategy, we are often further complicating the issue as this person must now reapply a familiar strategy, only now they must do it with the compensating lenses as part of the system.

If the embedded visual behavior is to be
superseded by improved Performance, through
the process of training, the cylinders
may well be a deterrent.
A.M. Skeffington (Practical Applied Optometry)

We typically measure astigmatism monocularly, either with the autorefractor, keratometer, retinoscope and/or the phoropter. We measure it monocularly and then we prescribe it based on further monocular investigation during the subjective. Perhaps there are those among us who go the extra step to experiment, along with the patient, and find that we can modify the prescription based on some binocular probing; I don't think that this describes a typical approach within our profession, nor even among those who practice within the behavioral/developmental model.

I've had a difficult relationship with astigmatism since at least my third year in optometry school. This should come as no surprise seeing as I was a problem student throughout my professional educational experience (actually, throughout my entire educational career, but that is not likely germane to the current discussion). Those familiar with my approach to prescribing lenses will find the following even less surprising.

I think that astigmatism is generally one of three things: 1) a normal variant that often requires no attention whatsoever, 2) a sign of visual stress that may well be amenable to therapeutic intervention

and 3) a refractive issue that requires compensation of some sort. Mostly the first, fairly often the second and infrequently the third. This of course does not preclude any and all combinations.

Minus cylinder axis 180 individual is primarily having difficulty with discriminations and interpretations. Minus cylinder axis 90 individual is primarily having difficulty with orientations. If you can get rid of or reduce minus axis 180 cylinder, you get better results in visual performance and when it comes to axis 90, you've got to be a little more cautious about how you approach it.
Gerry Getman

By the time I was in my mid-30s I was wearing -1.50 x 180ish OD and -0.75 x 145 OS cylinder (on top of my mountainous minus). I don't know when cyl was first prescribed but I started wearing minus at age 8. During phoropter lab at PCO one day, I (age 33) asked my lab partner to remove the cylinder from both eyes while I was sequestered behind the phoropter. After a few seconds I repeated my request and was told that it had already been done. This surprised me since there was absolutely no perceptible change in acuity. This caused me to update my Rx by simply removing the cylinder from both lenses in an attempt to carry out an experiment on the only subject available to me at that time.

Your glasses have astigmatism.

The first thought I had was that astigmatism is easy to measure and then prescribe as a monocular phenomenon; my sense is that there is likely a very different subjective experience with both eyes open. Over the next several years I happened to have my eyes auto-refracted several times, usually showing similar amounts of astigmatism each time...until, about six years later the auto-refractors stopped finding any astigmatism in the left eye and found very little in the right. This new refractive measurement has also been verified by several respected, skilled optometrists. I took from this that the cylinder in the glasses caused structural changes in the eyes themselves that were reversed once the offending stimulus was removed. This is part of the reason I often tell first-time patients that their glasses have astigmatism – as opposed to saying that they have astigmatism.

This may not be a double blind study but it is certainly a double very-nearsighted study with an incontrovertible n of 1. I hope this inspires more questions than it answers.

The single most effective first step in working with people may be changing their habitual Rx.

I don't claim to have a scientific explanation for how or why to reduce or remove compensatory lens power, be it sphere or cylinder. Neither do I have any simple formula. All I know is that with the hundreds of people who have joined me in this exploration of options I have had very few experiences that were not gratifying for both doctor and patient (starting with the time I played both parts). Granted, the majority of these cases included active visual training, which I believe played no small part in the ultimate outcome, or at the very least in the timeframe. Although it is not uncommon for the simple act of changing the prescription and using the new prescription for some number of days or weeks to elicit positive changes in both acuity and performance. In fact, my experience has been that the first thing to do with a new training patient is to modify any habitual Rx that has been in use prior to VT.

One thing that almost every case had in common was the inevitable, "I tried my old glasses on the other day and things were clearer, but it made my head hurt." I have come to the conclusion, after forty years as a patient and twenty as a practitioner, that often when the doctor has to say to a patient

complaining about the new Rx that they will have to get used to it, that means there is likely something about the Rx that is not beneficial for that person. I have dispensed many more therapeutic prescriptions than compensating prescriptions and I can count on both hands the number of people who complained of having trouble with their lenses.

Compensating lenses can cause more problems than they solve.

I am also convinced that there are some people who cannot achieve maximum comfort AND maximum acuity with the same Rx; I will opt for comfort over acuity every time if I have to make the choice and I counsel my patients to consider this option whenever such a situation arises.

It has been said that it is not what a lens does but what a person does with a lens. Conversely it may be useful to consider what a person does without a lens. Who knows how many people go for years without availing themselves of compensating lenses? Hopefully nobody in this room is unaware that compensating lenses are perfectly capable of provoking binocular and/or refractive trouble for the wearer they were prescribed to help.

In most cases we are attached to 20/20 acuity. If that is the only concern, it is hard to argue with the ability to improve acuity with lenses - the stronger the better up to a point. Lenses are not always the best answer to improve acuity but they are the fastest and the easiest and in comparison to surgical options, much safer. However, even lenses can have unwanted and undesirable side-affects. These affects are often subtle enough that they may remain unrecognized in perpetuity even though the changes in performance they cause are real and detrimental to optimal function and comfort.

When I give my patients the options I feel are best for them or at least available to them, I am careful to be clear that their current prescription is not wrong and that most doctors would probably concur with their current prescription while mine is the minority opinion. Also, I have come to the conclusion that there is rarely one precise prescription that is needed to the exclusion of any or all others, that is, there is likely, and preferably, a range of lenses that may provide optimal acuity. And, there are likely multiple prescriptions necessary to serve the specific, varying demands of a given individual even if s/he is pre-presbyopic.

I feel that compensating for astigmatism has a strong tendency to constrict movement and decrease a person's flexibility. This is admittedly more of a feeling than a researched conclusion. However, that feeling is based on considerable clinical evidence resulting from working with hundreds of patients. My clinical experience has shown that reducing or removing cylinder has helped open the door for positive development of the visual process.

I have a referral only practice, which may be why I am rarely focused on monocular acuity as a major issue. I am usually working with people who are looking for an approach other than that which they have already experienced - the refraction/compensation-only model. My assumption going in is that cylinder is at least in part problematic if the sole purpose of the cylinder is to improve monocular distance acuity (as I believe it almost always is). Don't forget, you can always replace the cylinder if you and/or the patient are not happy with the changes that are taking place after the Rx is modified. It's exciting to see what can happen when you venture outside the box.

I infrequently scope anyone without seeing at least some cylinder at one distance or another. Perhaps some of that is mine, I'm not certain. Merely scoping it rarely inspires me to prescribe it. I will prescribe it when the negotiation between the patient and me dictates that it will be valuable, especially if it is someone who has worn cylinder for some number of years - then my intent is to see how little we can get away with.

One of the first instances of removing cylinder was with a woman in her early 50s. I showed her a pair of lenses without her habitual cylinder. Her immediate, unprompted response was, "It's not as clear but it's more comfortable." I will opt for comfort over acuity any day. And so it seems will most of my patients. I have many stories like this. Instead of telling more of them I encourage you to go out and help create some of your own.

There's no question that reducing an Rx isn't for everyone and without proper information could easily backfire. If the patient has no interest in pursuing a path other than that which got him into his current Rx there's not much hope. If he's looking for a different approach, my opinion is - it's always worth a try. I feel that one of the most important things I can offer is OPTIONS.

I know there has been a lot of attention paid to acuity in the above since this seems to be a major stumbling block in this thread. But make no mistake, this is nowhere near the top of my list of issues in working with reduced prescriptions - sphere or cylinder. I am looking for overall improvement in comfort and performance and positive future development of the visual process. As I said, usually there will be improved acuity - most likely with weaker lenses and I have increased the Rx in the end for a few people to give them the acuity they want - knowing that the Rx will not affect them the way it did in the past. More often, people get a 20/20 Rx for specific situations and use it sparingly, and more importantly, appropriately.

Hopefully, the next time you are confronted with the issue of prescribing cylinder instead of asking yourself, “How much?” you’ll ask, “How come?”