



National Academy of Opticianry

Aniseikonia: What It's All About
(Approved by the ABO and NCLE)

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Among eye care professionals, there exists an innate desire to improve the quality of their patients' lives by prescribing and recommending eyewear solutions that provide the best visual experience. Generally, the patient's visual needs and day-to-day visual demands dictate the most appropriate corrective device. However, in addition to a patient's practical needs, certain refractive conditions may also require careful management, to at least minimize, if not prevent, complications arising from the corrective lenses, themselves.

Both ophthalmic and contact lenses influence image size; although, contact lenses do so to a significantly lesser degree. By nature of their design, "plus" powered lenses produce *positive* magnification, and "minus" powered lenses, *negative* magnification. The degree of influence lenses have on magnification is dependent on five factors:

- Lens center thickness
- Lens material (refractive index)
- Base curve
- Back vertex lens power (prescribed Rx)
- Vertex distance

For most patients, differences in refractive errors between each eye are relatively minor. Accordingly, although corrective lenses will result in some degree of magnification, it should, at least, be relatively similar for both eyes. On the other hand, patients with significantly different refractive errors between each eye can experience large disparities in the image size and/or shape received by both eyes; a condition known as Aniseikonia.

ANISEIKONIA

Derived from the Greek, meaning, "without/not equal images",¹ aniseikonia is defined as, "A relative difference in size and/or shape of the ocular images formed by the two eyes."^{2, 3}

When aniseikonia results from anatomic conditions, such as an unequal distribution of rods and cones between both eyes, or differences in cortical image size, it is referred to as *anatomic aniseikonia*. However, it can also be related to either the optics of the eye (*inherent optical aniseikonia*), or the optics of a

¹ Lancaster, W. "Aniseikonia."

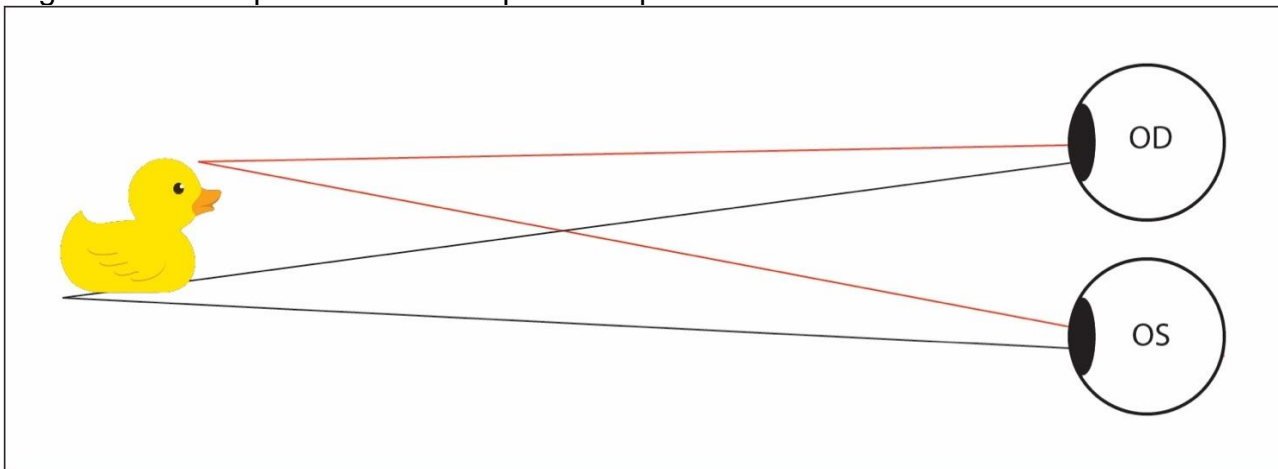
² Hofstetter, Henry W., et al. *The Dictionary of Visual Science, 5th Ed.*

³ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.

corrective lens (*induced optical aniseikonia*). Regardless of cause, aniseikonia can greatly compromise stereoscopic vision.

As illustrated in figure 1, stereoscopic vision provides a realistic impression of our environment (depth perception), when a certain degree of equality exists between the retinal images of both eyes. Actually, stereoscopic vision exists and can manifest spatial distortion when the images differ inordinately in size or shape. To produce a single mental percept from an object of regard, the images formed by the retinas of both eyes must undergo the process of sensory fusion.³ The greater the similarity, the easier it is for this fusion to take place. In all reality, most patients likely experience a small amount of aniseikonia (less than 1%), either between the two retinas, or in the visual cortex. However, such subclinical amounts often simply present in the form of sensory eye dominance, resulting from the monocular cortical cells wired to the dominant eye slightly outnumbering those wired to the non-dominant eye.⁴

Fig. 1: Stereoscopic Vision and Depth Perception



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However, when significant disparity exists, it interferes with the process of sensory fusion, resulting in *anomalous* spatial perception with apparent changes in one's environment.³ In terms of the significance of its effect, "Aniseikonia of 2% or more is considered clinically significant, and 3-5%, highly symptomatic."⁵ Interestingly, patients presenting with more than 10% aniseikonia are generally less symptomatic than those with smaller amounts; presumably, this is because there is no attempted fusion of images with such disparity. It is assumed, in such

⁴ Kundart, James OD. "Diagnosis and Treatment of Aniseikonia: A Case Report and Review."

⁵ Bannon, RE, Triller, W. "Aniseikonia – A clinical report covering a ten-year period."

extreme situations, that suppression provides relief, and the brain will often ignore the smaller of the two images.⁴

MEASUREMENT OF ANISEIKONIA

While it has long been out of production, the gold standard for measuring aniseikonia is the Space Eikonometer.

Alternative methods include:

- The Awaya Aniseikonia Test, which consists of a simple book test, along the lines of the pseudoisochromatic plate tests used for color blindness⁶
- The Aniseikonia Inspector (AI) software, available from Optical Diagnostics⁶
- An iPad system developed by Sasaki⁶
- 3D video displays that utilize circular polarizing filters⁶

However, it has been reported that most image size differences that present in clinical cases are between 1.0 and 2.0%, and therefore, are too small to be detected with most screening instruments, due to their limited range in sensitivities.⁷

As is the case with measuring axial length, most practitioners do not have easy access to such tools or programs, so being able to make estimations based on available data can be extremely helpful to the provider.

ESTIMATING ANISEIKONIA

By knowing the refractive error, it is possible to estimate the percent differences in magnification, and determine whether or not any aniseikonia present will likely result in complications for the patient. Again, findings indicate that patients experiencing magnification differences of 1-2% between each eye, may be symptomatic.⁸

For estimation purposes, the industry-accepted rule of thumb is:

- 1D anisometropia = 1% of aniseikonia⁹

⁶ Kundart, James OD, MEd. "Diagnosis and Treatment of Aniseikonia: A Case Report and Review."

⁷ Bannon, R.E. "Aniseikonia and Binocular Vision."

⁸ Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.:* "Anisometropia", 491-498.

⁹ Habdan, N. "Treating aniseikonia with stock base curve manipulation in asymptomatic adults."

SYMPTOMS OF ANISEIKONIA

Patients are not always able to articulate the problems they may be experiencing, unless it's something simple like, "I can no longer read the captions on my tv." In such cases, it's often necessary to read between the lines of what they're sharing to effectively determine the root cause(s) of their problems/concerns. Especially since patients experiencing symptoms of aniseikonia might describe how their eyes "feel", rather than a vision complaint.¹⁰

For example, they may report:

- Asthenopia, giddiness, and nervousness¹¹
- Compromised depth perception and eye-hand coordination¹¹
- Horizontal prismatic effects¹¹
- Differential vertical prismatic effects at the reading and distance level¹¹ *
- Headaches, diplopia, disorientation or dizziness, tearing, eye pain or fatigue, sensitivity to light, visual acuity issues and trouble reading, as well as nausea¹¹

** Patients dealing with refractive anisometropia can experience significant vertical prismatic effects when viewing through a point in an ophthalmic lens other than its optical center. This is especially problematic for presbyopes wearing multifocal ophthalmic lenses, with which they are forced to look significantly down and away from the optical center, to use the near reading area. With progressive addition lenses, vertical prismatic effects can also be experienced through the distance reference point.*



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¹⁰ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325..

¹¹ Columbia University Department of Ophthalmology. *Glossary: Aniseikonia through Aphakia*.

DETERMINING CLINICAL SIGNIFICANCE

Symptoms related to aniseikonia can often mimic those of uncorrected refractive errors or oculomotor imbalances. But, in those cases, symptoms are either not helped by the correction, or they appear as a result of correction.¹²

However, as previously indicated, many individuals go about their daily lives unencumbered by minor, subclinical levels of both physiologic and anomalous aniseikonia. So, it's helpful to highlight certain "red flags" that can help indicate a patient's symptoms are clinically significant.

INDICATORS FOR CLINICAL SIGNIFICANCE

- Symptoms not helped by the corrective lenses¹³
- Symptoms present after implementation of the corrective lenses¹³
- High anisometropia or high astigmatism¹³
- Presence of physically altering factors, such as pseudophakia, monocular aphakia, scleral buckling, corneal transplant, refractive surgery, and optic atrophy¹³
- Complaints of distortion – slanting floors, walls, or the ground feeling to close or too far away¹³
- Improved visual comfort when one eye is occluded¹³

While there are a variety of different types of aniseikonia that fall under the general heading, this course will limit its discussion to the two primary forms: *physiologic/non-symptomatic* and *anomalous*.

TYPES OF ANISEIKONIA

Physiologic/Non-symptomatic: occurs in individuals whose eyes are identical, in both axial length and refractive properties, and results from a lateral change in direction of gaze.

For example: consider someone turning their eyes to the right to look at an object that's off to their right side. Their left eye will be *slightly* further away from the object than their right eye, so the image seen by their left eye will be *slightly* smaller than that seen by their right. Such small disparities are, of course, expected and normal; hence the label physiologic, non-symptomatic aniseikonia. The presence of this type of aniseikonia simply serves to provide visual clues that enhance spatial awareness and eye-hand coordination.

¹² Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.*: "Anisometropia", 491-498.

¹³ Winn, et al. "The superiority of contact lenses in the correction of all anisometropia."

Anomalous Aniseikonia: refers to the presence of any other aniseikonia and indicates an *anomaly* or abnormality in either the anatomic structure of the eye, or it is caused by the optics of the eye and/or the corrective lens.¹⁴

As previously indicated, it can also be the result of modification of the retinal image due to an unequal distribution of the nerve endings (rods and cones) in the retina of one eye, compared to the other, and their representation in the visual cortex.¹⁵ Often, anomalous aniseikonia is simply referred to as *aniseikonia*.

The etiology of *aniseikonia* can be traced to either *anatomical* or *optical* anomalies; both will be discussed shortly. First, however, let's touch on how aniseikonia can affect your pediatric patients.

Pediatric Aniseikonia: Like adults, when children experience the effects of aniseikonia, the unequal focus results in persistent blur on one retina. And, as discussed earlier, when extreme aniseikonia exists sensory binocular fusion can be compromised. Unlike adults, however, in pediatric patients this can often lead to suppression of the eye receiving the smaller image, increasing the risk of amblyopia, and interfering with stereopsis.

This is yet another reason to increase societal awareness of the importance of regular eye examinations during the early years of child development.

ETIOLOGY OF ANISEIKONIA

Aniseikonia can either occur naturally, or as an unintended consequence of ocular surgery. Research indicates that cataract surgery remains the most common cause of acute aniseikonia. "When a patient with significant ametropia presents with very asymmetric cataracts, there is a danger of cataract extraction creating significant anisometropia and aniseikonia."¹⁶

It can also be of sudden onset, as a result of unilateral aphakia or pseudophakia; for example, following extraction of a traumatic cataract.¹⁷ In addition, aniseikonia can simply be related to longstanding differences in ametropia that exist between each eye.

¹⁴ Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.:* "Anisometropia", 491-498.

¹⁵ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics:* "Aniseikonia", 300-325.

¹⁶ Kundart, James OD, MEd. "Diagnosis and Treatment of Aniseikonia: A Case Report and Review."

¹⁷ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics:* "Aniseikonia", 300-325.

Regardless of its etiology, managing the condition by using the most effective approach, is our responsibility. Accordingly, it's imperative that we understand exactly what we're working with.

ANATOMICAL ANISEIKONIA

As indicated earlier, anatomical aniseikonia is related to the degree of separation of the retinal receptors and the functional organization of the terminal neural visual pathways in the visual cortex.¹⁸

Research indicates, in about 1/3 of the cases of aniseikonia, the measured image differences were seemingly unrelated to the dioptric characteristics of the anisometropia present, indicating the aniseikonia's origin to be anatomical.¹⁹

OPTICAL ANISEIKONIA

Optical aniseikonia can be further broken down into two sub-categories: *inherent* or *induced*.

Inherent Optical Aniseikonia

By definition, *inherent* implies "no outside influence". Accordingly, *inherent aniseikonia* does, in fact, include anatomical causes like those previously discussed. However, *inherent optical aniseikonia* depends solely on the dioptric system of the eye.^{18,20}

Induced Optical Aniseikonia is caused by the magnification properties of corrective lenses. It results when ophthalmic lenses are used to correct disparities in refractive errors between both eyes; primarily, in cases of *anisometropia* or *antimetropia*. This can be an overall aniseikonia (equal in all meridians), or meridional, which varies along the meridians, and is often associated with an astigmatic refractive error.

- Anisometropia is defined as, "A condition of unequal refractive state for the two eyes."²⁰ For example: OD: +4.00 DS OS: +1.00 DS
- Antimetropia is defined as, "Mixed anisometropia."²¹ For example: OD: +2.00 DS OS: -2.00 DS

¹⁸ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.

¹⁹ Ogle, K.N. "Some Aspects of the Eye as an Imaging Forming Mechanism."

²⁰ Hofstetter, Henry W., et al. *The Dictionary of Visual Science, 5th Ed.*

While the above definitions are clear, both anisometropia and antimetropia are generally considered to be clinically significant when a spherical equivalent power difference of 1D or more exists between each eye.

NOTE: Since antimetropia is defined by The Dictionary of Visual Science and Related Clinical Terms as “mixed anisometropia”, any future reference to anisometropia in this article can be assumed to apply equally to both anisometropia and antimetropia, unless stated otherwise.

AXIAL OR REFRACTIVE ANISOMETROPIA

Of course, the two primary methods to correct refractive errors involve either glasses or contact lenses. However, to determine the most effective method, when ametropias result in anisometropia, optical theory and Knapp’s law recommends first determining the source of the ametropia – axial or refractive.

Knapp’s law: “When a correcting lens is so placed before the eye that its second principal plane coincides with the anterior focal point of an axially ametropic eye, the size of the retinal image will be the same as though the eye were emmetropic.”²¹

To simplify, Knapp’s law asserts that contact lenses are ideal for correcting *refractive* aniseikonia, whereas ophthalmic lenses are better suited for correcting *axial* aniseikonia.²²

Let’s examine this assertion in greater detail.

AXIAL VS. REFRACTIVE AMETROPIA AND ANISOMETROPIA

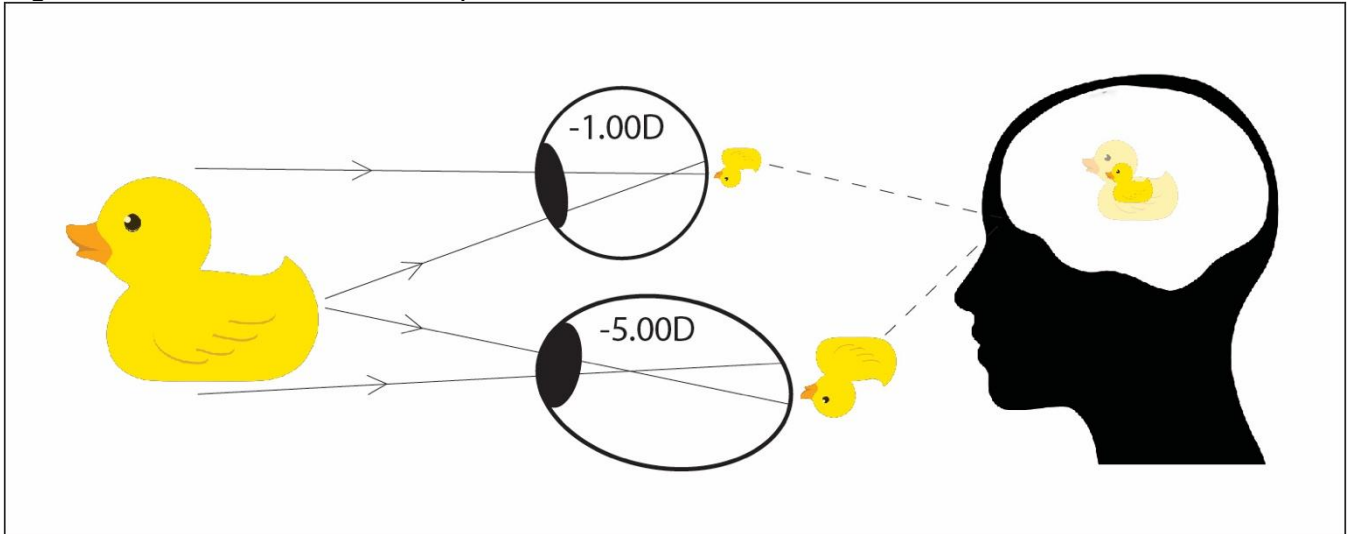
As is the case for ametropia (a monocular phenomenon), anisometropia (a binocular phenomenon), can have either an axial or refractive origin, and its source can greatly influence the theoretical sizes of retinal images, resulting in perceived aniseikonia; potentially hindering binocular perception.

In uncorrected *axial anisometropia*, the refractive properties provided by the cornea and crystalline lens are considered to be the same for both eyes, but optical theory states that the image size will be different from that of the normal eye because the axial length of the eyeball is different. Aniseikonia will exist if either eye is ametropic by differing degrees to its fellow eye (Table 1).

²¹ Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.:* “Anisometropia”, 491-498.

In other words, if a person's eye is too long or too short, the image size will be larger, or smaller, than it would be normally (figure 2).

Fig. 2: Axial Related Anisometropia and Aniseikonia



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In uncorrected *refractive anisometropia*, the axial lengths of each eye are considered equal, so the resulting retinal image size for each eye will also be essentially *equal* to that of an emmetropic eye.²² Subsequently, under such conditions, aniseikonia will not exist, when *uncorrected*.

Interestingly, history reports that Donders was one of the early writers aware of the dimensional changes in the retinal images induced by the correction of anisometropia.²³

As discussed earlier, when ametropias result in anisometropia, Knapp's law can be utilized to mathematically predict the most effective optical corrective device, based on the source of the patient's ametropia.

²² Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.

²³ Sorby, A et al. "Emmetropia and Its Aberrations."

Table 1: Nature of Anisometropia and Related Presence of Aniseikonia

- **Axial Anisometropia:** The image size for an uncorrected myope will be larger than for an emmetrope. Image size for an uncorrected hyperope will be smaller than for an emmetrope. In both cases, aniseikonia will be present.²³
- **Refractive Anisometropia:** The uncorrected image size for both myopes and hyperopes will be the same size as the image for an emmetrope. Hence, aniseikonia will be absent.²³

CORRECTING AXIAL ANISOMETROPIA

According to Knapp's law, in cases involving *axial* anisometropia, the magnification effects provided by ophthalmic lenses will, effectively, offset those induced by *axial* ametropias, returning the image sizes to normal (Table 2). So, as per Knapp's law, an ophthalmic lens approach is recommended for correcting axial anisometropia.

However, contrary to the theories put forward by Knapp's law, clinical practice has demonstrated that aniseikonia is still found to be present when *axial* anisometropia is corrected with ophthalmic lenses that are placed at the theoretically correct position. The cause of this prevailing aniseikonia is believed to be differential growth or stretching of the retina.²⁴

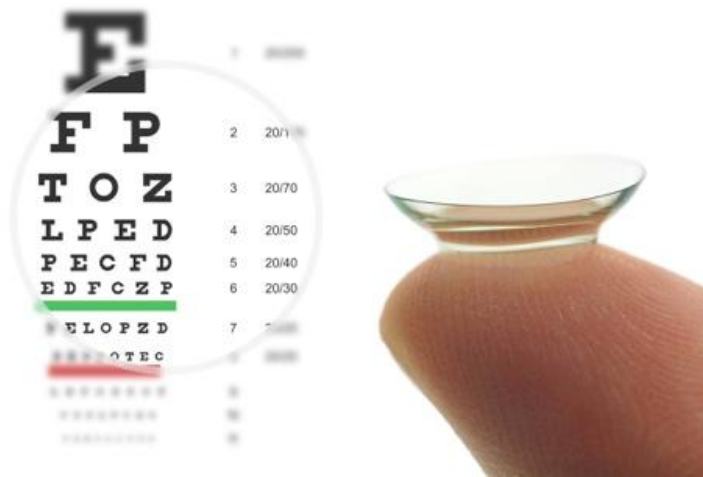
In fact, Knapp's law has long been the subject of much debate, because for it to apply, certain conditions must be met, including:

- The ametropia must be strictly axial-related (no anatomic),²⁵ data that's difficult for most practitioners to measure, in office.
- The refracting power of the eye is restricted to that of the standard emmetropic eye (58.50D)²⁸
- The shape factor of the correcting lens must be unity. (In reality, the shape factor will be a value other than unity for both "plus" and "minus" lenses, if the front surface is convex in design)²⁸

²⁴ Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.:* "Anisometropia", 491-498.

²⁵ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics:* "Aniseiknoia", 300-325.

In addition, Knapp's law also overlooks the effects of any potential retina and cortex-induced aniseikonia.²⁶ Consequently, clinical practice has demonstrated contact lenses to be "superior in the correction of *axial* anisometropia"^{27, 28} and ophthalmic lenses to result in "significantly greater degrees of aniseikonia than contact lenses."^{26, 27}



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CORRECTING REFRACTIVE ANISOMETROPIA

When ophthalmic lenses are used to correct *refractive* anisometropia, their magnification effects will result in the retinal images, for both eyes, now being *unequal*, due to the resulting Spectacle Magnification (SM) for each eye being different from unity; accordingly, aniseikonia will result (Table 2). In cases involving *refractive* ametropia, Retinal Spectacle Magnification (RSM) increases with increasing vertex distance, and is a minimum when vertex distance is also at a minimum.

Both Spectacle Magnification and Relative Spectacle Magnification will be discussed in greater detail, shortly, but for purposes of introduction:

$$SM = \frac{\text{Retinal image size in corrected}}{\text{Retinal image in same uncorrected eye}}$$

$$RSM = \frac{\text{Image size for a corrected ametropic eye}}{\text{Image size for a standard emmetropic eye}}$$

²⁶ Kundart, James OD, MEd. "Diagnosis and Treatment of Aniseikonia: A Case Report and Review."

²⁷ Winn, et al. "Reduced aniseikonia in axial anisometropia with contact lens correction."

²⁸ Winn, et al. "The superiority of contact lenses in the correction of all anisometropia."

If contact lenses are used, the vertex distance can be considered, zero (providing the cornea to entrance pupil distance is considered negligible), and the RSM will approach unity. Since contact lenses produce very little magnification, they result in the RSM differing very little from unity, minimizing the amount of aniseikonia experienced by the patient.²⁹ Accordingly, as with *axial* anisometropia, contact lenses should, again, be the recommended corrective device for *refractive* anisometropia. Of course, anisometropia can exist due to a combination of both axial length and refractive properties. The two are not always mutually exclusive.

Table 2: Presence or Absence of Aniseikonia in Uncorrected and Corrected Anisometropia

Presence or Absence of Aniseikonia in Uncorrected and Corrected Anisometropia			
<i>Ametropia</i>	<i>Uncorrected</i>	<i>Spectacle Correction</i>	<i>Contact Lens Correction</i>
Axial Anisometropia	Present	Absent	Present
Refractive Anisometropia	Absent	Present	Absent

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Let's explore *Spectacle Magnification (SM)* and *Relative Spectacle Magnification (RSM)* in greater detail, to help differentiate between the two phenomena.

SPECTACLE MAGNIFICATION (SM)

Spectacle Magnification compares the image size formed by a single eye wearing a corrective lens to the image size in the same uncorrected eye. It is defined as a type of angular magnification brought about by a single spectacle lens.³⁰

Presented in equation form:

$$SM = \frac{\text{Retinal image size in corrected eye}}{\text{Retinal image in same uncorrected eye}}$$

SM is expressed as a ratio, such as 1.10 or 0.92.

- An SM > 1.0 indicates positive magnification
- An SM < 1.0 indicates negative magnification

²⁹ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.

³⁰ Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.: "Anisometropia"*, 491-498.

Accordingly, translating the above ratios to percentages, 1.10 indicates a 10% magnification and 0.92 indicates an 8% minification.

RELATIVE SPECTACLE MAGNIFICATION (RSM)

If an ametropic eye that is corrected by an ophthalmic lens, produces an image that is smaller than the *normal* image size for a standard emmetropic eye with a +58.50D refractive power, the *negative* magnification produced by this ametropic eye, relative to the standard, is called the Relative Spectacle Magnification.³¹

If we express this relationship in the form of an equation:

$$\text{RSM} = \frac{\text{Image size for a corrected ametropic eye}}{\text{Image size for a standard emmetropic eye}}$$

How is Spectacle Magnification (SM) distinguished from Relative Spectacle Magnification (RSM)?

- SM compares the image size of one eye only, in both uncorrected and corrected states;³²
- RSM compares an ametropic, but corrected eye with a standard emmetropic eye.³⁷

The goal, then, in a perfect world, should be to utilize the most appropriate corrective device for all forms of ametropia that produces a normal image size and provides every patient with the best visual experience.

WHERE DOES ASTIGMATISM FIT INTO THE EQUATION?

By design, astigmatism is a form of refractive ametropia; so, once again, both theory and practice indicate contact lenses are the best recommendation to prevent, or at least minimize, aniseikonia. The benefits of contact lenses have even been demonstrated to reduce meridional magnification differences in isometric patients.³³

³¹ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.

³² Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.: "Anisometropia"*, 491-498.

³³ Brooks, Clifford W. and Irvin M. Borish. *System for Ophthalmic Dispensing, 3rd Ed.: "Anisometropia"*, 491-498.

DETERMINING SOURCE OF AMETROPIA/ANISOMETROPIA

Although clinical practice reveals that, regardless of the source of a patient's ametropia/anisometropia, contact lenses are always the best way to minimize aniseikonia, there may be occasions when identifying its source may be beneficial. And while an optical biometer allows for accurate axial length assessment, most offices don't have such devices at their fingertips. Thankfully, there are alternative ways to evaluate the source of a patient's ametropia, and accordingly, any presenting anisometropia:

- Keratometer readings (K's):
 - Significantly different K's, between each eye, are good indicators for refractive ametropias³¹
 - Similar K's between each eye would indicate axial ametropias³¹
- Anisometropia due to development of a monocular cataract would indicate a refractive origin³¹
- Although spherical anisometropia may be refractive, axial, or both, clinically significant levels above 2D are typically axial in nature³⁴
- Routine refractive changes in adults are usually refractive in origin³³
- Ametropia in excess of +/-4D is usually the result of abnormally long or short axial lengths³⁵

In addition, as far as the influence axial length has on ametropia, Assuming the central corneal power is the same for each eye at normal axial lengths, for every 1mm of axial length difference, you can anticipate a 3D difference in refractive error³⁵

COMBINATION OF CONTACTS AND OPHTHALMIC LENSES

Clearly, despite optical theory and Knapp's law, clinical practice indicates that contact lenses should be the primary treatment option for the management of aniseikonia. However, for your presbyopic patient experiencing aniseikonia, if a multi-focal contact lens proves unsuccessful, don't overlook the benefits of combining both single vision contacts with an ophthalmic progressive addition lens.

The contacts will balance out their distance refractive errors and also eliminate the potential vertical imbalance at distance and near they might ordinarily experience with ophthalmic lenses made to provide their total corrective needs.

³⁴ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.

³⁵ Sorby, A et al. "Emmetropia and Its Aberrations."

In such a scenario, the ophthalmic progressive lens would mostly provide their near add, together with any residual cylinder.

CONCLUSIONS

Symptomatic aniseikonia, when left unmanaged, can result in a myriad of complications, and it's our responsibility to provide patients with the best eyewear solutions. When a patient presents with concerns and visual complaints, understandably, our first instinct is often to search back through our mental archives to ascertain the best treatment option. However, as presented here, the results of clinical practice don't always agree with theories, so it's vital to always keep an open mind.

While Knapp's law implies that the best corrective device for the management of aniseikonia should be determined its origin, clinical practice continues to support contact lenses as the most effective, regardless of the source. Clearly, for Knapp's law to apply, relatively unrealistic conditions must be met. In clinical practice, some discrepancies between theory and real-life experiences exist that are similar for both myopic and hyperopic, axial-related, anisometropia.

So, why are contact lenses the best solution for aniseikonia? Well, if you were to imagine an infinitely thin lens, placed at the entrance of the pupil, both factors that are used to calculate lens magnification (shape and power), would be "1x", resulting in a spectacle magnification of "1x"; also referred to as *unity*. And, this would be independent of the patient's refractive error. And the closest we can get to this ideal, is by using either a contact lens or intraocular lens.³⁶

³⁶ Fannin, Troy E. and Theodore Grosvenor. *Clinical Optics: "Aniseiknoia"*, 300-325.