



THE IMPORTANCE OF MANAGING ASTIGMATISM IN CONTACT LENS WEARERS



Put in the work upfront to see meaningful results pay off later.

BY JASON E. COMPTON, OD, FAAO

Astigmatism is more than just a common refractive error; it's a complex visual challenge that can significantly affect our patients' quality of life. Astigmatism can lead to substantial reductions in visual performance, affecting both clinical visual measures and functional visual tasks.¹ It can result in blurred or distorted vision, eye strain, and headache. Moreover, uncorrected astigmatism in childhood can significantly influence visual

development, leading to amblyopia.² Understanding the profound effects of astigmatism sets the stage for appreciating the advancements in its correction.

Although the condition itself is not new, the methods and technologies used to manage astigmatism are continually evolving. From understanding the historic advancements in lens types to exploring the cutting-edge technologies shaping the future, this

article serves as a guide for eye care professionals committed to offering the highest standard of care.

CORRECTING ASTIGMATISM WITH CONTACT LENSES

Astigmatism correction using contact lenses has been an evolutionary journey. In the early days, rigid lenses were the primary option. These lenses were effective, but often uncomfortable, resulting in low patient compliance.³ The introduction of soft toric lenses in the late 20th century marked a significant advancement. This modality offered a more comfortable fit while effectively correcting astigmatism, making it an instant hit among patients and practitioners alike. Today, a variety of lenses are available for astigmatism correction, each with its own unique set of advantages and limitations.

Soft Toric Lenses

One of the most common soft toric designs, *prism ballast lenses*, has a thicker area at the base, which helps keep the lens oriented correctly, preventing rotation and ensuring consistent vision.

Some toric lenses are *truncated*, meaning a small portion of the bottom edge is cut off, creating a flat area that rests on the lower eyelid, helping to stabilize the lens.



Lenses with *dynamic stabilization* use the natural blink mechanism for repositioning. They have a thin profile and rely on interaction with the eyelid to maintain their orientation.

The *dual thin zone design* features two thin zones on either side of the lens, allowing better movement and alignment with the eye's natural shape.

Some toric lenses come with an *aspheric back surface* to better conform to the natural shape of the cornea, improving stability and comfort.

Gas Permeable Lenses

Front toric gas permeable lenses have a toric front surface to correct residual refractive astigmatism. They are particularly useful when the cornea is relatively spherical, but there is still astigmatism due to the lens or other internal optics of the eye.

The *back toric design* has a toric back surface that aligns closely with the shape of the cornea. This design is effective for correcting corneal astigmatism and offers a more customized fit.

The *bitoric option* has both front and back toric surfaces, allowing a highly customized fit and correction for both corneal and refractive astigmatism.

LEAVING ASTIGMATISM UNCORRECTED

Some practitioners avoid correcting astigmatism, especially at lower levels, under the belief that the visual effect is minimal and doesn't warrant the complexity and cost of specialized lenses. Although this concern is understandable, it overlooks the fact that even low-level astigmatism can compromise visual acuity and comfort, leading to patient dissatisfaction and noncompliance.

One way to overcome this concern is through comprehensive education. By understanding the long-term benefits of astigmatism correction, such as improved visual acuity and

reduced eye strain, practitioners and patients alike can better appreciate the value of management with specialized lenses.

Aside from costs and complexities, the reluctance to correct astigmatism often stems from the overall challenges involved in its management. Fitting toric lenses, for example, requires expertise in lens orientation and stabilization. Improper fitting can result in lens rotation and visual inconsistencies. Similarly, gas permeable lenses offer excellent clarity, but may be less comfortable for patients initially, requiring a longer adaptation period.

These challenges can be mitigated through specialized training in lens fitting and staying up to date on advances in lens technologies. Modern toric lenses come with stabilization designs that minimize rotation, and new materials are making gas permeable lenses more comfortable than ever. Using advanced diagnostic tools can also aid in a more accurate fitting, reducing the likelihood of errors and improving overall compliance.

THE FUTURE OF ASTIGMATISM CORRECTION

The evolution of astigmatism correction is promising, thanks to rapid advancements in two key areas: contact lens manufacturing and astigmatism diagnosis.

Advances in Contact Lens Manufacturing

Originally developed for use in high-powered telescopes to correct for atmospheric distortions, wavefront technology has found its way to eye care, where it is used to measure and correct optical aberrations of the eye, including higher-order aberrations that traditional contact lenses can't correct. Manufacturers are now incorporating wavefront-guided designs into contact lenses, offering unprecedented levels of visual clarity.

The advent of 3D printing technology has also opened up new avenues for contact lens customization, allowing the creation of lenses that are tailored to an individual's unique eye shape and refractive errors to provide a more precise fit and better vision correction.

Advances in Astigmatism Diagnosis

Corneal topography has evolved significantly over the years, and modern devices can now map the cornea with incredible precision. This allows a more accurate diagnosis of different astigmatism types and degrees, which in turn enables the creation of more effective and comfortable lenses for our patients.

Additionally, wavefront sensing is

AT A GLANCE

- ▶ **Uncorrected astigmatism in childhood can significantly influence visual development and lead to amblyopia.**
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TODAY, A VARIETY OF LENSES ARE AVAILABLE FOR ASTIGMATISM CORRECTION, EACH WITH ITS OWN UNIQUE SET OF ADVANTAGES AND LIMITATIONS.

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revolutionizing the way astigmatism is detected. This technique is not just for manufacturing.

By measuring how light waves are distorted as they pass through the eye, wavefront sensors can provide a more comprehensive view of the eye's optical system. This allows the diagnosis of not only

astigmatism, but also other higher-order aberrations that may affect a patient's vision.

THE PATH FORWARD: EMBRACING INNOVATION

As eye care professionals, our role extends beyond just correcting vision to include enhancing the

overall quality of life of our patients. With technology rapidly changing and advancing, it's vital to not only use current astigmatism corrective options, but also to stay updated on emerging innovations and those in the pipeline. By embracing these advances, we can redefine effective astigmatism care, providing treatments that are as corrective as they are transformative for our patients. ■

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