New Technology for

Scleral Lenses

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Specialty Contact Lens & Vision SOLUTIONS

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Disclosures

Bausch & Lomb Specialty Vision Products – Speaker & Consultant



Importance of New Technology

Improve the precision and accuracy of vision correction
 Improve the fit and comfort of the lens
 Promote better eye health by addressing issues such as oxygen transmission and moisture retention
 Fix longtime problems for patients





Scleral Lens Design Technology



Toric or Quadrant-Specific Limbal Clearances

Essential Elements

- Different curves at the limbal zone are used to create one steeper and one flatter meridian (or quadrant specific depending on the lens manufacturer used)
- Allows for better alignment with the cornea
- Scleral alignment with spherical or toric peripheral curves are still used to align the lens with the sclera
 - However, you may be able to be less "severe" with your design because bi-elevation helps with this

TERMINOLOGY AND LENS DESIGN

APS: Advanced Peripheral System refers to the generous Zenlens[®] landing zone.

SAG: Sagittal height includes a deep and a shallow meridian.

Bi-Elevation™

Lenses with Bi-Elevation™ have two SAG values to better align the lens with varying elevation of the limbus.

- Sagging lens
- Fogging
- Back of scleral lens is touching the limbus at one place but not another
- Lens decentering







Sagging / decentering lens

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more clearance





Back of scleral lens is touching the limbus at one place but not another

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more clearance?

How Is This Designed?

Lower clearance (steeper sagittal depth)

close/touching?

higher clearance (flatter sagittal depth) close/touching? higher clearance (flatter sagittal depth)

close/touching?

higher clearance (flatter sagittal depth)

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Scleral Profilometry



WHAT ARE SCAN-DESIGNED SCLERAL LENSES ?

Scan-designed scleral lenses are custom-made based on unique scans of the cornea and sclera. Unlike conventional lenses, they account for individual eye irregularities, providing a better and faster fit, leading to improved vision.

Essential Elements

- Measurement: Scleral topography involves measuring and mapping the shape and curvature of the sclera.
- Customization: The measurements obtained are used to create customized contact lenses that fit the individual's unique scleral shape.
- Vision Correction: Scleral topography helps in achieving aligned optics, perhaps aiding in sharper vision

This is a cornea-scleral scan (using our Pentacam CSP software) of a patient of ours who had a very irregular sclera, as well as a cornea with radial keratotomy scars.

The colors on this map show the differences in elevation on their eye. This patient

was fit with a scleral lens and achieved 20/20 vision.









Better Vision?



EyePrintProsthetic



Essential Elements

- Measurement: Using a molding material, an impression is created of the ocular surface
- Customization: The measurements obtained are used to create customized contact lenses that fit the individual's unique shape
- Vision Correction: Aligned optics aide in sharper vision.
 Prism and HOA correction able to be incorporated.











This patient's impression will be made into a scleral lens. This is the most advanced scleral lens design in the world. She requires higher customization because the lens is going to incorporate prism (to fix double vision), and multifocal optics (for distance and near vision).







This is the EyePrintPRO scleral lens made for a patient with a regular cornea. You can see that the lens incorporates many bumps. Even "normal" eyes are not perfect circles and have many irregularities that are difficult to see with the naked eye. These lenses provide the potential for more comfort than traditional contact lenses or even conventional scleral lenses.







Prism Correction









When Would I Use Impression-Based Lenses?

Patient has:

Gone through 500 other scleral lens designs with no lasting comfort

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- Large conjunctival abnormalities (pinguecula, scarring)
- Glaucoma filtering blebs close to limbus
- Poor vision with other scleral lenses
- Fogging unable to be resolved
- Very sensitive





Higher Order Aberration Correction





Higher Order Aberration Correction The Basics:

Measurement: HOA Correction begins with the measurement and analysis of the higher order aberrations present in the eye. This is typically done using wavefront aberrometry, which provides a detailed map of the individual's specific aberrations.

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- Enhanced Vision Quality: Aims to reduce symptoms such as:
 - halos
 - glare
 - decreased contrast sensitivity

















When Would I Use HOA Correcting Scleral Lenses?

Even with scleral lens correction, patient still has:

- Nighttime "glare"
- Halos around objects
- Extreme light sensitivity
- "Stretched out" or abnormal letters on eye chart
 - Sub-par vision in the absence of corneal scarring





Ocular aberrations characterize corneal pathologies.





Story Time:

- 78 y.o. male with 6 BO prism 1 BU OS. Used Ovitz multifocal and EyePrint to get 20/20 vision with no diplopia
- 65 y.o. male has "distorted vision" in his reading eye with pellucid marginal degeneration. Used HOA correction to take away distortions.
- Excessive flexure of lens (high hyperopes) with constantly alternating anterior surface toricity does better with scan or impression-based design



Thank You! Questions?

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