



**BAUSCH+LOMB**  
**Zenlens™**

**ADVANCED FITTING  
& TROUBLESHOOTING  
WITH ZENLENS™  
SCLERAL LENS**







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*[Speaker Name]* *[Presentation Date]*

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- Introduce yourself and the program.

## Topics covered

-  Zenlens™ scleral lens overview
-  Optical troubleshooting for scleral lenses
-  Troubleshooting the central and limbal vaults
-  Adjusting the Advanced Peripheral System (APS) for scleral alignment
-  Using technology to improve fitting success
-  Lens care

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1

Read to slide



# ZENLENS™ SCLERAL LENS OVERVIEW

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## Zenlens™ scleral lens standard customizable parameters

Diameters	14.8 mm	15.4 mm	16.0 mm	17.0 mm
Sagittal depth range	3500 to 5000 in 10-micron steps (fully customizable)		3200 to 6700 in 10-micron steps (fully customizable)	
Lens types	Prolate, toric		Oblate, prolate, toric	
	Also available: all-toric Zenlens™ fitting set			
Spherical powers	+20.00D to -20.00D			
Cylinder powers	-0.50D to -9.00D			
Advanced Peripheral System (APS)	Standard - Steep-10 to Steep-1 - Flat+1 to Flat+20			
Options*	Flexure control profile Custom center thickness Adjustable peripheral curves		Toric peripheral curves* Front toric Rx* MicroVault™ technology* Tangible® Hydra-PEG® coating*	
Available materials	Boston XO® with Dk 100 (Boston XO <sub>2</sub> ® with Dk 141 <i>on request</i> )			

\*Customization option available at an additional cost

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3

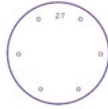
### Key Talking Points:

- Zenlens™ comes in 4 diameters—14.8 mm, 15.4 mm, 16.0 mm, and 17.0 mm—to help fit a range of patient eyes and conditions
- Zenlens™ also offers an all-toric fitting set, if that is an option you would prefer
- It includes a variety of feature options that help enable a successful fit to each unique patient's needs

For instance, select lens diameter based on corneal diameter measurement or estimation:

- For smaller corneas (11.7-mm HVID or smaller), the 16.0-mm design is recommended
- For larger corneas (11.8-mm HVID or larger), the 17.0-mm design is recommended

## Zenlens™ scleral lens markings



### Dx Lenses

- Six evenly spaced drilled dots at the beginning of the landing zone
- Laser-etched Dx number for positive ID



### Standard

- Drilled black dot on right lens OD (shown)
- No dots OS
- Laser-engraved ID
  - OD ends with 10
  - OS ends with 20



### Front Toric

- Two drilled lines at 0°/180° meridian
- Drilled black dot at 270° base OD (shown)
- Two drilled black dots at 270° base OS
- Laser-engraved ID at 90°



### Toric APS

- Two drilled lines at 0°/180° meridian will align to the corresponding axis of scleral toricity on the eye
- Drilled black dot at 270° base OD (shown)
- Two drilled black dots at 270° base OS
- Laser-engraved ID at 90°



### Toric APS w/Front Toric

- Two drilled lines at 0°/180° meridian will align to the corresponding axis of scleral toricity on the eye
- Drilled black dot at 270° base OD (shown)
- Two drilled black dots at 270° base OS
- Laser-engraved ID at 90°

**TIP:** The number at the 12 o'clock position is the same as the order number.

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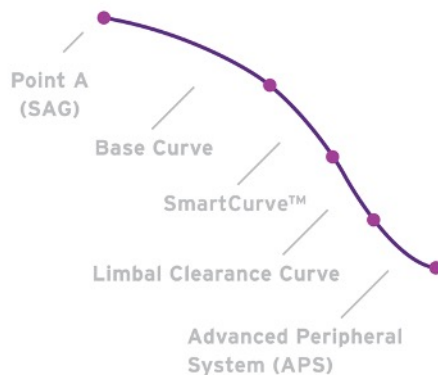
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4

### Key Talking Points:

- Each Zenlens™ lens has distinct markings that make it easier to clearly identify the lens type
- Each also has a diagnostic number on it as well
- The **drilled marking** on toric and multifocal lenses can help guide patient insertion

## Zenlens™ scleral lenses feature SmartCurve™ technology



- Simplifies the scleral fitting process
- Focus is only on the parameter needing modification
  - Other parameters automatically stay the same
- Especially convenient when the best-fit diagnostic lens requires SAG modification
  - Base curve remains constant
  - Fit and over-refraction remain valid

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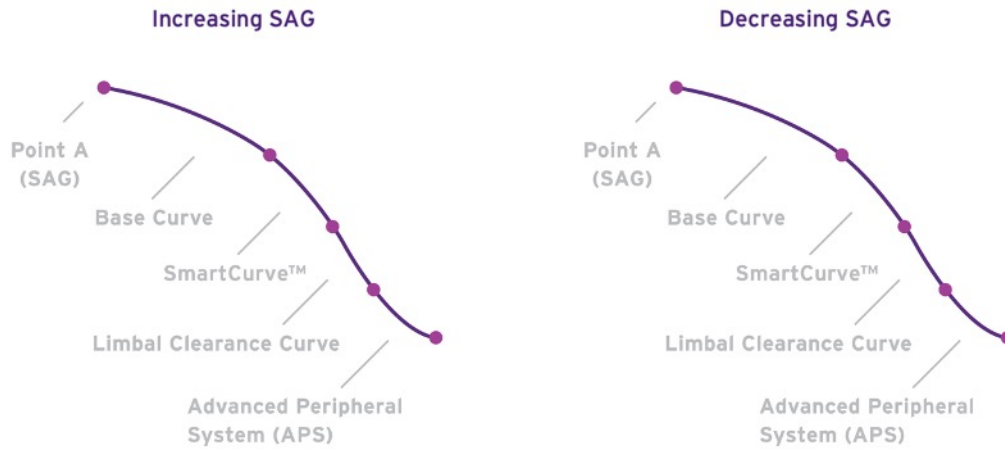
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5

### Key Talking Points:

- SmartCurve™ is the unique and proprietary technology used in Zenlens™ that enables you to modify parameters with precision. When a parameter is modified, SmartCurve™ technology automatically adapts to ensure most other design attributes remain consistent
- Point A represents the deepest point of the lens or central sagittal height
- The SmartCurve™ itself is based on a mathematical equation and cannot be adjusted by the practitioner
- In this example, you'll see the SmartCurve™ adjusting without impacting the rest of the curvature of the lens

## Zenlens™ scleral lenses feature SmartCurve™ technology



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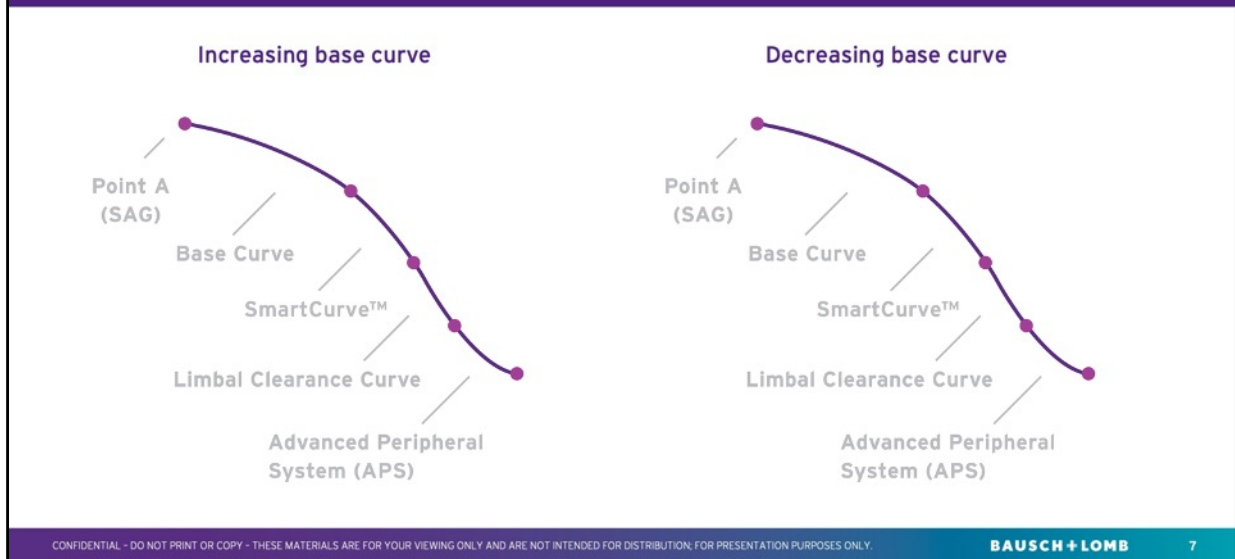
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6

### Key Talking Points:

- In this example, you'll see the lens SAG increasing on the left, and decreasing on the right, without impacting the rest of the lens

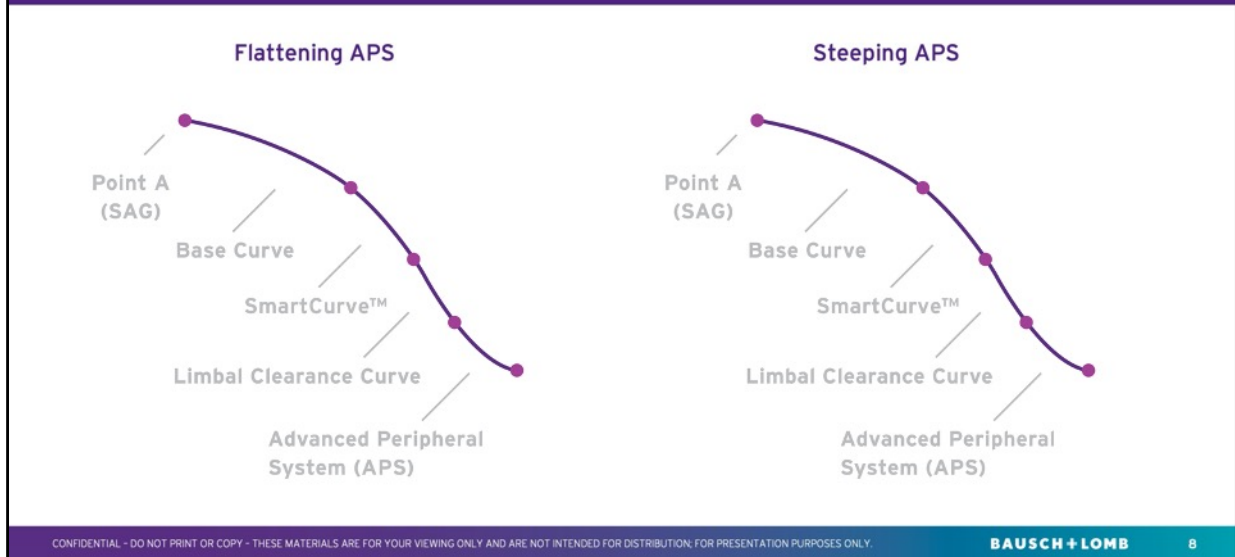
## Zenlens™ scleral lenses feature SmartCurve™ technology



### Key Talking Points:

- In this example, you'll see the base curve increasing on the left, and decreasing on the right, without impacting the rest of the lens

## Zenlens™ scleral lenses feature SmartCurve™ technology



### Key Talking Points:

- In this example, you'll see the APS flattening on the left, and steepening on the right, without impacting the rest of the lens

## Zenlens™ scleral lenses are available in prolate and oblate designs to accommodate most corneal shapes

### Prolate (Lens Z-3 as example)

Corrects both normal-shaped and irregular corneas

### Oblate (Lens Z-15 as example)

Choose for postgraft, postrefractive surgery, or corneal marginal degenerations



Important to maintain a more even tear layer behind the lens, which keeps the lens power in a manageable range

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### Key Talking Points:

- This is an example of how the prolate shape compares to the oblate shape
- Prolate lenses have central base curves that are steep, relative to a flatter periphery
- Oblate lenses have central base curves that are flat, relative to a steeper periphery
- For example, you may choose the prolate design for keratoconus or normal-shaped corneas with ocular surface disease. Or you may choose the oblate design for postgraft, postrefractive surgery, or corneal marginal degenerations

## Ability to further customize the lens design

### Optics

Adjustable  
peripheral curves

Customizable APS

MicroVault™  
technology



Spherical



Toric



Multifocal  
(spherical only)

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### Key Talking Points:

- If toric Rx is needed for vision, front toric optics can be added to the anterior optic zone
- Multifocal is an option, as well, and can be used with any diameter size. We will discuss more about the multifocal design and fitting later in this presentation

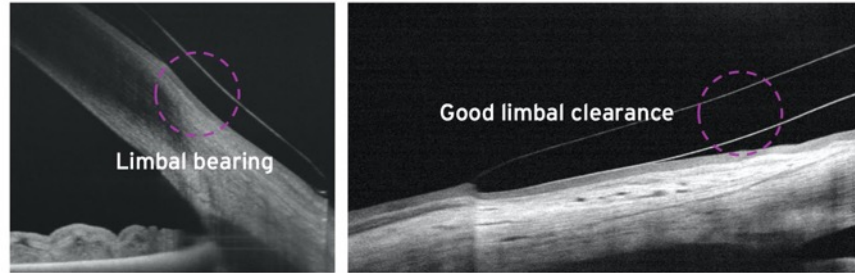
## Ability to further customize the lens design

Optics

**Adjustable  
peripheral curves**

Customizable APS

MicroVault™  
technology



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### Key Talking Points:

- Adjustable peripheral curves help with limbal clearance and can address any limbal bearing you may observe
- When fitting Zenlens™, the lens should exhibit clearance beyond the limbus. If a lens does not demonstrate full limbal clearance, ask for an increased limbal clearance as a custom parameter when ordering, or move to a larger diameter lens

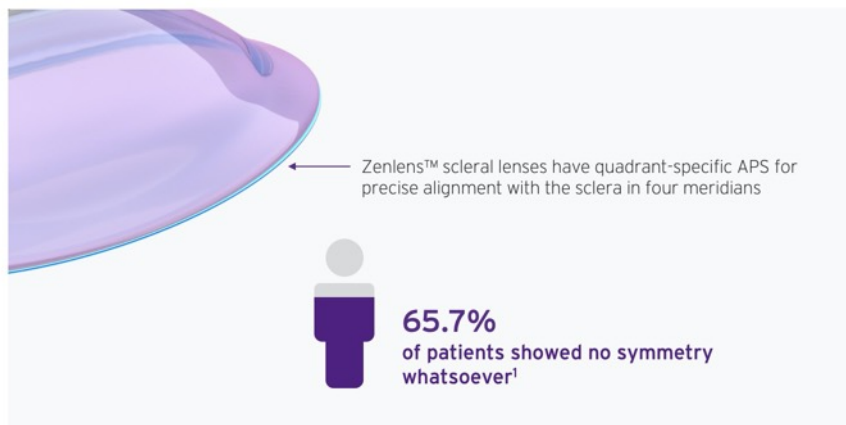
## Ability to further customize the lens design

Optics

Adjustable  
peripheral curves

Customizable APS

MicroVault™  
technology



REFERENCE: 1. DeNaeyer G, Sanders D, van der Worp E, Jedlicka J, Michaud L, Morrison S. Qualitative assessment of scleral shape patterns using a new wide field ocular surface elevation topographer: the SSSG study. *JCLRS*. 2017;10(1):e12-e22.

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12

### Key Talking Points

- Scleral profilometry, or topography, evaluated scleral shape and showed that the sclera is highly irregular. In a study by DeNaeyer, et al, only 65.7% of scleras were spherical in shape. 40.7% had asymmetric high points (or elevations) or asymmetric low points (or depressions), and 25% had a recognizable toric pattern with elevations and depressions, but were irregularly spaced or did not have the customary 180° periodicity
- Zenlens™ has a generous landing zone that, when properly fit, reduces air bubbles, lens impingement, and conjunctival impression rings
- Can be ordered flatter or steeper
- Quadrant-specific edge lifts maintain alignment with the sclera in four meridians— which is helpful, as a majority of patients show no symmetry (DeNaeyer, et al)
- For example, if you see bubbles under the lens, you may need to check for edge lift in one or more quadrants, and may require toric or steeper APS
- For blanching or redness, you may need to flatten the APS. But if blanching or redness occurs in opposing meridians, consider toric APS

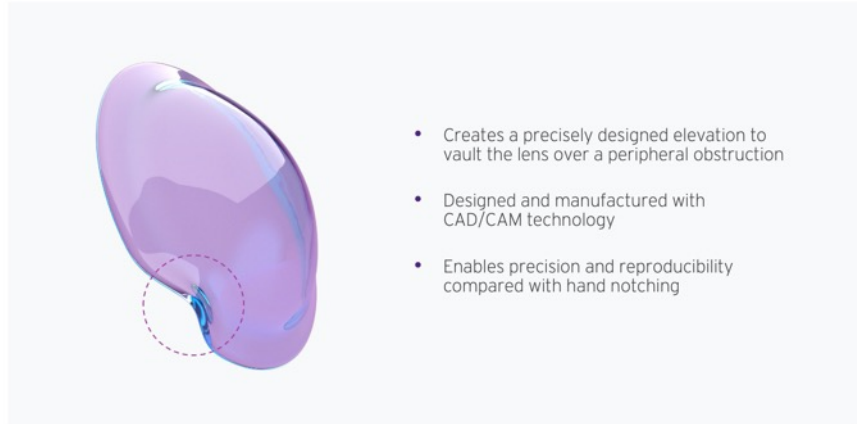
## Ability to further customize the lens design

Optics

Adjustable  
peripheral curves

Customizable APS

**MicroVault™**  
technology



- Creates a precisely designed elevation to vault the lens over a peripheral obstruction
- Designed and manufactured with CAD/CAM technology
- Enables precision and reproducibility compared with hand notching

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### Key Talking Points:

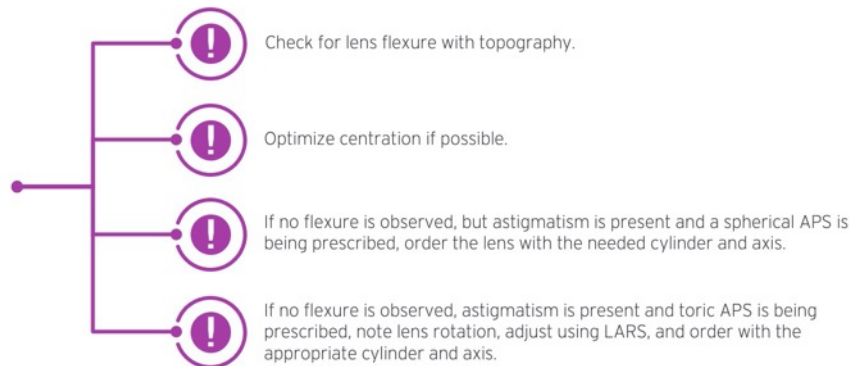
- Creates a precisely designed elevation to vault the lens over a peripheral obstruction
- Designed and manufactured with CAD/CAM technology
- Enables precision and reproducibility compared to hand notching
- Consultants can support non-edge peripheral elevations
- MicroVault™ technology can be applied to any design that has stabilization



**OPTICAL TROUBLESHOOTING  
FOR SCLERAL LENSES**

## Prescribing a front toric scleral lens

When an over-refraction reveals astigmatism, take these steps to manage properly



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15

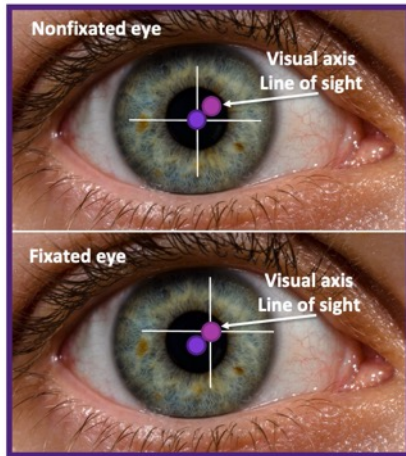
### Key Talking Points:

When an over-refraction reveals astigmatism, take the following steps to manage properly.

Before ordering a front toric scleral lens:

- Check for lens flexure with topography. If flexure exists, re-evaluate the scleral zone for proper fit and alignment. Flexure should not occur if the lens is properly aligned in the scleral zone
- Optimize centration if possible. This will reduce the measured astigmatism
- If no flexure is observed, but astigmatism is present and a spherical APS is being prescribed, simply order the lens with the needed cylinder and axis and the lens will be stabilized with front surface stabilization
- If no flexure is observed, but astigmatism is present and toric APS is being prescribed, note lens rotation, adjust using LARS, and order with the appropriate cylinder and axis

## Addressing and prescribing a multifocal scleral lens with decentered optics



### Impact of angle kappa

Studies have documented that the visual center (line of sight) is not centered geometrically within the pupil

According to a 2016 study of scleral lenses (Ramdass, et al) only 24% of 70 eyes "centered" at the one-month evaluation

- The visual axis is often displaced nasally and superiorly
- During the initial fitting process, achieving centration of the scleral lens is the primary goal

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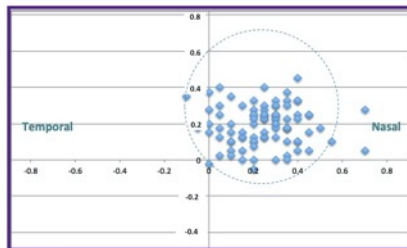
### Key Talking Points:

- Ramdass, et al, in a 2016 study of scleral lenses on regular corneas, demonstrated that only 24% of 70 eyes "centered" at the one-month evaluation. Others decentered temporally, inferiorly, or inferior-temporally
- The visual axis is often displaced nasally and superiorly, which is what you see in this right eye. This demonstrates the line of sight in a nonfixated eye, meaning the patient is simply looking out at no specific object in the distance
- When measurements are being taken on a patient, such as K readings, OCT, and topography, the observer asks the patient to look at a target in the instrument. For topography, this is typically a colored light source—usually a dot—for the patient to look at, which fixates the eye and the instrument along the visual axis. As previously explained, this is typically not along the optical axis of the eye. In the bottom image, we've now moved the crosshairs to intersect at the line of sight when the patient is looking into a topographer

## The Zenlens™ multifocal scleral lens places the near zone slightly nasally and superiorly for each eye

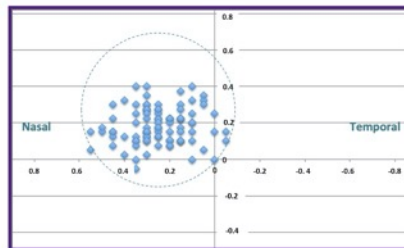
To develop optimized optics for the Zenlens™ multifocal, a study used topography to measure the visual axis (line of sight) as compared to the optical axis and anatomical center of the cornea

Right Eyes



Right eyes (n=90)  
Superior decentration = 0.191 mm  
Nasal decentration = 0.247 mm

Left Eyes



Left eyes (n=90)  
Superior decentration = 0.185 mm  
Nasal decentration = 0.247 mm

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### Key Talking Points:

- Dr. Jason Jedlicka documented the visual axis (line of sight) in a study of 90 subjects at Indiana University
- Using topography, he measured the visual axis as compared to the optical axis and anatomical center of the cornea
- When averaged, the results in this cohort showed superior decentration of the visual axis of 0.191-mm OD and 0.185-mm OS, respectively, with nasal decentration in each eye averaging 0.247 mm
- The Zenlens™ multifocal design aligns the near zone over the visual axis instead of the pupillary axis, which in soft lens studies provides clear near vision

## Achieving a better fit for Zenlens™ multifocal scleral lens with decentered optics



Once you obtain a good fit for the scleral lens, obtain the presbyopic data



Over-refract for best distance vision first, using sphere powers only



Adjust near zone size for each eye

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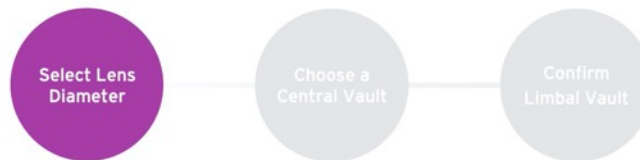
### Key Talking Points:

- The scleral lens fit should be achieved first—either through the diagnostic lens fitting process or a currently well-fitted lens
- Blended concentric optics with a center-near zone is used for each eye
- Since scleral lenses don't move much or translate on-eye during blinking, a simultaneous vision approach with center-near zones is used for each eye
- Typically, the dominant eye will have a slightly smaller near zone
- Standard zones:
  - Dominant eye: 1.5-mm center-near zone
  - Nondominant eye: 2.0-mm center-near zone
- Read the fitting process overview:
  - 1. Once you obtain a good fit for the scleral lens, obtain the presbyopic data**
    - Dominant eye
    - Pupil size in normal room illumination
    - Rotation of the lens (if toric APS)
  - 2. Over-refract for best distance vision first, using sphere powers only**
    - The Add power for the nondominant eye matches spectacle Add, while the dominant eye is 0.5 diopter less
  - 3. Adjust near zone size for each eye**
    - Zone sizes can be customized based on pupil size or visual demand
    - Pupil size, dominance, prescription, Add power, BCVA restrictions, and lens rotations are what consultants will need when you place an order for a multifocal Zenlens™. A consultant will be happy to assist you to answer any fitting questions regarding these variables.



**TROUBLESHOOTING THE CENTRAL  
AND LIMBAL VAULTS**

## Selecting the proper lens diameter



### HVID 11.7 mm and smaller

- 16.0-mm diameter lens
- 14.8-mm diameter lens

### Cornea Size

### HVID 11.8 mm and larger

- 17.0-mm diameter lens
- 15.4-mm diameter lens

### Key Talking Points:

- The first step in fitting a scleral lens is to select a diameter
- Scleral lenses are designed to fully vault the cornea and limbus to land on the sclera. Therefore, corneal diameter determines the lens diameter
- Other factors to consider when choosing a lens diameter are disease severity, the condition being treated, and the availability of diagnostic lenses
- When selecting a diameter size for Zenlens™ scleral lenses, it is important to look first at the HVID to determine the proper starting point
- Then, depending on the shape of the cornea, determine what provides the best fit
- With the wrong diameter, the lens might hit or overvault the limbus and can create a depth that is inappropriate. This may result in too much or not enough limbal clearance
- For example, the 15.4-mm diameter has a LARGER chamber for vaulting the cornea than the 16.0-mm, but the 15.4-mm will also have considerably less area for landing. So, looking at the required vault over the limbus will factor into a final diameter selection

## What is the right amount of central vault?



Target an initial vault of approximately 300-350 microns immediately after application

If central vault is close to target, allow to settle for 20 to 30 minutes to verify remaining fit parameters

At follow-up, allowing for full settling, vault should be between 150-250 microns

### Key Talking Points:

- Scleral lenses need time (20 to 30 minutes) to settle into the conjunctiva, so waiting to assess clearance is important. Some practitioners may choose to wait up to 60 minutes or more for the lens to settle
- The lens should contour but not touch the cornea and, when possible, there should be an even layer of postlens clearance
- Lenses should be fitted to allow for clearance. If there is insufficient clearance, the sagittal height and/or limbal clearance should be increased to take into account further settling with longer wear times
- The final clearance for the lens should follow its fitting guidelines

### Settling considerations:

- Over-refraction is not affected by lens settling. It should be the same, whether done at application or 1 hour later
- Larger lens diameters typically don't settle more over time

## What is the right amount of limbal vault?

Select Lens Diameter

Choose a Central Vault

Confirm Limbal Vault

Limbal vault at application should be roughly 50 microns on average, keeping in mind it is rarely symmetric around the cornea

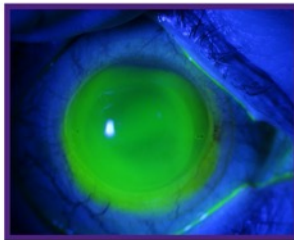


Image courtesy of Jason Jedlicka, OD

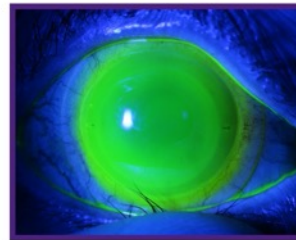


Image courtesy of Jason Jedlicka, OD

Verify limbal clearance by moving the lens into a centered position over the cornea before making adjustments

### Key Talking Points:

- Limbal vault at application should be roughly 50 microns on average, keeping in mind it is rarely symmetric around the cornea
- Verify limbal clearance by moving the lens into a centered position over the cornea before making adjustments
- Decreasing the vault of the lens to the shallowest acceptable fit doesn't prevent fogging but can limit the amount of debris that is trapped under the lens, which will improve the wearing experience
- With limbal bearing, the lens can cause staining or corneal bullae, and edge lift may occur
- Excess limbal clearance can result in lens decentration, corneal hypoxic stress, or conjunctival prolapse



**ADJUSTING THE APS FOR  
SCLERAL ALIGNMENT**

## APS analysis: Is the lens moving?

Scleral lenses should be **stable** and show **minimal movement**!



### Indications to modify the APS:

- Moves with eye movement or blink
- Post-lens tear layer fogging
- Blanching or impingement
- Edge lift

An example of excessive lens movement



Reference: 1. Johns LK, et al. Scleral lens evaluation. In: Barnett M, Johns LK, eds. *Ophthalmology: current and future developments*. Volume 4. *Contemporary scleral lenses: theory and application*. Sharjah, UAE: Bentham Science Publishers; 2017.

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24

**Note to speaker: This slide contains a video that will play automatically and continuously loop. Sound should be muted, but please double-check that the sound is off**

### Key Talking Points:

- The lens should be stable and show minimal movement. A moving lens would indicate the lens is not yet properly aligned to scleral surface
- Movement can cause lens awareness, excessive tear exchange, debris accumulation, and visual fluctuation
- All meridians are not required to be perfectly tangent to the sclera
- Some tear exchange is desirable
- Always remove the lenses yourself at the visit to assess degree of tightness
- Look for excessive fluorescein staining, especially over the limbus and conjunctiva
- Presence of an impression ring after removal is indicative of impingement
- If only in one meridian, quadrant-specific APS may be indicated
- Consultation with lab consultants is always a good idea

## Assess lens edge to identify location where debris may be entering post-lens tear layer (PLTL)

### Fluorescein placement on surface



Image courtesy of Jason Jedlicka, OD

### Visual of NaFL seeping

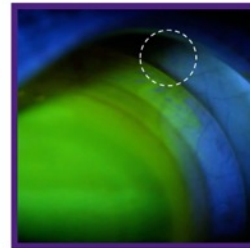


Image courtesy of Jason Jedlicka, OD

To evaluate for excessive exchange due to edge lift, fluorescein can be painted on the front surface of the lens or on the superior conjunctiva and then watched to see where the tear exchange is occurring<sup>1</sup>

A steeper APS, either 360 degrees or meridian-specific (toric APS), would be necessary, depending on where the tear exchange is occurring<sup>1</sup>

**REFERENCE:** 1. Johns LK, et al. Scleral lens evaluation. In: Barnett M, Johns LK, eds. *Ophthalmology: Current and Future Developments. Volume 4. Contemporary Scleral Lenses: Theory and Application*. Sharjah, UAE: Bentham Science Publishers; 2017.

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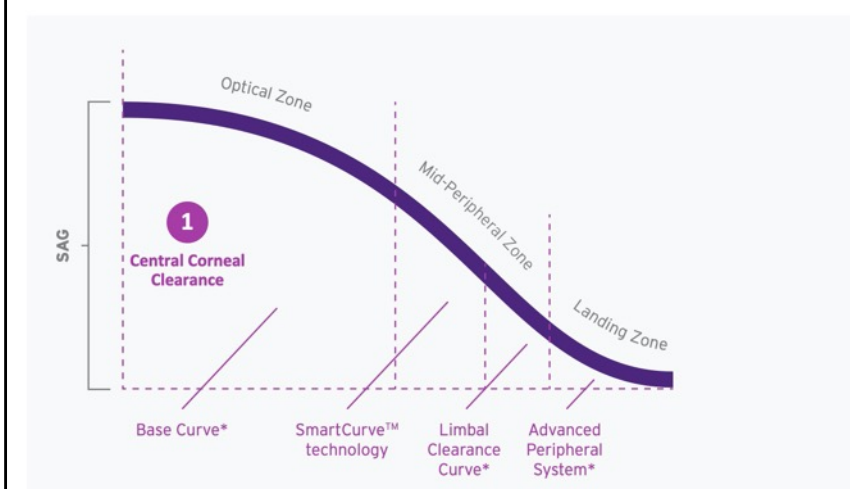
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25

### Key Talking Points:

- Post-lens tear layer (PLTL) fogging can be caused by a landing zone that poorly aligned, allowing debris to be pulled in, and can be made worse by lens movement
- Fogging can be caused from excessive overvaulting centrally, if the landing zone is too steep or there is narrow surface contact, or from excessive exchange due to edge lift
- To evaluate for excessive exchange due to edge lift, fluorescein can be painted on the front surface of the lens or on the superior conjunctiva and then watched to see where the exchange is occurring
- A steeper APS would be necessary, either 360 degrees or meridian-specific (toric APS), depending on where the exchange is occurring
- ECP should inform that a non-preserved saline should be used
- ECP should stay in the chair after coating the lens with fluorescein, and watch specifically for where it leaks behind the lens

## Assessing APS misalignment before adjusting limbal clearance



- A misaligned APS will often result in a low-fitting lens, due to gravity

\*These are the Bausch + Lomb terms for these curves. Other manufacturers may call them by other names.

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### Key Talking Points:

- Lens drop will create an asymmetric PLTL, resulting in minimal to no limbal clearance superiorly and excessive limbal clearance inferiorly
- A prism-shaped tear layer should be a red flag that you have a low-centered lens

Do not increase limbal clearance until the lens edge is optimized

- Check for excessive clearance in one meridian and minimal clearance in another meridian—the lens is typically decentered
- If limbal clearance is increased first, it will only make the fit worse

### Notes:

Ensure the lens is centered by a good fit or by pushing up with the lower lid or finger to properly evaluate limbal clearance

Always make adjustments based on a properly centered lens

- A poor edge fit will often lead to the perception of inadequate limbal clearance
- Confirm appropriate diameter, as increasing limbal clearance only changes angle of approach, not point of landing

## Conjunctival prolapse

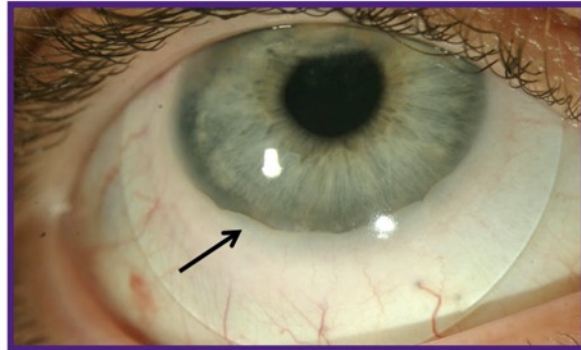
Conjunctival prolapse occurs over an area of the cornea that is significantly shallower than the surrounding tissue, such as a corneal transplant or pellucid marginal degeneration.



A tight edge (or periphery) can be a cause, whereas flattening the edge or reducing limbal clearance will reduce or eliminate the prolapse



Review the central clearance and limbal clearance to see if there is room to bring one or both down



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### Key Talking Points:

- Conjunctival prolapse is generally an indication that a portion of the lens is too steep or overvaulted in the area of prolapse. This creates a void in the PLTL where loose conjunctival tissue is pulled up underneath the lens
- It is helpful to review the central clearance and limbal clearance to see if there is room to bring one or both down
- A tight edge (or periphery) can also create conjunctival prolapse, and sometimes flattening the edge will reduce or eliminate the prolapse
- Appropriate lens parameters should be made to best eliminate or reduce the amount of conjunctival prolapse if possible
- The prolapse should be monitored at each visit

## Application of MicroVault™ technology to the APS



MicroVault™ technology creates a precisely designed flute or ripple in the edge of Zenlens™ to vault the lens up and over the peripheral obstruction



MicroVault™ technology can be applied to any Zenlens™ design that has been stabilized with a toric APS or front prism ballast



MicroVault™ technology can be specified inside of the lens (i.e, not at the edge) if required  
*Consultation can assist in these cases*

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### Key Talking Points:

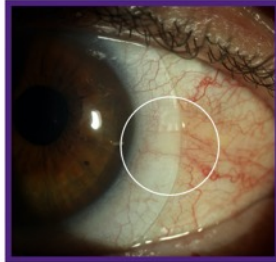
- Zenlens™ scleral lenses have MicroVault™ technology, which is an innovation for dealing with pingueculae or other peripheral elevations that might otherwise interfere with a proper landing on the sclera

## Pinguecula and impingement example

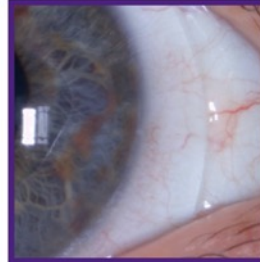
Compression of pinguecula



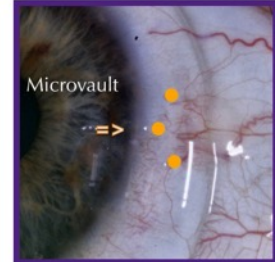
Pinguecula with MicroVault™ technology



Impingement



Impingement with MicroVault™ technology



Images courtesy of Tom Arnold, OD, FSLC; Lynette Johns, OD, FAAO, FSLC, FBCLA

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### Key Talking Points:

- MicroVault™ technology can help bridge over a peripheral elevation, like a pinguecula, or an internal elevation, like a nodule. Consultation can help design a lens with this feature

## Measuring for MicroVault™ technology



### Depth Parameter

1. Approximate how high the elevation is to determine the depth
2. Keep in mind that 900 microns is the maximum depth

*Note: Depth can be precisely measured with an anterior segment OCT*



### Width Parameter

1. Determine the widest point of the elevated obstacle
2. Using a slit-lamp reticle or the beam of the light, measure the maximum width desired

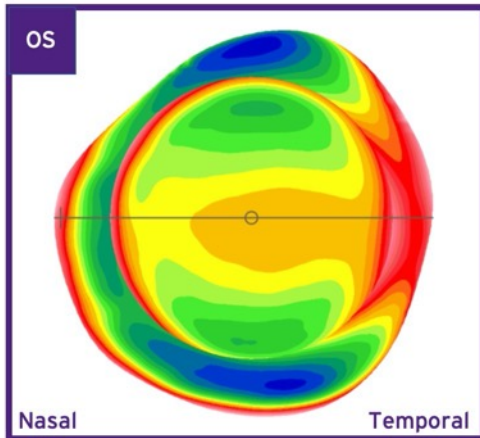


### Decentration Parameter

1. Measure the distance from optical center to point of highest elevation
2. If obstacle is at the lens edge, the highest elevation of the MicroVault™ technology is at the lens edge
3. If the obstacle is under the lens, measure the distance from the edge to the peak of the center of the elevated obstacle

Read to slide

## Application of Quad-Sym APS on patients



### Scleral Topography

- Superior and inferior quadrants are deeper
- Nasal is slightly more elevated
- Temporal is very elevated

Read to slide



**USING TECHNOLOGY TO IMPROVE  
FITTING SUCCESS**

## Using OCT imaging as part of an empirical fitting approach

### **Anterior segment OCT imaging can provide benefits for both pre- and post-contact lens assessment:**

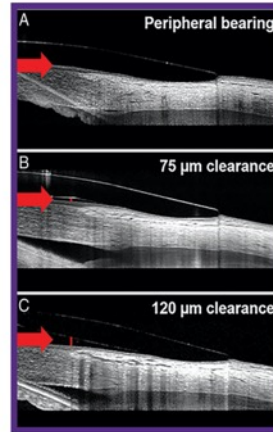
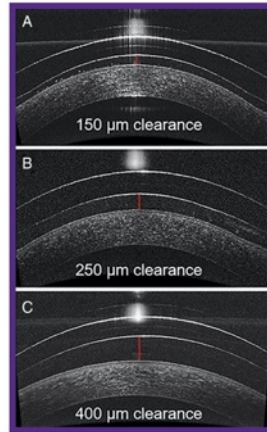
- Evaluating pachymetry and corneal edema
- Objectively assessing the central and limbal clearance
- Examining lens edges for flaws and causes of discomfort (heel down, toe down)
- Measuring scleral surface elevations (eg, pingueculae)
- Assessing points of lens bearing to determine the need for design modification

Read to slide

## Viewing central and limbal clearances with OCT

Example OCT line scan images demonstrating variation in initial central clearance for various miniscleral contact lenses of different sagittal depths fitted to a normal cornea

- A: 150-microns
- B: 250-microns
- C: 400-microns apical clearance



Example OCT images highlighting variations in peripheral, corneal, and limbal clearance in the same eye for alternative lens designs

- A: Peripheral lens bearing
- B: 75-microns
- C: 120-microns limbal clearance

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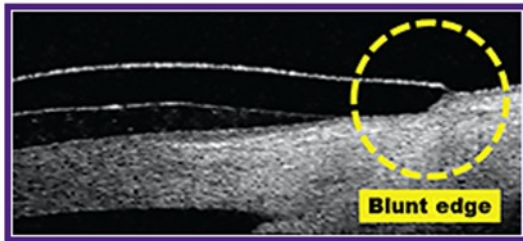
34

### Key Talking Points:

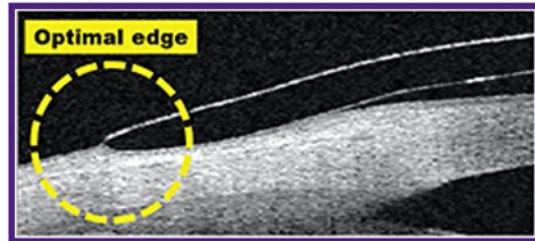
- Although an OCT image is being used on this slide, indicate that, on the patient's first return to the office after the initial lens is dispensed, it is possible and suggested to evaluate the lens using fluorescein with the slit lamp

## Assessing the lens edge with OCT

When patients have complaints of contact lens discomfort and the slit-lamp findings are inconclusive, we often question the quality of the lens edge. Having the patient fixate off-center during OCT image capture allows us to view the edge profile in cross section.



A poorly manufactured lens edge, resulting in a blunt tip with acute points

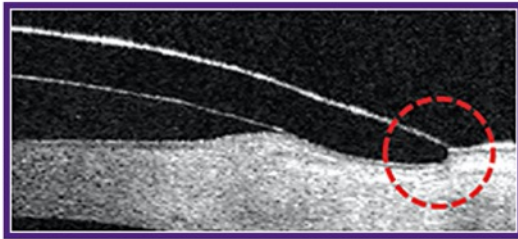


An optimally finished edge with a well-rounded tip

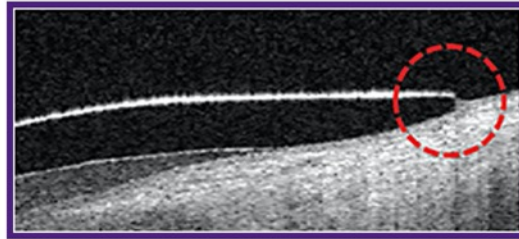
Read to slide

## Assessing the lens edge with OCT

Another valuable OCT application related to specialty contact lens fitting is the assessment of lens edge. The slit lamp can explain gross problems with the fit of our lenses relatively easily. However, it can be ambiguous in its determination of finite imperfections in the lens.



A scleral lens edge sinking into the conjunctiva at the tip, causing a constriction of the vessels visible with a slit lamp



An optimal edge relationship between lens and bulbar conjunctiva

Read to slide

## Using an anterior segment camera for lens edge and scleral surface assessment



Angled light allows viewing of the lens edge



Ability to see the wettability on the lens surface

Read to slide

## Leveraging topography for complex cornea shapes



### Oblate or Prolate

Patients with keratoconus and postsurgical ectasia can be best fit with either a prolate or oblate lens design

Tangential and elevation topographical mapping may help decide which design to use



### Selecting Scleral Zone Shape

Scleral topographers can image beyond the cornea and provide information about the scleral shape

This information can aid in the design of the APS



### Optical Centering for Multifocal

Take your multifocal prescribing to the next level by imaging the lens surface to determine if the optics are lined up with the patient's line of sight

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### Key talking points:

- Sometimes it's difficult to select prolate or oblate lens shape based on diagnosis alone

## Using topography for optical centering of multifocal for line of sight

Topographical maps can be helpful in demonstrating the location of multifocal optics on the eye

MF optics geometrically centered on lens

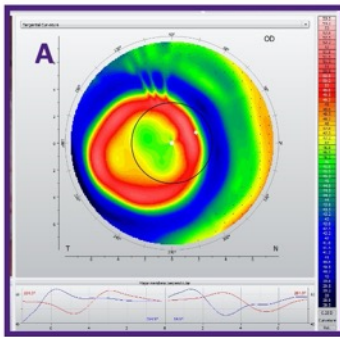


Image A is a centered near zone in a lens that has decentered down and out

0.5-mm decentration at 45°

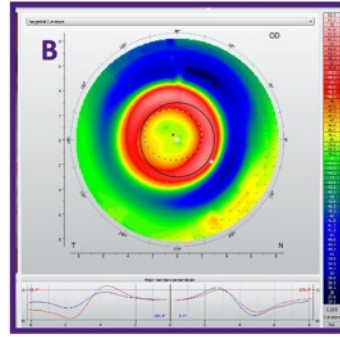


Image B is the same lens with decentered optics at 45°, aligning the position of the zone over the pupil

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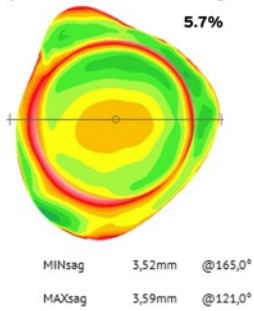
39

### Key talking points:

- These tangential maps were acquired over the surface of the lens on a patient's right eye
- The black circle indicates the pupil; the red circle surrounds the near zone

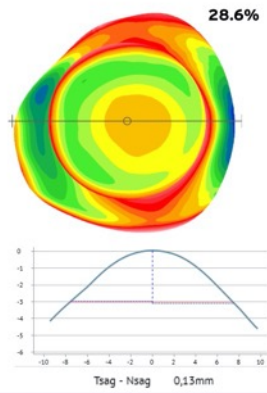
# Examples of elevation map on patients

1. Spherical

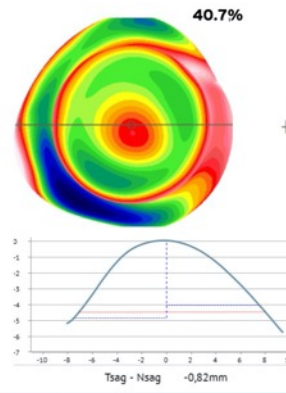


Images Courtesy of Eaglet

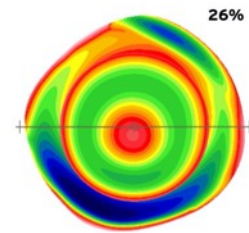
2. Regular toric



3. Asymmetric elevations or depressions



4. Irregular toric



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PATIENT LENS CARE

## Determining dryness

If a patient is exhibiting or mentions dryness, you may consider:

- Medications
- Plugs
- Allergies
- Makeup/skin creams
- Diet
- Solutions
- Tangible® Hydra-PEG®



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## Dryness and wettability of the lens surface

If the tear layer is breaking up and water pulls away, look at how the patient is wetting the surface of the plunger/applicator

### Applying Lenses



Rinse lens with ScleralFil® preservative-free saline solution.



Set the lens on the center of the plunger.



Fill the lens with ScleralFil®, forming a convex shape. Don't let it overflow.



### Tips for wettability

Make sure the applicator tool is clean and is covered in lubricant prior to lens placement

Cutting off the bottom helps with lens surface issues, as the suction of the tool can hinder lens surface wetting

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### Key Talking Points:

- Ensure the plunger is sanitized

## What is Tangible® Hydra-PEG®?



- Tangible® Hydra-PEG® is a 90% water-polymer mixture that is bonded to the surface of the scleral contact lens
- The optically clear coating encapsulates the lens with a mucin-like hydrophilic shell
- When treated with Tangible® Hydra-PEG®, the underlying material is encapsulated in a thin layer of polymer that results in measurable improvement of wettability compared with untreated lenses

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### Key Talking Points:

- Tangible® Hydra-PEG® is a 90% water-PEG-based-polymer mixture that is covalently bonded to the surface of the contact lens, effectively creating a wetting surface on the underlying lens material and separating it from the ocular surface and tear film. The optically clear coating encapsulates the core contact lens with a mucin-like hydrophilic shell
- When treated with Tangible® Hydra-PEG®, the underlying material is encapsulated in a thin layer of polymer that results in measurable improvement of wettability (sessile drop contact angle) compared with untreated lenses
- The coating technology and process is owned by Tangible® Science, and Bausch + Lomb (Alden Optical lab) will apply it to lenses under license from Tangible® Science
- A lens must be made with Tangible® Hydra-PEG®; it cannot be added to an existing lens

## Removing the lens



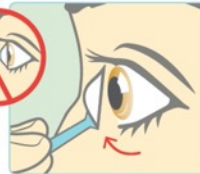
Insert 1 to 2 drops of rewetting drops to help loosen the lens



Wet the plunger with 1 to 2 drops of rewetting drops



Gently attach the plunger to the edge (NOT the center) of the lens



Gently tilt the lens up and out and carefully remove it from your eye

Placement of the removal plunger



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### Key Talking Points:

- Practitioners should carefully follow these steps when removing scleral lenses from a patient

## Handling tips for patients who have difficulty with inserting the lens



Patients with tremor



Elderly patients



Patients with very poor vision



REFERENCE: Barnett M., Johns LK, Handling Challenges. In: Barnett M, Johns LK, eds. Ophthalmology: Current and Future Developments. Volume 4. Contemporary Scleral Lenses: Theory and Application. Sharjah, UAE: Bentham Science Publishers; 2017.

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### Key talking points:

- Handling is one of the most common reasons for scleral lens dropout
- There are some scleral lens tools that can be used to benefit patients who have difficulty with inserting their lenses
- A scleral lens inserter can help patients with unsteady hands insert their lenses
- A scleral lens applicator, placed on the finger like a ring, can provide stability and allow patients to apply their scleral lenses with one finger
- Large books may be able to help stabilize the arm for patients with tremor
- The practitioner is responsible for helping their patients with scleral lens handling and care

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Highly skilled  
and recognized



Extended consultancy hours  
8 AM to 7 PM EST



An average of 25 years  
of experience

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### Key talking points:

- Vision consultants offer on-demand, individualized support and fitting solutions for even extremely challenging cases
- Experts in helping you achieve patient comfort and satisfaction

## Safety information for eye care professionals

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### Important Safety Information for Gas Permeable and Customized Soft Contact Lenses

#### WARNINGS:

- Patients should be advised of the following warnings pertaining to contact lens wear:
  - Problems with contact lenses and lens care products could result in serious injury to the eye. It is essential that patients follow their eye care practitioner's directions and all labeling instructions for proper use of lenses and lens care products, including the lens case. Eye problems, including corneal ulcers, can develop rapidly and lead to loss of vision.
  - Daily wear lenses are not indicated for overnight wear, and patients should be instructed not to wear lenses while sleeping. Clinical studies have shown that the risk of serious adverse reactions is increased when daily wear lenses are worn overnight.
  - Studies have shown that contact lens wearers who are smokers have a higher incidence of adverse reactions than nonsmokers.
  - If a patient experiences eye discomfort, excessive tearing, vision changes, or redness of the eye, the patient should be instructed to immediately remove lenses and promptly contact his or her eye care practitioner.

Speak to slide

## Safety information for eye care professionals (cont.)

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### **CONTRAINDICATIONS:**

- Do not use when any of the following conditions exist:
  - Acute or subacute inflammation or infection of the anterior chamber of the eye
  - Any eye disease, injury or abnormality, other than keratoconus, PMD, that affects the cornea, conjunctiva, or eyelids
  - Severe insufficiency of lacrimal secretion (dry eye)
  - Corneal hypoesthesia (reduced sensitivity), if not aphakic
  - Any systemic disease that may affect the eye or be exaggerated by wearing contact lenses
  - Allergic reactions of ocular surfaces or adnexa that may be induced or exaggerated by wearing contact lenses or using contact lens solutions
  - Allergy to any ingredient in a solution which is to be used to care for contact lenses
  - Any active corneal infection (bacterial, fungal, or viral)
  - Red or irritated eyes

Speak to slide

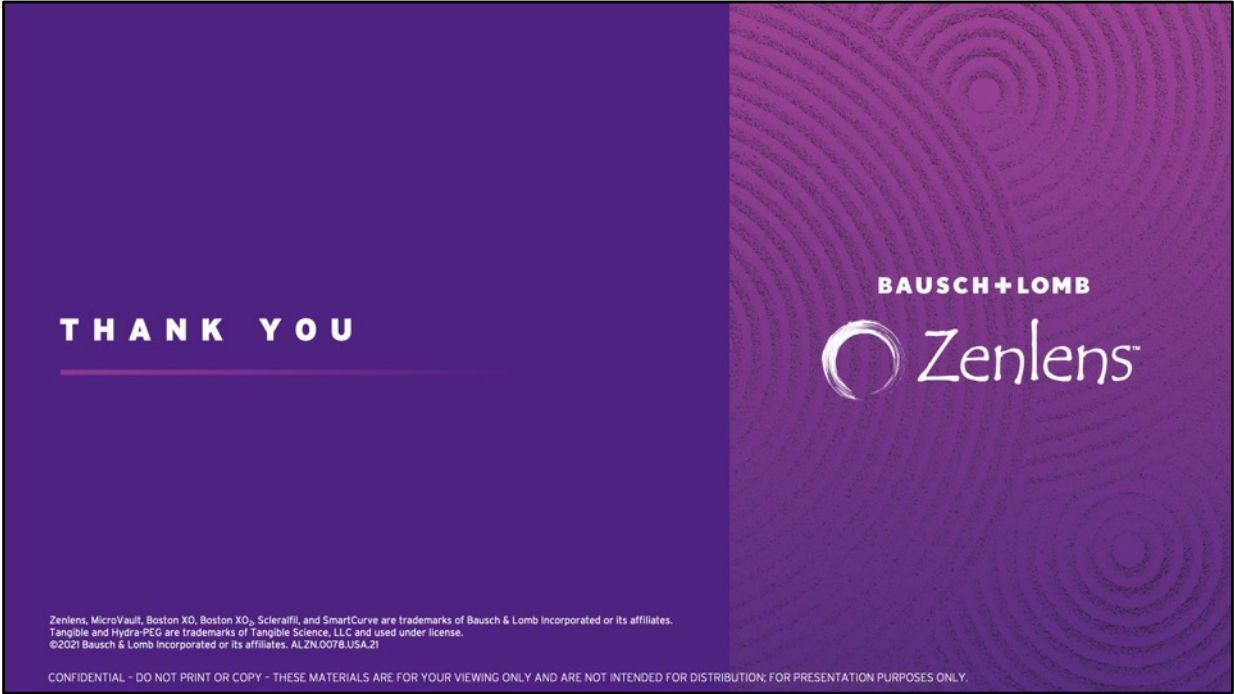
## Safety information for eye care professionals (cont.)

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### **ADVERSE EFFECTS:**

- The following problems may occur with the use of contact lenses:
  - Eyes stinging, burning, itching, irritation, or other eye pain
  - Comfort is less than when the lens was first placed on the eye
  - Feeling of something in the eye such as a foreign body, scratched area
  - Excessive watering (tearing) of the eye
  - Unusual eye secretions
  - Redness of the eyes
  - Reduced sharpness of vision (poor visual acuity)
  - Blurred vision, rainbows, or halos around objects
  - Sensitivity to light (photophobia)
  - Dry eyes

Speak to slide



Thank you.