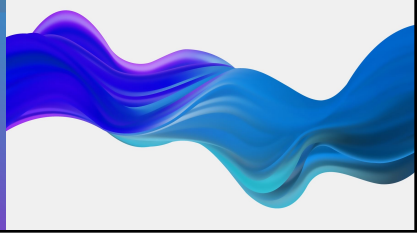
SHAPE UP YOUR SCLERAL LENS FITTING



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INDIANA UNIVERSITY

1

DISCLOSURES

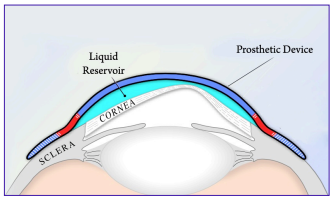
- Bausch and Lomb
- Oculus
- Ovitz
- Esslior
- Tangible Sciences
- Eaglet Eye

2

FITTING A SCLERAL LENS

- Vault the cornea
- Don't compress the limbus
- **Align the Sclera**

Aligning the lens to the scleral shape is the most complex aspect of fitting a scleral lens



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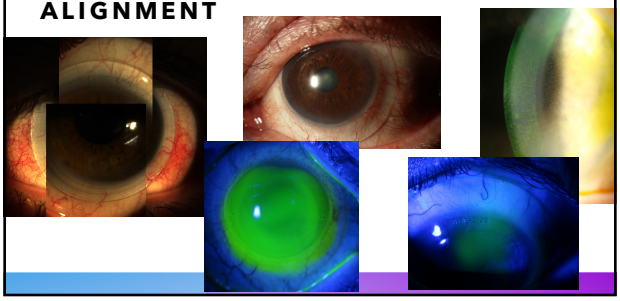
COMPLICATIONS OF POOR SCLERAL ALIGNMENT



4

THE ANTERIOR EYE

- The cornea and sclera are relatively continuous
- The conjunctiva overlying the sclera is somewhat unpredictable
- When we image the ocular surface we are imaging the cornea and the conjunctiva surfaces
- **The sclera gives its shape to the eye, but ultimately, the conjunctiva has an influence**

Digital Histology - VCU

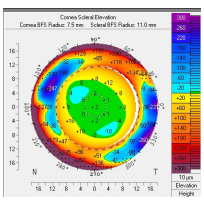
5

OCULAR SURFACE SHAPE

The cornea has a relatively fixed shape

The sclera has a relatively fixed shape

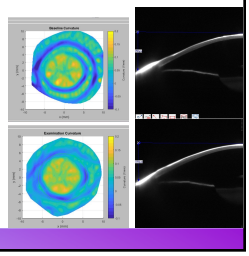
The conjunctival thickness can vary and affect the "scleral shape"



6

REDUCING THE IMPACT OF TRANSIENT CONJUNCTIVAL THICKNESS CHANGES

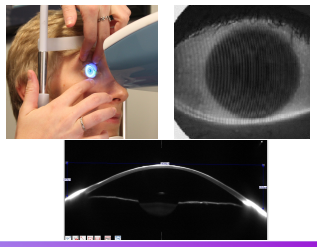
- For most accurate scleral shape data, discontinue ALL contact lens wear (including soft lenses or corneal GP's) for at least 36 hours prior
- For eyes with ANY signs of conjunctival aggravation (inflammation, 3-9 staining, edema, chemosis, etc…) treat with topical steroid for at least a few days prior to imaging as well



7

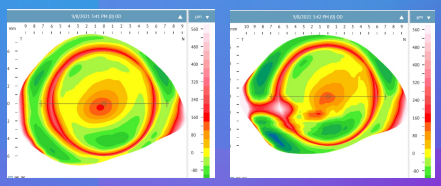
MEASURING OCULAR SURFACE SHAPE

- Reflection based systems rely on Fluorescein and are tear layer dependent
- Scheimpflug systems do not require Fluorescein and are not tear layer dependent



8

USING OCULAR SURFACE SHAPE DATA FOR BETTER OUTCOMES

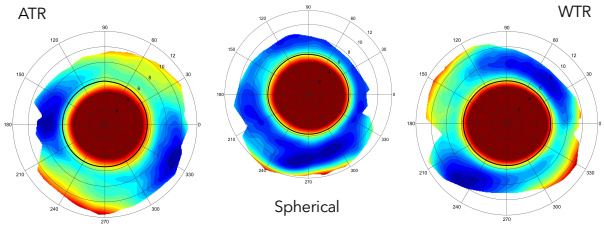


GET GOOD MAPS!

9

SCLERAL TOPOGRAPHY: WHAT DO WE SEE?

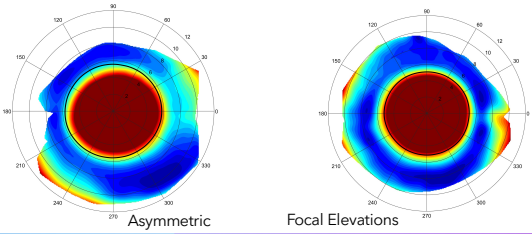
ATR WTR



Spherical

10

SCLERAL TOPOGRAPHY: WHAT DO WE SEE?



Asymmetric Focal Elevations

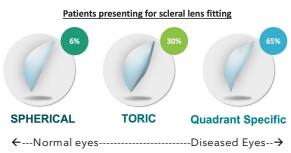
11

SCLERAL SHAPE: WHAT DO WE KNOW?

QUALITATIVE ASSESSMENT OF SCLERAL SHAPE PATTERNS USING A NEW WIDE FIELD OCULAR SURFACE ELEVATION TOPOGRAPHER: THE SSSG STUDY

By Gregory DeNaeyer, OD[1], Donald R. Sanders, MD, PhD[2], Eef van der Worp, OD[3], Jason Jedlicka, OD[4], Langis Michaud, OD[5], Sheila Morrison, OD[6]

- 140 eyes measured at 16 mm chord
  - 5.7% "spherical"
  - 28.6% "regularly toric"
  - 40.7% "asymmetric toric"
  - 26% "irregular"



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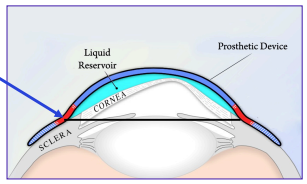
SCLERAL LENS DESIGN

- Remember that scleral lenses are designed to vault up to a specific point and then to rest on the eye
- The lens has a single SAG at this point
- The eye does NOT



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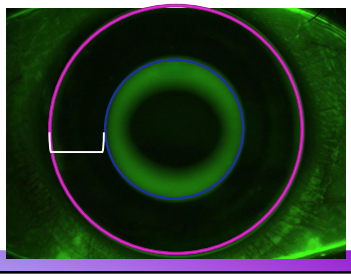
ALIGNMENT.. THE ORTHO K EXAMPLE

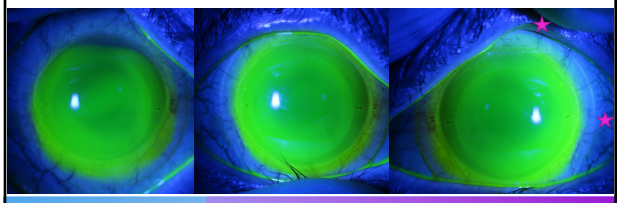
- A proper ortho-k lens fit will maximize the surface area of the alignment zone
- In order to get a proper scleral lens fit, we should strive for the same thing in the scleral landing zone



14

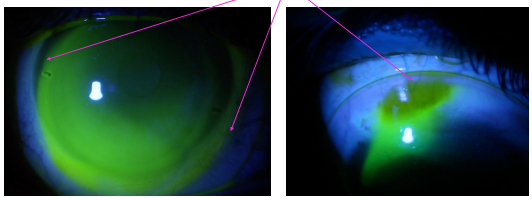
SCLERAL LENSES TYPICALLY DO NOT LAND EVENLY AT THE POINT THEY ARE INTENDED TO LAND

- Decentered
- Pushed to centration
- Note landing H vs V



15

SCLERAL LENSES TYPICALLY DO NOT LAND EVENLY AT THE POINT THEY ARE INTENDED TO LAND



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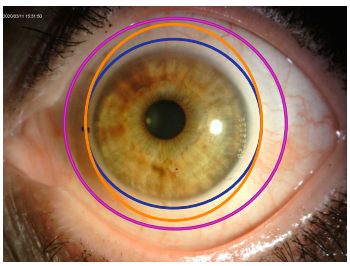
ALIGNING THE SCLERA

- With scleral lenses, we tend to focus entirely on scleral shape and forget the cornea is a big contributing factor
- We should be trying to get not just the edges of a scleral lens to touch evenly, but to maximize the surface area of the alignment zone
- When we don't land the lens evenly 360 degrees, we end up with one meridian of minimal alignment



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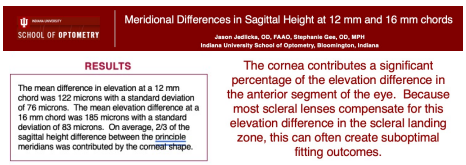
ALIGNING THE SCLERA IS MORE THAN JUST THE SCLERAL SHAPE

- It involves understanding the shape of the eye inside the VAULTING CHAMBER and understanding the shape of the eye in the SCLERAL LANDING ZONE



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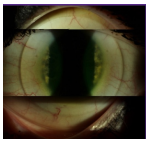
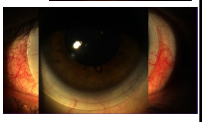
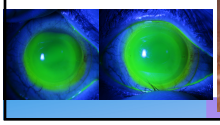
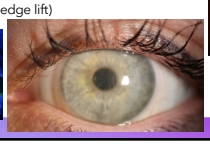
GETTING SCLERAL ALIGNMENT WITHOUT SHAPE DATA

- Look for edge lift or compression – flatten and steepen meridians independently as needed
- Ask the patient about lens awareness
- Look for lens movement with the blink – well aligned lenses do not move with the blink – this is a dead ringer for misalignment
- Manually center a decentered lens to check for alignment issues (checking especially for inferior edge lift)

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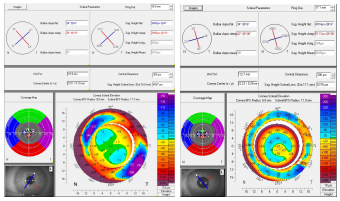
USING SHAPE DATA TO DRIVE DIAGNOSTIC FITTING

- Can obtain SAG data for any given diameter
- Can guide the need for spherical or toric or quad specific scleral zone



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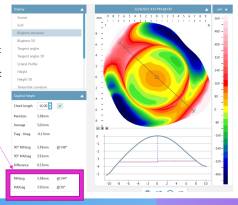
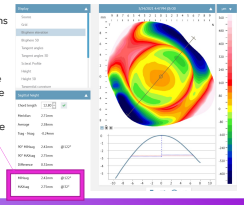
IF YOU HAVE OCULAR SURFACE SHAPE DATA – USE IT!

570 microns of toricity at 16 mm – don't just put it in the scleral zone!



330 microns of toricity inside the vault chamber – put it there and put the remaining 240 in the scleral zone



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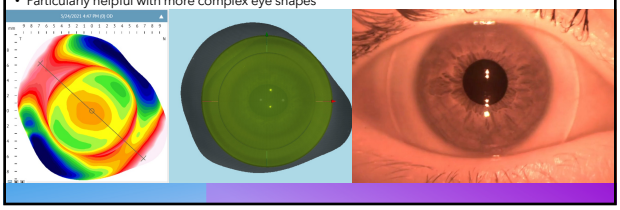
USING FITTING SOFTWARE TO EMPIRICALLY FIT

- Increasingly instrument based or cloud based software can empirically design lenses
  - Everything from determining the ideal DX lens to completely freeform lenses based of imaging
- Particularly helpful with more complex eye shapes



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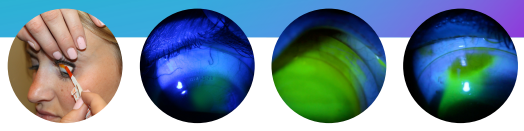
MANAGING FOGGING



- Add Fluorescein at follow up
- Watch for debris flow
- If obvious edge issues, adjust scleral zone (steeper / flatter)
- If not resolved, look at AMOUNT of edge that is actually sitting on the eye and consider if adding toricty to the vaulting chamber is needed to bring lens down closer to limbus
- If not resolved, consider QS or free form design to maximize the surface area between the lens and eye

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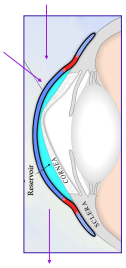
MANAGING DECENTRATION

- Gravity pulls the lens down
- The upper lid pushes the lens down
- The greater the vault, the more the lens decenters
- The more lens to eye surface area, the greater the **resistance** to decentration



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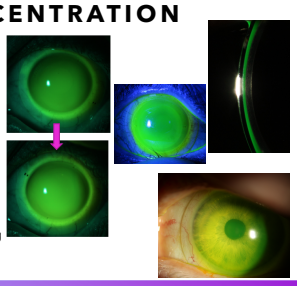
MINIMIZING DECENTRATION

- Keep vault as low as tolerable
- Check the edges in PRIMARY GAZE
- Maximize the lens / eye surface area
- Push the lens into a centered position and check to see if the edges are as aligned as they can be
- Do NOT overvault the limbus
  - Resist the urge to increase limbal clearance unless problems arise
- Ensure the lens lands as near to the landing point of the lens design 360 degrees



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