

Enhancing Initial SCL Fitting Success Utilizing Sagittal Depth

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Introduction

There are about 25% of patients dropping out in their first year of CL wear.¹ Soft contact lens (SCL) dropout is often associated with lens awareness, discomfort, or inadequate vision. The goal of this pilot study aimed to determine the appropriate CL sagittal depth (CL-SAG) by utilizing the ocular sagittal depth (OC-SAG) to improve practitioner first lens fitting success.

Methods

Inclusion Criteria

- 11.8 mm HVID
- No contact lens wear for 24 hours prior to evaluation

Initial Testing

- Ocular sagittal height evaluated using Zeiss Cirrus OCT with anterior chamber lens attachment
- Corneal topography and predicted sag estimated with Medmont Meridia
- A randomized fit of three subjects with spherical, -3.00 DS, 14.2 mm diameter custom SiHy (Definitive 74) material soft contact lenses of varying sagittal height achieved by steepening the base curve
- The lenses were evaluated on-eye after approximately 5 minutes of lens settling and subjects were asked about their subjective comfort. There was a 5 minute washout period between trial lenses
- Previous research shows that lenses should be fit approximately 200 microns deeper than the ocular sagittal depth²

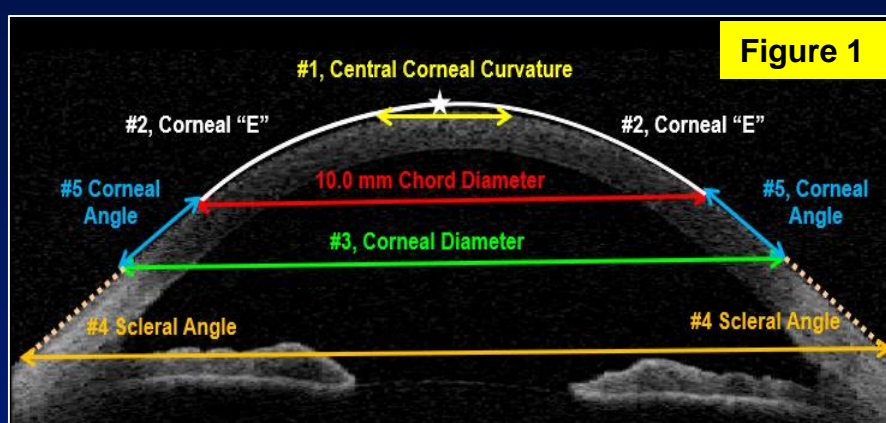
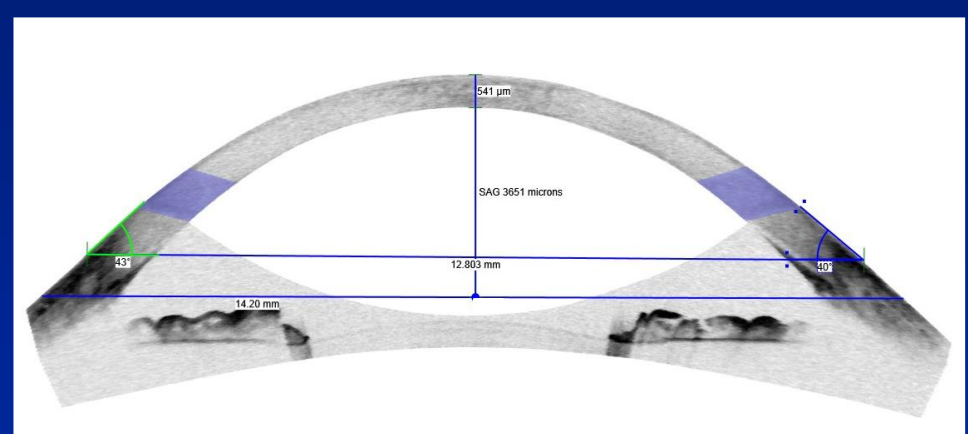


Figure 1: The main ocular anatomical features that may contribute to determining the OC-SAG or affecting the CL fit.

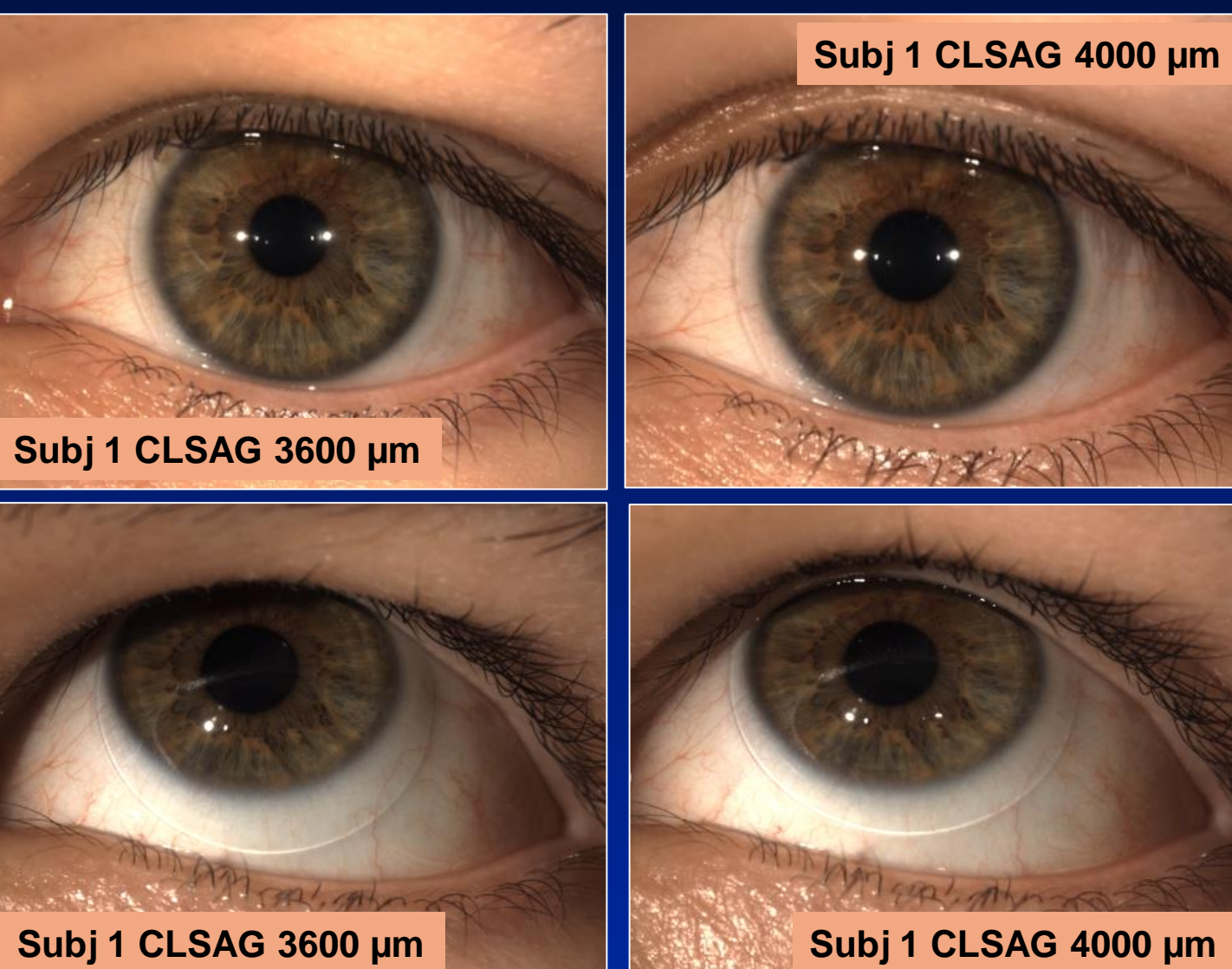
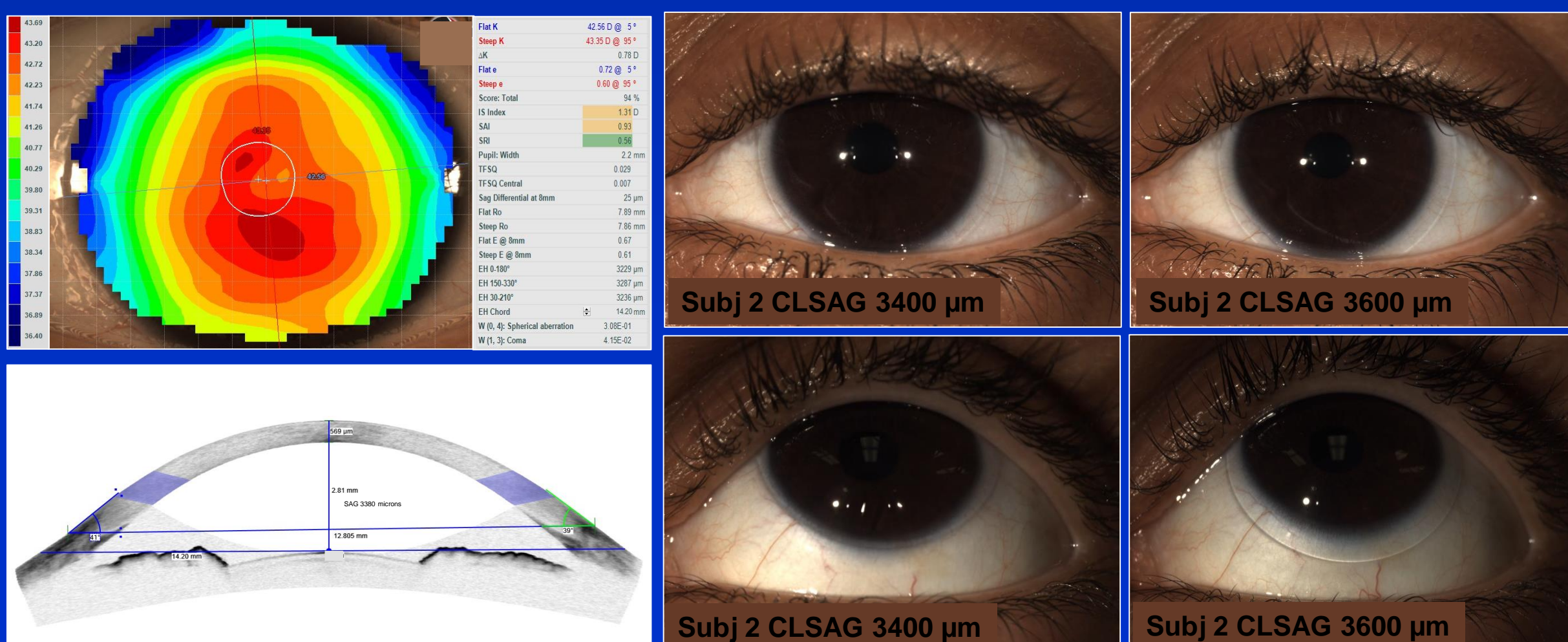
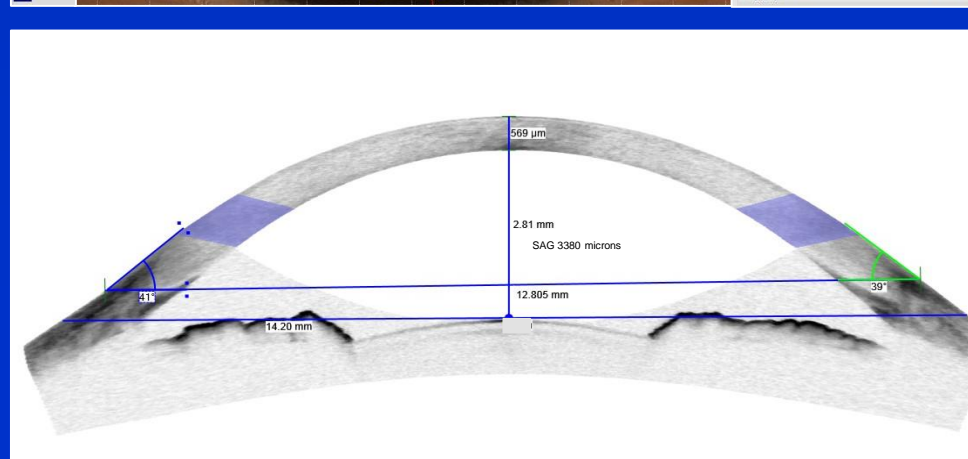
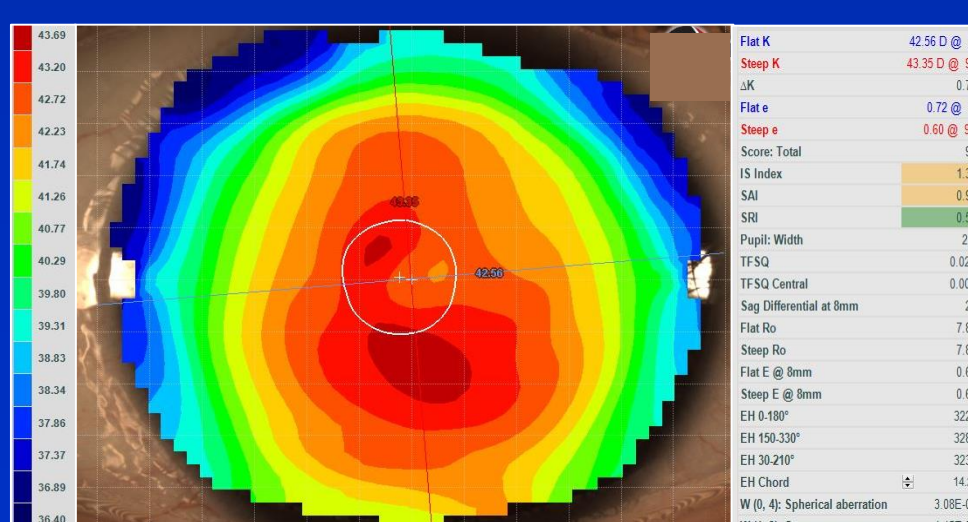
Lens Sagittal Depth	BC	Power	Diameter
3400	8.5	-3.00	14.2
3600	8.2	-3.00	14.2
3800	8.0	-3.00	14.2
4000	7.8	-3.00	14.2
4200	7.6	-3.00	14.2
4400	7.4	-3.00	14.2

Subject 1

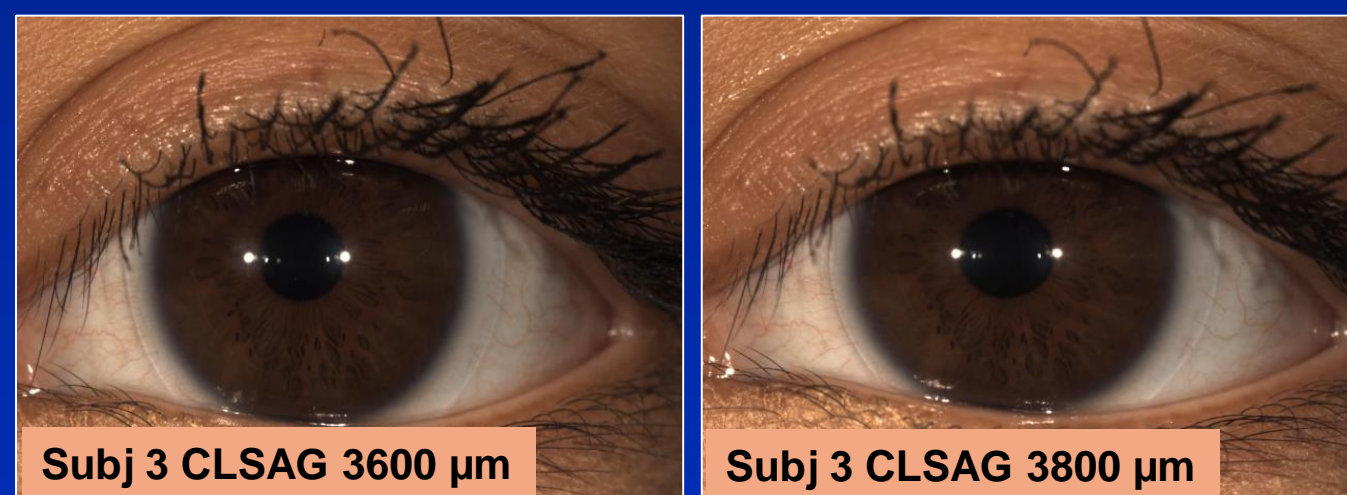
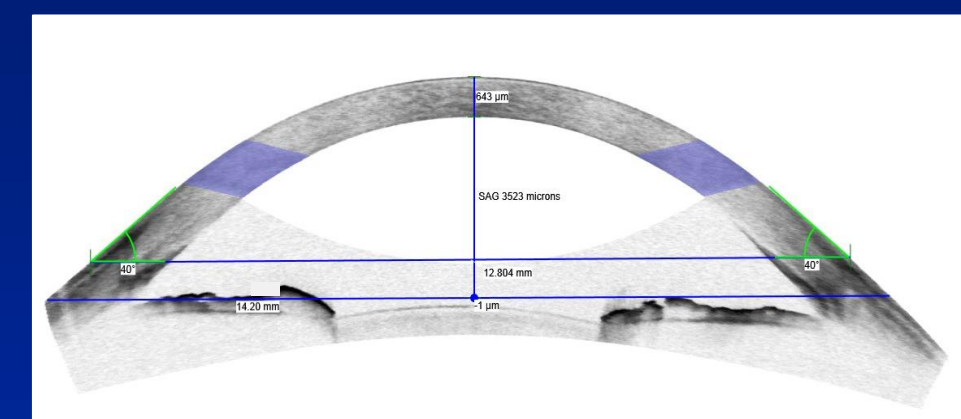
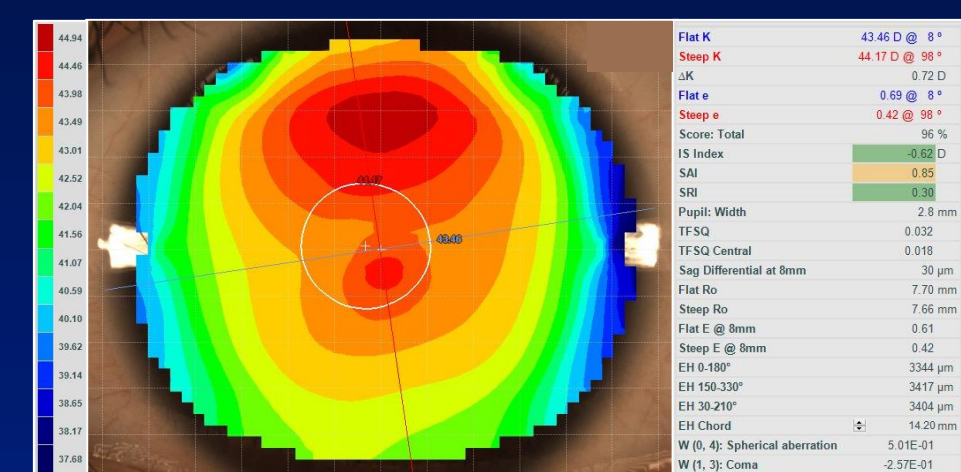


Subject 1 has a flat-K value of 43.25D with an average corneal angle of 41.5° is contributing to the 3651 micron OC-SAG at 14.2 mm. The nasal corneal angle is higher (43°), driving the lens temporally. The subject first appreciated comfortable lens wear with the 4000 sag lens, indicating a difference of **349 microns** between the CL-SAG and OC-SAG.

Subject 2



Subject 3 (Below)



Subject 3 (above) has a flat-K of 43.50D and a corneal angle of 40° is contributing to the 3523 micron OC-SAG at 14.2 mm. The subject first appreciated comfortable lens wear with the 3800 sag lens, indicating a difference of **277 microns** between the CL-SAG and OC-SAG. Upgaze views were similar between fits and showed adequate limbal drape.

Subject 2 (left) has a flat K value of 42.50D and a corneal angle of 40° is contributing to the 3380 micron OC-SAG at 14.2 mm. The subject first appreciated comfortable lens wear with the 3600 sag lens, indicating a difference of **220 microns** between the CL-SAG and OC-SAG.

Clinical Implications

For individuals with an average HVID of 11.8 mm it may be beneficial to select a SCL that is approximately **280 microns** (range 220 – 349 microns) deeper than the OC-SAG at the chord of the lens diameter.

Figure 2 shows data from 80 eyes measuring the ocular sagittal depth at chords ranging from 13.8 mm to 14.5 mm.

Figure 3 shows the spherical daily disposable sagittal depth charts³ with the red box indicating the range of lenses that would be 280±50 microns deeper than the average sag of 3482 microns at 14.2 mm (referenced in **Figure 2**).

Conclusion

This pilot study confirms that SCLs must be fit deeper than the measured ocular sagittal depth. The data from this study indicates that the SCL should be fit approximately 280 microns deeper than the OC-SAG. The CL-SAG fitting factor may vary depending on the SCL lens material and modulus, but provides an effective starting point for a new CL fit.

References

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- Michaud L, Tremblay C, Gregoire S, et al. Relationship between Ocular Sagittal Height and Soft Contact Lens Sagittal Depth to Improve Fitting and Comfort.
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