

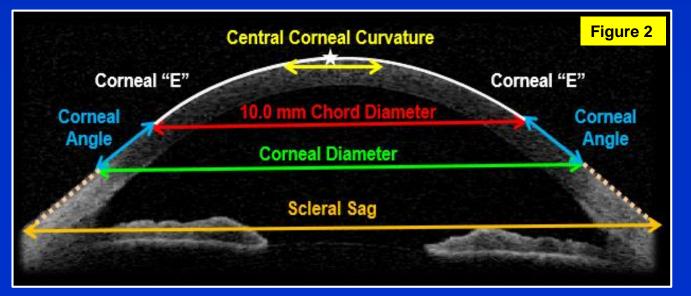
# Utilizing the Corneoscleral Profile and Sagittal Depth in Soft Contact Lens Fitting: A Case Series Mari Fujimoto OD FAAO, Patrick Caroline FAAO, Matthew Lampa OD FAAO, Randy Kojima FAAO, Beth Kinoshita OD FAAO, Mark Andre FAAO, Sissi He OD Pacific University College of Optometry, Forest Grove, Oregon

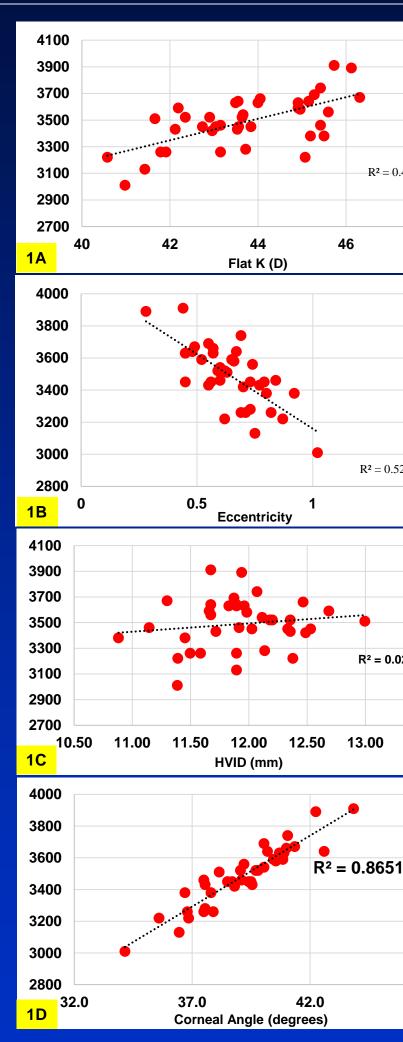
### Introduction

Research suggests a successful soft contact lens fit (SCL) is governed by the overall sagittal depth (SAG) of the lens in relationship to the underlying corneoscleral shape.<sup>1</sup> This case series seeks to explain the on-eye fit of SCLs utilizing the various ocular surface profile features and the association with both the ocular SAG (OC-SAG) and CL-SAG<sup>2</sup>.

### Evaluating the Ocular Surface **Profile and Ocular Sagittal Depth**

The major anatomical features of the ocular surface profile (Figures 1 and 2) that may contribute to the overall sagittal depth are the central corneal curvature (Ks), the corneal eccentricity (E), and the corneal angle which is a tangent line drawn from the corneal diameter chord (12.8 mm) to a 10 mm chord. Data analysis shows a weak correlation between the HVID and the ocular sagittal depth, indicating that the HVID minimally influences the overall ocular sagittal depth.





A 14.2 chord was used as this is the average lens diameter of a spherical SCL. (1A) The flat K values show a weak relationship in determining the OC-SAG. (18 There is a relative relationship between the corneal E and the OC-SAG. (1C) The HVID has minimal influence in determining the OC-SAG. (1D) The corneal angle at 12.8mm shows the strongest correlation in determining the overall OC-SAG.

## Case 1 (Right)

KS has a 12.3 mm HVID with a steeper nasal corneal angle

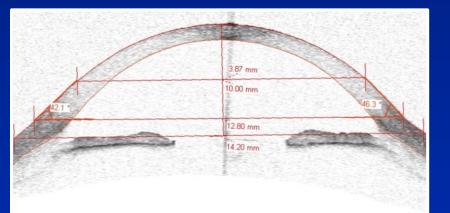
compared to the temporal corneal angle in the 180 meridian. In a shallow SCL (3A), there is inadequate limbal coverage and significant temporal decentration

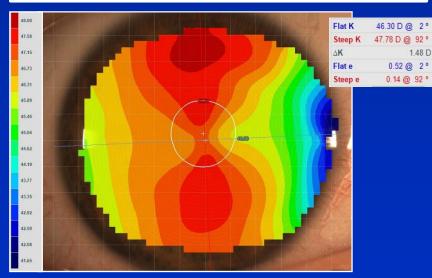








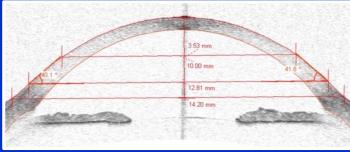




JA has an 11.3 mm HVID with steep Ks and a low corneal E. The shallow sag of SCLs A and **B** compared to the ocular surface profile resulted in lens fluting. Image C shows a lens of adequate sagittal depth providing an appropriate fit.







and comfortable fit with a custom SCL (BC 8.3 / 15.0 DIA).

### of the SCL on eye. As the SCL SAG increases (3B, 3C), the lens centration improves and provides a dispensable fit (30

(6B) CLSAG 3912 um



HA has a 12.3 mm HVID with slightly steeper than average K's, and a relatively high corneal angle. HA has difficulty with SCL comfort with even the greatest SAG SCL at the time of HA's visit. 4A shows inadequate SCL-SAG. **4B and C** are the same lens revealing adequate limbal coverage in primary, but excessive movement in cornea in upgaze. HA's OC-SAG exceeded the SCL SAGs available. 4D exhibits a successful

## **Clinical Implications**

Utilizing our understanding of the ocular surface, we can use the sagittal depth charts to guide clinical decision-making based on our SCL fit observations.

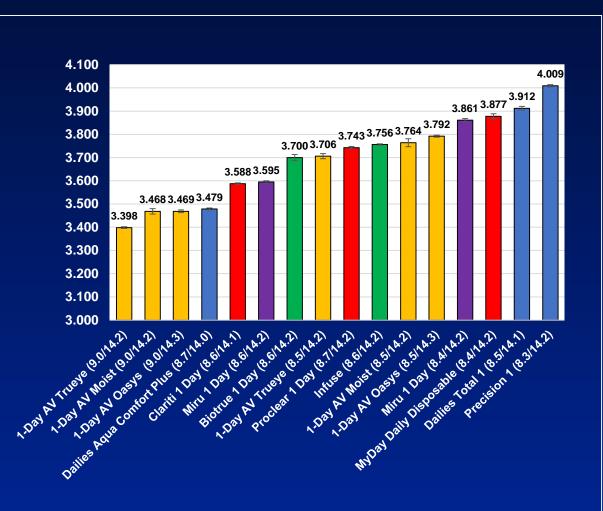
## Conclusior

The case examples demonstrate the impact of the corneoscleral profile on the on-eye fit of a SCL and how to effectively utilize the CL-SAG charts to guide lens selection. The data analysis evaluating the relationship between the ocular surface profile and the OC-SAG helps to explain some of the SCL fitting anomalies observed in patients with seemingly normal corneas.

1. Young, Graeme\*; Hall, Lee†; Sulley, Anna‡; Osborn-Lorenz, Kathrine§; Wolffsohn, James S. I Interrelationship of Soft Contact Lens Diameter, Base Curve Radius, and Fit, Optometry and Vision Science: April 2017 - Volume 94 - Issue 4 - p 458-465 2. Van der Worp E, Lampa M, Kinoshita B, et al. Variation in sag values in daily disposable, reusable and toric soft contact lenses. Contact Lens and Anterior Eye. 2021 Online ahead of print.



1) With significant temporal lens decentration, selecting a lens of a greater sagittal depth may improve lens centration.



2) If the patient has steep Ks, a low corneal eccentricity, and a high corneal angle, the patient will likely require a lens fit from the right hand side of the chart (Figure 7) to provide an adequate lens fit. 3) If the patient exceeds the deepest CL-SAG available on the market, they will likely be best served with a custom SCL.