

What Scleral Lens Diameter Will Accommodate Most Eyes?

Randy Kojima, Patrick Caroline, Beth Kinoshita OD, Matthew Lampa OD, Mark Andre, Mari Fujimoto OD
Pacific University College of Optometry, Forest Grove, Oregon

Introduction

Scleral lenses have a wide range of applications from correcting simple refractive errors, through managing disease and post surgical complications. Given the wide range of eye shapes, sizes and conditions these lenses must manage, industry has been up to the task of providing a broad parameter range. Corneal-scleral lenses are available as small as 13mm and full vaulting scleral lenses can be ordered as large as 25mm.¹ With such a wide diameter range to choose from, is there an optimal size that would manage most conditions or patient types? And how often would we need to deviate from this typically employed lens diameter?

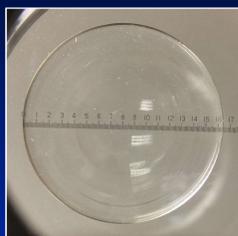
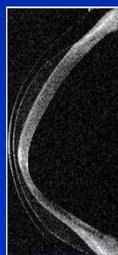


Figure 1: Scleral lenses are available in diameters from 13.0 – 25mm.

Figure 2: The scleral lens diameter must be appropriate for the corneal diameter and irregularity being managed



Methods

Retrospective data was collected over a one year period, between April 1, 2018 and March 30, 2019. This included every Ampleye scleral lens manufactured and delivered by Art Optical (Grand Rapids, MI) during the sample period. The volume of lenses supplied is proprietary however, considering the size of Art Optical and its domestic and international reach in distribution, the number of patients and eyes can be considered substantial and measured in the tens of thousands. The Ampleye is available in custom lens diameters from 15.0 to 17.0mm in 0.5mm increments. The standard diagnostic set includes 16.5mm diameter lenses while the expanded set adds 15.0 and 15.5mm trials. Every lens order was recorded during the sample period including the diameter selected.

Results

The five diameter options are displayed in Table 1 with the X-axis displaying lens order diameters from 15.0 – 17.0mm. The Y-axis defines the percentage of orders placed in each diameter category. The most commonly employed diameter was the 16.5mm making up 74.8% of the total orders. There is a significant step down to the second most commonly employed diameter which was the 15.5mm representing 13.5% of orders. In the middle of both size and percentage was the 16.0mm with 7.5%. The smallest 15.0mm diameter option was used in 3.3% of cases while the largest 17mm diameter was prescribed only 0.9% of the time. When combining the 16.0 – 16.5mm usage, these diameters are used 82.3% of the time. If the diameter range from 15.5 – 16.5mm is included, this represents 95.8% of orders.

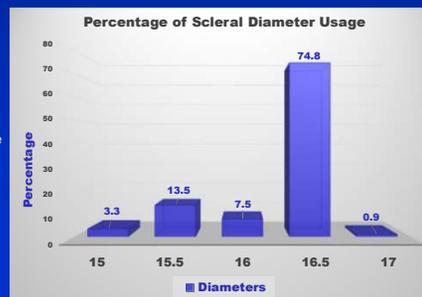


Table 1: This graph displays the percentage each lens diameter was prescribed over the study period.

Discussion

It seems logical that the results would show an obvious bias towards the diameter(s) of the diagnostic set. A drawback of this study is that the findings are specific to one design only and the specific range of diameters provided by this particular brand. However, given the volume of orders represented in this data, it provides a window into what size of lens is well tolerated by a broad cross section of patients. It also provides us with an understanding of how often we need to alter lens diameter due to visible iris diameter size, severity of condition, application and removal challenges, anterior surface obstructions such as pingueculas and filtering blebs. This poster has not defined what diameter should be employed for specific patients or conditions. Nor has it determined how wide a diameter range or its increments should be. However, it does appear that a broad cross section of the scleral population can be fit with diameters between 15.5 and 16.5mm in size.

Conclusion

From this analysis, we can conclude a high percentage of our patients can fit into a median scleral diameter of 16.5mm. But it seems clear there are times when diameter needs to be increased or decreased with a strong bias skewed toward smaller rather than larger scleral lenses. Additional research should be performed to determine if an optimal diameter exists and what circumstances or specific conditions would dictate when to deviate from the standard size.

References

Barnett M, Johns L. Ophthalmology Current and Future Developments (Volume 4) Contemporary Scleral Lenses Theory and Application, Bentham eBooks (online), 2017

Acknowledgements

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