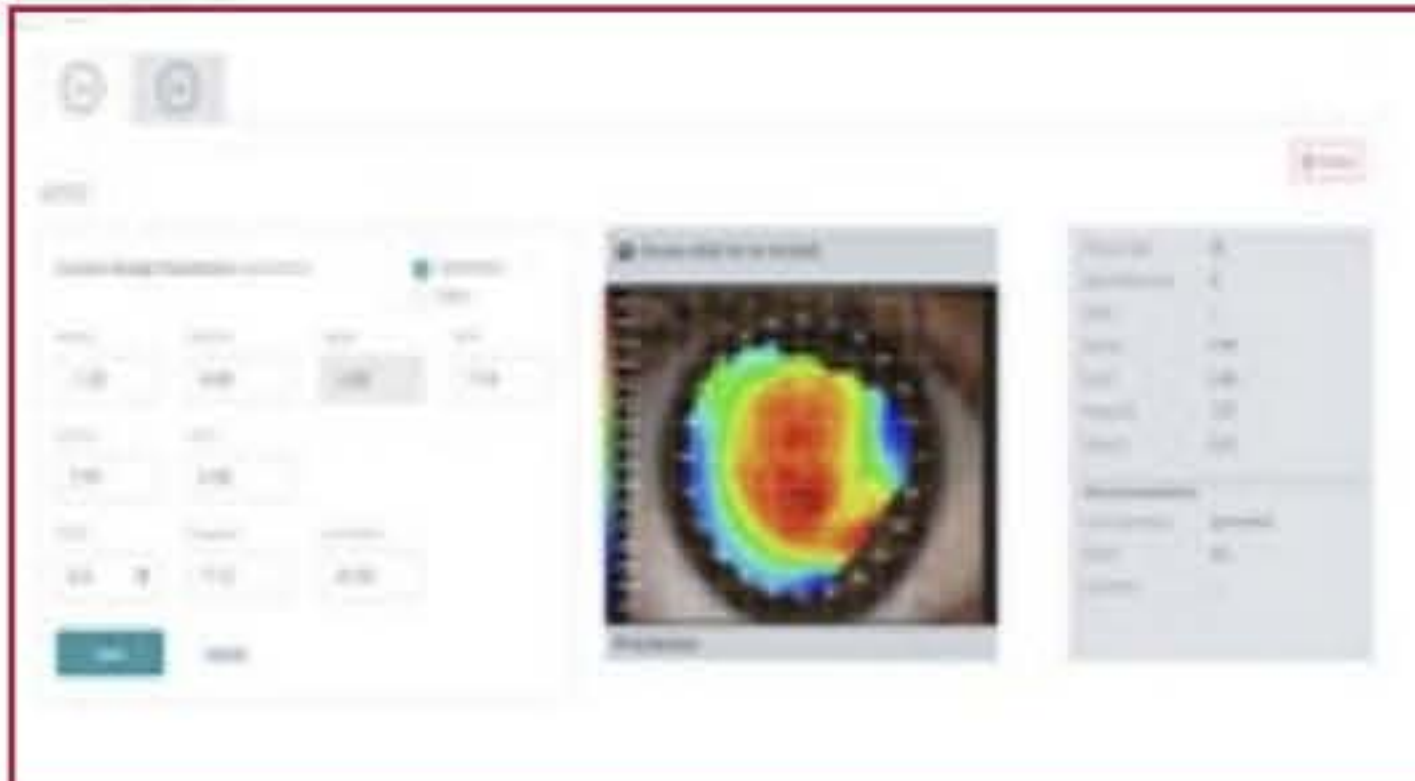


Utilizing a Cloud-Based Software Program to Enhance First Lens Fit Success for Ortho-K Lenses

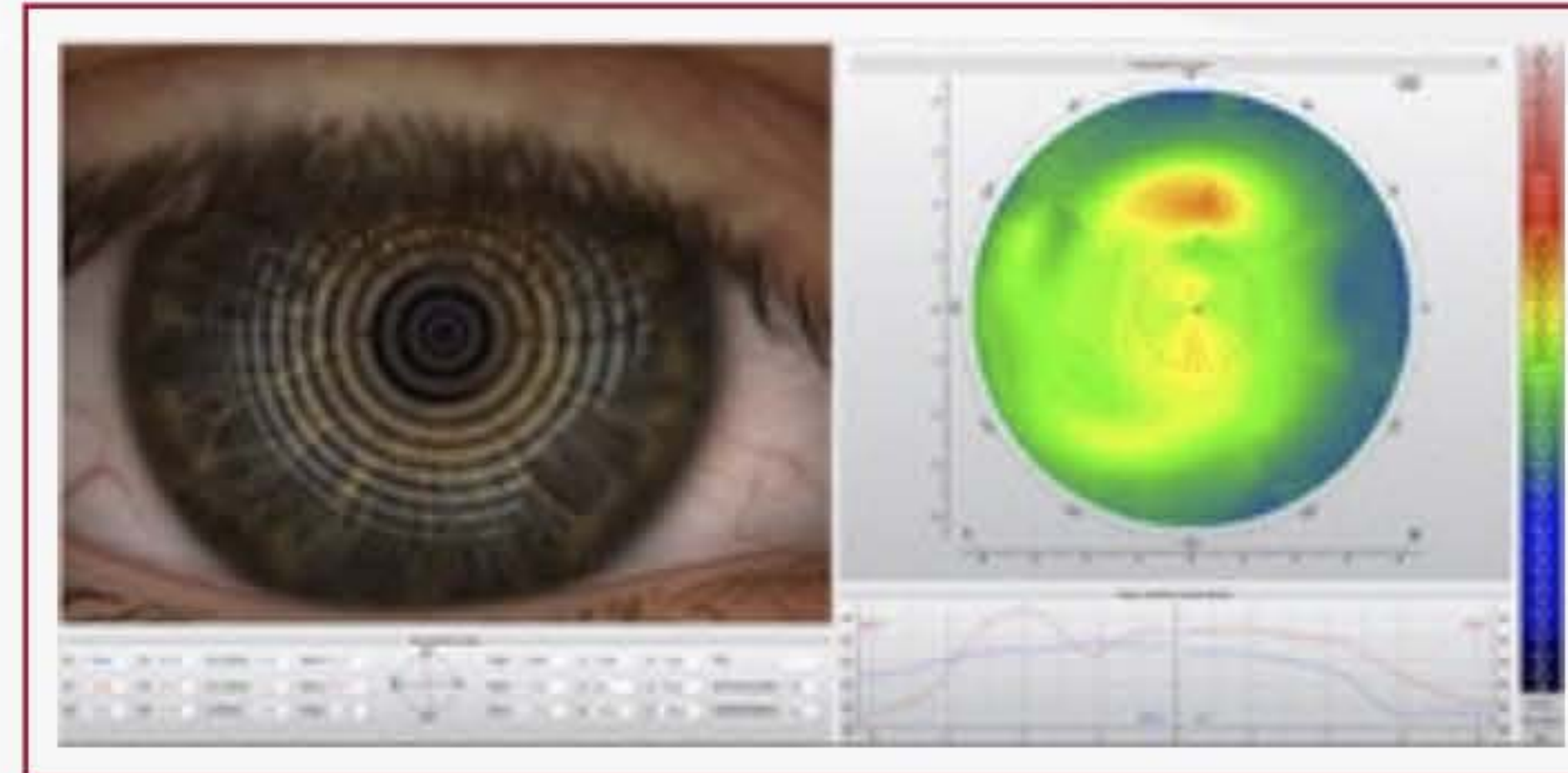
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PURPOSE

Orthokeratology is the process of reshaping the cornea with rigid gas permeable lenses to correct refractive error. This method of correction dates back to the 1960's. With FDA approval of overnight, orthokeratology surged nearly two decades ago changing the utilization significantly. Since then, improvements in lens design and diagnostic technology have allowed for a streamlined, highly successful process for fitting. The SMART study recorded an 80.5% first lens success rate with a 95.5% success rate after 1 lens change. As orthokeratology has become more commonly used in myopia management of children, the ability to customize the treatment with smaller optic zones and toric alignment has been increasingly important. The ARISE Orthokeratology System is a cloud-based software that directly designs lenses based on corneal topography and allows for optimization and easy modification when needed. Using corneal topography data, success should be higher with first lens fits than with systems that only use central keratometry readings. The purpose of this study was to determine the success rate of the ARISE Orthokeratology System for orthokeratology.



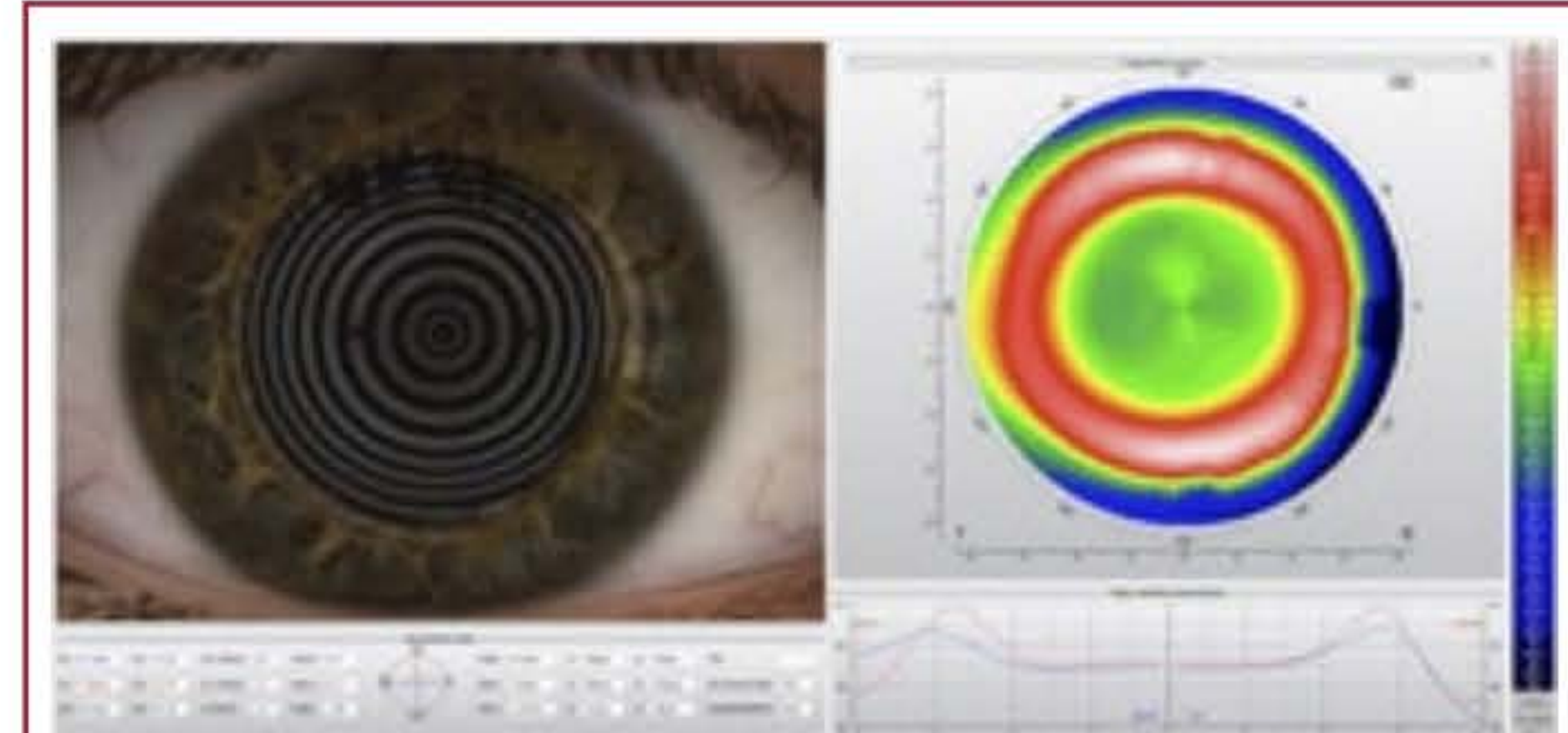
	Manifest Rx Sphere	Successful	# of lenses needed
Patient 1	OD: -3.25 DS	yes	OD: 1
Patient 2	OU: -1.50 DS	yes	OD: 1 OS: 1
Patient 3	OD: -0.75 DS OS: -1.25 DS	yes	OD: 1 OS: 1
Patient 4	OD: -3.50 DS OS: -3.00	yes	OD: 1 OS: 1
Patient 5	OD: -1.75 DS OS: -2.00	yes	OD: 1 OS: 1
Patient 6	OD: -2.75 DS OS: -3.00 DS	yes	OD: 1 OS: 1
Patient 7	OD: -1.25 DS OS: -0.75 DS	yes	OD: 1 OS: 1
Patient 8	OD: -3.75 DS OS: -3.75 DS	yes	OD: 1 OS: 1
Patient 9	OD: -2.25 DS	yes	OD: 1
Patient 10	OD: -4.25 DS OS: -4.25 DS	yes	OD: 1 OS: 1
Patient 11	OD: -5.00 DS OS: -5.00 DS	no	DC due to poor fit
Patient 12	OD: -1.25 OS: -1.75	yes	OD: 1 OS: 1
Patient 13	OD: -3.75 DS OS: -4.50 DS	yes	OD: 1 OD: 1
Patient 14	OD: -1.00 DS OS: -1.00 DS	yes	OD: 2 OS: 2
Patient 15	OD: -5.75 OS: -6.00	yes	OD: 2 OS: 2



Top: Pretreatment topography measurement of -3.00-0.50x180 myope.

Middle: Ortho-k lens on eye showing fluorescein ring with good centration.

Bottom: Post-treatment topography measurement showing central flattening with circumferential steepening.



METHODS

15 Patients were fit in ortho-k lenses using the ARISE Orthokeratology System. This software utilizes corneal topography and spectacle prescription to determine an ideal lens fit. Corneal measurements were obtained using an Oculus Keratograph 5M and data uploaded to the cloud-based software. Manifest Refraction Sphere power was entered, and lenses were ordered and dispensed. Patients returned for follow-up examination where topography and uncorrected visual acuities were assessed. If follow-up topography yielded sub-optimal results, the lens design was adjusted to improve fit.

Results

Of the 15 patients fitted, one discontinued wear due to lens breakage and was refitted in a different design. Of the other 27 eyes fitted with the ARISE lenses the average entering pre-treatment refractive error was -3.00 D. The average post-treatment VA was 20/20^{-1.5}. A mean of 1.13 lenses were required to achieve a successful outcome. The success rate for first lens fit was 85.17%, compared to 80.5% in the SMART study, and after one lens change it was 100%.

CONCLUSIONS

The ARISE Orthokeratology System is an easy to use and effective means of prescribing ortho-k lenses. Practitioners can have a high success rate without investing in fitting sets or instrument-based software applications.