
New Technologies in Anterior Segment Diagnostic Assessment for Refractive Lens Exchange

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With over 110 million Americans now older than 45 years of age and more than 91% of them using cell phones and computers on a daily basis, solutions for presbyopia have become the most demanding challenge for refractive surgeons today.¹ The term *refractive cataract surgery* has been in use for a decade. To date however, lens-based procedures have been unable to achieve the same high rates of uncorrected visual performance seen with excimer corneal treatments. Anterior segment analysis is an important process when planning refractive lens exchange (RLE) procedures and includes a variety of methods to assess corneal shape and optical clarity. Multiple new technologies have been developed to improve patient screening and to further enhance corneal analysis.

CORNEAL TOPOGRAPHY

Corneal shape analysis is a critical and increasingly more complex process during the preoperative planning and postoperative analysis phases of RLE surgery. Corneal

shape parameters are obtained in order to provide multiple anatomical data points for use in intraocular lens (IOL) calculations and corneal incision placement. Addressing corneal astigmatism has been recognized as a key element in providing high visual performance following IOL implantation, which necessitates attention to preoperative corneal shape analysis.²

Modern topographers strive to correctly measure corneal astigmatism, which surgeons can address to meet patient expectations and improve intraocular surgery outcomes. Advanced Placido disc technology and combination with other technologies, such as wavefront and digital imaging, aids the surgeon in patient selection and treatment decision making (Figure 5-1).

Systems commonly provide indices to assist clinical diagnosis and the selection of surgical techniques. Examples include corneal surface asymmetry, keratoconus indices, elevation map height asymmetry, and apex decentration. Values are presented as color codes, and abnormal values are highlighted to alert the clinician of outliers. Real image capture overlays, pupillary information, and white-to-white