

# A Corneal Analyzer for Advanced Surgical Planning

The Nidek/MARCO OPD-Scan III provides all the clinical information necessary to achieve targeted surgical outcomes.

By Cynthia Matossian, MD

Patients' expectations about their cataract surgery results are very high, whether they select a monofocal or a premium implant. The one-type-fits-all approach to IOL selection is fortunately becoming a thing of the past. To personalize the lens for each eye of every patient (at times, bilateral eyes require different implant types), I need the appropriate tools to gather the necessary information in a manner that is easy and efficient for my technicians and our patients.

The OPD-Scan III Refractive Power/Corneal Analyzer (marketed in the United States by Marco) fulfills this clinical need by obtaining a vast amount of patient data in a matter of seconds. This single device provides autorefractive, pupillometry, keratometry, corneal topography, and wavefront aberrometry within 10 seconds of measuring the eye. The speed and accuracy by which the data are captured gives me the confidence to use the information for implant selection.

## CUSTOMIZED IOL SELECTION

The data maps on the OPD-Scan III are designed to help ophthalmologists evaluate patient information in order to create a surgical plan with the goal of achieving optimal visual outcomes. In our clinic, my staff and I integrate the data from the OPD-Scan III maps with our electronic medical records system. This allows us to display these maps on large-screen monitors in each examination room, enabling our physicians to show patients their test results in real time and explain the color-coded maps in an easy-to-understand manner for patients.

## MY DECISION TREE AFTER MYOPIC LASIK

An increasing number of former LASIK patients, now older, are requesting better vision. They have bothersome cataracts and decreased functional vision, particularly for nighttime driving. I have to set proper expectations for these patients, who have a higher chance of refractive unpredictability after cataract surgery. For eyes that have undergone prior myopic LASIK, I input the average pupil power (APP) from the axial map of

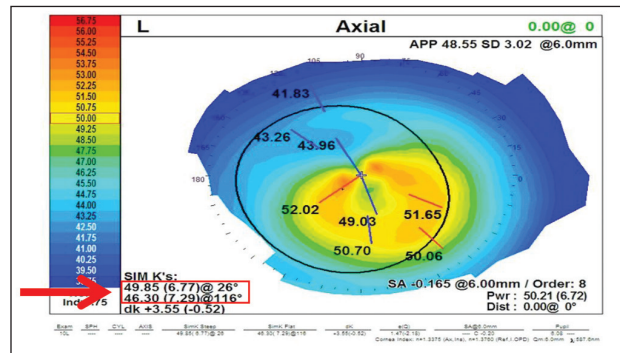


Figure 1. An OPD-Scan III axis map of a patient's cornea pre-operatively after removing a rigid gas permeable contact lens.

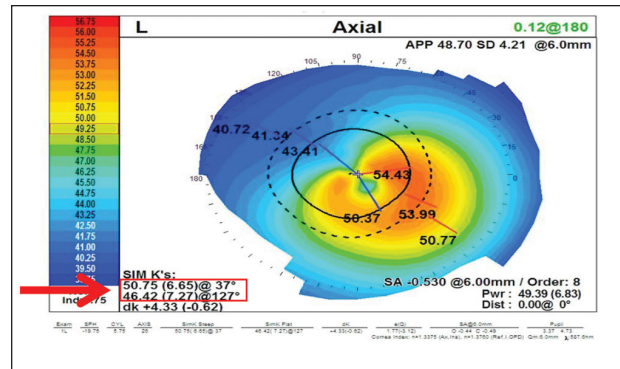


Figure 2. The same eye showed a change in cylinder after the rigid gas permeable lens had been out for 2 months.

the OPD-Scan III into the online IOL calculator of the American Society of Cataract & Refractive Surgery. Adding this variable improves the accuracy of the IOL power calculation.

## A SURGICAL ASSESSMENT AND PATIENT INFORMATION TOOL

I use various maps from the OPD-Scan III to evaluate the health of the corneal surface and tear film prior to cataract surgery (Figures 1 and 2). I find it helpful to show patients these images so they understand the impact that the health of their ocular surface may have

on their results. An image that shows irregular, warped, or missing mires is an easy way to demonstrate to patients the effects of dry eye disease. Also, by explaining that they have a pre-existing condition, patients are less likely to associate their progressive ocular surface disease with the cataract surgery. Depending on the severity of their ocular surface disease, I may delay the surgery and institute a personalized treatment regimen that includes Restasis (Allergan), oral supplements of omega-3 fatty acids, and/or Lotemax gel drops (Bausch + Lomb) to optimize the surface. I then bring the patients back to remeasure their eyes with the OPD III after an appropriate amount of time.

### ASTIGMATISM ANALYSIS

The axial map from the OPD-Scan III demonstrates both the amount and the pattern of anterior corneal astigmatism. Accordingly, I can show the patient his or her astigmatism and, in the event of a “bow tie” symmetrical pattern, help him or her understand the benefits of a toric implant. Thanks to this visual aid, my conversion rate to toric implants is high.

If, on the other hand, the patient has corneal ectasia with a large offset cone either inferiorly or superiorly, then I can show him or her the abnormality and set a realistic expectation for the postoperative outcome and continued need for spectacles.

### MULTIFOCAL IOL DECISION TREE

In my opinion, a positive angle kappa greater than 0.43 mm is contraindicated for an AcrySof ReSTOR multifocal IOL (Alcon), and an angle kappa of greater than 0.50 mm is contraindicated for a Tecnis Multifocal IOL

(Abbott Medical Optics). I believe there may be increased halos and light phenomena while night driving if the patient’s visual center is significantly misaligned with the anatomic pupillary center on the mesopic map.

### ASSESSING PHOTOPIC AND MESOPIC PUPILS

Under certain conditions, pupillary size may need to be factored into the decision regarding type of implant. The OPD-Scan III gives me both the photopic and mesopic pupil size in two different, easily identifiable colors on the mesopic map.

### ASPHERIC DECISION TREE

Patients who select monofocal IOLs or those who are not candidates for premium implants still deserve the best potential visual outcome postoperatively. Matching their corneal spherical aberrations as closely as possible with aspheric IOL optics may potentially improve their visual acuity and enhance their contrast sensitivity. I rely on the OPD-Scan III to calculate every implant. Without this information, I would not be able to customize the data for every eye to consistently achieve my surgical targets. ■

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## HIGH UTILITY OF THE OPD-SCAN III FOR CATARACT PATIENTS

### By Ilya Rozenbaum, MD

I, too, find the data from the OPD-Scan III very useful for planning cataract surgery. I look at several of the system’s maps to collect data about the status of an eye. First, I determine the amount of irregularity in the visual system and whether it is coming from the cornea, the rest of the optical system, or both. Next, I look at the corneal topography to see how much corneal astigmatism is present and whether it is regular or irregular. I compare the autokeratometric measurements against manual Ks and IOLMaster K readings (Carl Zeiss Meditec).

The corneal spherical aberration measurement is especially useful in selecting the best possible aspheric IOL for correction. For example, most eyes need between +0.25 and +0.30 D of cylinder correction, and for those I select a Tecnis IOL. However, I also look at the pupillometry data to help predict an IOL’s centration relative to

the center of the pupil and visual axis. This is especially important for multifocal IOLs. If angle kappa is too high, I am less likely to recommend a multifocal IOL. Finally, the retroillumination image is helpful in patient education and documenting lens opacities.

For the growing number of patients who have undergone prior laser refractive surgery, the OPD-Scan III calculates the effective central corneal power. This provides a K reading that can be used to calculate the IOL power when preoperative refractive measurements are not available. ■

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