Patients ask for perfection. Get as close as possible by approaching cutting-edge surgery with the OPD III.

When patients undergo cataract surgery and pay out of pocket for premium IOLs, they’re expecting perfection, so we better get it right the first time. We can’t promise perfection, but we’re getting closer, thanks to new lenses and new diagnostic technologies such as the OPD Scan III (Marco).

The Right Diagnostic Technology

Outdated diagnostic equipment doesn’t provide us with the complete picture, so it sometimes prevents surgeons from getting the IOL and positioning right. New diagnostic technologies help ensure that we get it right the first time, choosing and positioning IOLs for the best outcomes, plus new technology makes it easier to up-sell premium lenses because patients can see the differences in their vision correction options.

I use the OPD III for all of my cataract patients. It’s a blue-light corneal topographer and autorefractor that also includes a wavefront refractor, wavefront analyzer, internal optical path difference analyzer (OPD) and light/dark pupillometer. The OPD allows me not only to get corneal topography, but also to see corneal spherical aberrations so I can match the best aspheric lens for maximum contrast sensitivity. Its 11,880 data points and 33 placido disc rings provide a dense matrix of data, making IOL calculations more accurate and enabling me to evaluate the effects of previous refractive surgery on the central cornea.

By adding wavefront patterns and IOL-matching to the cataract evaluation, the OPD III manages to avoid adding time and square footage. The scan takes 10 seconds without moving patients around between four different machines, desiccating the ocular surface along the way. We acquire the data simultaneously from a fresh eye.

Most importantly, data provided by the OPD III translate into better results because it’s easier to achieve the outcomes we want when we know what we’re aiming for. As surgeons, we’re concerned that we can only hit within a quarter diopter of our target with cataract surgery. That quarter diopter is all the more reason to remove every potential source of error from the system. If we reduce astigmatism and spherical aberration and improve lens positioning through diagnostics, then we “limit the limitation” to that quarter diopter.

Toric Lens Advantages

Any surgeon using toric IOLs should be using corneal topography. The IOL Master (Carl Zeiss Meditec) and LENSTAR (Haag-Streit) have built-in keratometers whose purpose is to obtain average K readings for lens formulas, but they don’t include topography and thus can’t tell you if astigmatism is symmetrical. Even if IOL calculations show that a patient has a high degree of cylinder, topography may reveal asymmetric astigmatism that makes torics the wrong choice. Without topography, we may implant toric lenses in these patients, and they’ll be very unhappy with the results.

The OPD III provides a Toric IOL Summary that merges the corneal topography with infrared photography. This summary includes a built-in, easy-to-use toric axis marker. Rather than marking with a pen in the optical area, which gives you a mark with an ink spread of about 5 degrees and doesn’t account for cyclorotation, you can mark very accurately with preoperative diagnostic imaging.

To mark the location where keratometry calculations show the lens should be, I look at illuminated physical landmarks like scleral vessels and iris crypts or nevi, with the astigmatism imaging and IOL placement superimposed. During surgery, I line up my IOL accord-
ing to physical landmarks, rather than ink marks. This is a much more accurate system, and it allows me to check accuracy and rotation after surgery.

**Multifocals and Angle Kappa**

In my practice, we’re seeing a large number of multifocal cataract patients. Every now and then, we would get surprises where refraction and topography said the patient should get a multifocal IOL, but after surgery, the patient didn’t see well. This is due to large angle kappa. Patients with large angle kappa are looking through the IOL’s rings off to the side, rather than straight through the center.

The OPD III picks up the angle kappa before surgery. Because each IOL has a certain range in which a patient can be off axis and still reach their vision goals, we may still be able to implant a multifocal lens, or we may need to use a different approach.

The OPD III can refract patients with mesopic pupil and a photopic pupils, giving us an advantage in terms of evaluating day and night vision and predicting the effects that any IOL, but particularly multifocal lenses, will have on night vision. I can adjust the prescription to reduce problems with night driving. I can even identify those patients who might have trouble driving with multifocal lenses during the day because their pupils are a bit larger than expected in daylight conditions.

The fact that the OPD III’s wavefront analysis allows us to choose an IOL based in part on how it corrects spherical aberration is another major advantage for multifocal patients. Multifocal and post-refractive patients have extremely high standards, so any reduction in spherical aberration — and enhancement to contrast sensitivity — will improve their satisfaction with the outcome.

**Previous Refractive Surgery**

When patients have had previous refractive surgery, we must be mindful of the risk of adding additional aberrations and distortions into the eye. Some patients may have better results from monovision or toric rather than newer lens technologies such as multifocal lenses.

Though cataract patients may tell us they’ve had laser surgery, they often don’t have documentation or don’t know the details of the procedure and outcome. They usually don’t even know if the refraction was myopic or hyperopic. Since they can’t answer these questions, we need a diagnostic technology that can provide the missing information, especially as we look to a future that is bound to include more and more post-refractive surgery patients.

The OPD III shows me the patient’s total optical system. Topography answers basic questions about the previous surgery. Effective lens position is another concern. The OPD III acquires wavefront data in a 9.5-mm area, which includes LASIK treatment edges and blend zones. By comparing the periphery to the central corneal powers from the topography, the system determines the central corneal curvature power before refractive surgery and arrives at an effective central corneal power (ECCP). We use the ECCP to get our K value for IOL calculation. I go into surgery knowing that even without thorough documentation of the previous refractive surgery, my treatment is on target and I can expect my patient to be happy with the outcome.

**Outcomes and Satisfaction**

With patient expectations so high, we have to deliver the best possible vision. The OPD III and the latest IOLs make that an attainable goal. What’s more, the OPD III helps us bring patients into the loop. We can show them the difference that premium IOLs might make over other lenses. Patients can compare the difference after surgery as well. They’re making a major investment in their vision, and the OPD III can show them that the expense was worth it.

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