

Refractive Diagnostics that Redefine the Practice Value Proposition:

- **MORE INTEGRATED DATA IN LESS TIME**
- **TOOLS AND TIME FOR EDUCATION**
- **ENHANCED PATIENT IMPACT AND OUTCOMES**

INSIDE:

Accurate Data Drives Excellent Results

Richard Tipperman, MD
Philadelphia, Pa.

Enhancing Cataract Surgery Outcomes

Edward Hedaya, MD
Lakewood, NJ

The Puzzle Solver

Timothy Page, MD
Birmingham, Mich.

Customize Your Data

Joseph Gold, MD
Great Barrington, Mass.

Better Information, Better Outcomes

Jeffrey D. Horn, MD
Nashville, Tenn.

Achieve Results and Manage Expectations

David J. Ludwick, MD
Chambersburg & Waynesboro, Pa. and Hagerstown, Md.

The OPD-Scan III: Great Things in a Small Package

Binoy R. Jani, MD
Fredericksburg, Va.

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Accurate & Critical Data Drive Excellent Results

HOW A CATARACT AND REFRACTIVE SURGERY SPECIALIST PUTS THE OPD-SCAN III TO WORK

Did you hear about the cataract surgeon with mediocre outcomes?

Not many people have — and that's kind of the point. Providing excellent visual outcomes to patients is the best way to build a practice. Top-quality outcomes start with accurate data. The better the information the surgeon has to thoroughly assess a patient's visual needs and plan surgery, the better job he can do for that patient in the operating room.

Richard Tipperman, MD, a cataract and refractive surgery specialist with Ophthalmic Partners in the Philadelphia area, starts his surgery planning with accurate exam data from Marco's OPD-Scan III. The highly automated OPD makes it easy to collect precise autorefractometry, corneal topography, wavefront aberrometry, keratometry, and pupillometry data, which is then automatically transferred to the practice's NextGen EMR system.

"By the time I see patients before cataract surgery, they've had their axial length measurement done and an OPD exam," Dr. Tipperman says. "You need the axial length measurement to select the strength of the implant. The axial length measurement also will tell you if someone has an extreme level of myopia or hyperopia, but it doesn't really tell you much else. The OPD tells you a tremendous amount about the patient's tear film and provides corneal topography data, using Placido disc topography, to measure the regularity of the cornea."

Ophthalmic Partners, a 12-ophthalmologist multispecialty group based in Bala Cynwyd, operates four practices and an ambulatory surgery center in Philadelphia in its suburbs. The

group includes partners who specialize in glaucoma, pediatric ophthalmology, corneas, and external disease in addition to its cataract and refractive surgeons.

Advanced Technology IOLs

"We use the OPD as part of our screening evaluation and it is really helpful to us," Dr. Tipperman says. "I call it the Swiss Army Knife of diagnostic tools. In one short click, my techs collect most of the information I need to make a determination about what options we can offer and what lens technology might be best for a particular patient."

Dr. Tipperman says approximately half of his cataract surgery patients ultimately receive some type of advanced technology procedure. He believes the capability to show patients their topography maps and astigmatism is a powerful tool that helps them understand why a toric IOL is the right choice for them and makes them more confident in that choice.

Similarly, for a patient who is a potential candidate for a multifocal IOL, the OPD-Scan III's accurate pupil size measurements in low light and bright lighting identify patients whose pupils may be too large to be good candidates for a multifocal IOL. The data on high-order aberrations and the patient's angle kappa also help identify good candidates for a multifocal IOL. Dr. Tipperman says the OPD's capability to efficiently provide data about a patient's high-order aberrations, pupillometry, and angle kappa measures were what initially drew the practice toward purchasing an OPD-Scan III.

"The OPD helps make toric and multifocal IOL evaluations easy," Dr. Tipperman says. "When you're seeing people



for an evaluation and they have a high degree of astigmatism keratometrically, you can look at their map and see how irregular things are and evaluate the quality of their tear film.”

Ophthalmic Partners uses the OPD-Scan III and opted to integrate with Marco’s companion Epic Refractive Workstation (with TRS-5100), according to Dr. Tipperman.

“One thing I think people overlook when they talk about advanced technology lenses is that the OPD is a very good autorefractor,” he adds. “The wavefront refraction it provides for both the photopic and scotopic pupil in one quick exam is very helpful clinically.”

Refractive Surgery

Tipperman and Ophthalmic Partners also offer refractive surgery procedures, including LASIK and PRK.

“The OPD Scan III provides data for planning refractive procedures, as well, since it provides very robust topographic data,” Dr. Tipperman says.

The OPD-Scan III also proves its value when working with cataract patients who have previously undergone refractive surgery. Dr. Tipperman points out that patients who were previously willing to have refractive surgery to improve their vision expect similar excellent outcomes from their cataract procedures. He uses the patient’s average pupillary power data from the OPD-Scan III in the ASCRS Post Keratorefractive Calculator for IOL power to achieve excellent outcomes for those patients.



Epic Workstation configured with OPD-Scan III Wavefront Aberrometer and TRS-5100 Digital Refractor

Dr. Tipperman says the practice also sees numerous cataract patients who have had prior laser refractive surgery and they commonly have some cylinder sculpted into their cornea, presumably to treat some lenticular astigmatism. When those

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— Richard Tipperman, MD

patients have their cataract removed, Dr. Tipperman says that astigmatism often manifests, making them potential candidates for a toric IOL. He adds that the baby boomer population of post-refractive surgery patients is expected to create a wave of cataract candidates with this issue in the coming years.

Accurate Data = Happy Patients

For Dr. Tipperman and his colleagues at Ophthalmic Partners, the OPD-Scan III efficiently provides accurate data so his team can successfully plan a wide range of cataract and refractive procedure.

“The OPD gives you so much information all at once,” Dr. Tipperman says. “It’s easy for the techs to acquire the data and easy for me to evaluate. That streamlines the whole process and allows us to provide much better care. The OPD helps provide a very high quality level of care and that helps build your practice over time.”

High-quality care with excellent visual results is how cataract and refractive surgeons get noticed, remembered, and referred to by patients who have been pleased with their efficient, high-tech experience and excellent visual outcomes. ■

Dr. Tipperman is a cataract and refractive surgery specialist with Ophthalmic Partners in Philadelphia.

Enhancing Cataract Surgery Outcomes

OPD-SCAN III PROVIDES SPOT-ON KERATOMETRY READINGS

Diligent pre-operative planning substantially increases the likelihood of satisfying patient expectations and achieving optimal results after surgery. In cataract surgery, because laser biometry measures axial length, anterior chamber depth, and lens thickness accurately, gathering and interpreting accurate K readings is the most critical variable in pre-operative planning. However, due to tear film variability, K readings are frequently inconsistent. Therefore, a device that allows doctors to review for consistent, reliable measurements is vital to successful surgery. Edward Hedaya, MD, has found the OPD-Scan III useful for obtaining great readings, and also for managing patient expectations and earning patient trust.

Many Devices, Many Results

A growing number of devices that measure K values are now on the market, but the method of data collection varies greatly. Each diagnostic device has its own particular data capture methodology and outcome for keratometry, corneal power, astigmatism magnitude, and axis. The results of each measuring device are not interchangeable, nor are they necessarily complementary. Further confounding the situation, some studies have shown high levels of variability in results obtained from the same device. If one reviews the

mechanism of data acquisition, this variability becomes more understandable.

An important factor in assessing the device(s) you own or plan to acquire is the ability to optimize your surgical constant. Because every device measures the cornea at different diameters, consistency, and spatial resolution, using one superior device for data collection prevents variability and helps to achieve the consistency that is necessary for optimization.

Fast, Reliable Data

The OPD-Scan III is an indispensable tool in pre-operative planning for cataract surgery, as surgeons must target more than just refractive emmetropia to augment satisfaction. In seconds, the OPD-Scan III collects and analyzes an immense repository of relevant ocular refractive data that can

be viewed in a variety of customizable viewing summaries based on each patient's particular needs. Doctors can achieve superior, targeted visual acuity by using properly selected surgical formulas, which are based on selecting the most accurate data collected by the OPD-Scan III.

The OPD-Scan III also has an alignment indicator to monitor that the patient is aligned properly to optimize image selection. "In our clinic, we've found that we can obtain the most





consistent measurements by studying the placido disc topographic measurements. The OPD-Scan III consistently measures 359 points at a 3.0-mm diameter, regardless of the corneal curvature radius," explains Dr. Hedaya. "Not only does it give us more consistent data sets, but also outstanding resolution for power and axis determinations."

Optimize Results

Diagnostic equipment is highly important, but how you use it is equally important. The OPD-Scan III takes consistent images of eyes, and more importantly, allows the user to view the placido images to determine what images are optimal for usage in calculations. It also provides tools essential for patient education and communication in the preoperative planning process. This results in enhanced outcomes and an educated patient with more concrete expectations.

Obtain Strong Images

The tear air interface is the most powerful refractive element in the eye. Obtaining an ideal image is impossible if the surface of the eye is not optimized. The placido disc images (and resultant topography) can reveal inconsistencies or imperfections that would need treatment to prepare the eye for re-imaging. "If we don't acquire sufficient images on the first attempt, we give the patient a preservative-free lubricant every 5 minutes for half an hour; then take more images. If the images are pristine, I use them; if not, we put the patient on a corrective therapy plan, such as Restasis (cyclosporine ophthalmic emulsion 0.05%, Allergan), omega-3 fatty acids, plugs, and so on, depending on the diagnosis," explains Dr. Hedaya.

Excellent placido images are a mainstay to obtain proper data for pre-operative planning. "You want the keratometry readings to be within 0.1 to 0.2 diopters of each other, as well as very close in axis," explains Dr. Hedaya. He finds it essential to use a spreadsheet to review collected K data (axis and power) after selecting the best placido images. A minimum of three scans are used in each eye to obtain

an average of axis and power used in the Holladay II formulas; outliers are thrown out. He says the extra 2 minutes to enter and review the data makes a significant difference in the spherical equivalent outcomes. His spherical equivalent results at 92% +/- 0.5 diopters.

Manage Patient Expectations

A sometimes-neglected opportunity in the pre-operative planning process is managing patient concerns and expectations. The OPD-Scan III is a great communication tool because surgeons can demonstrate to patients that they understand what they're seeing, which helps patients feel more comfortable with the doctor and less fearful of what they're experiencing.

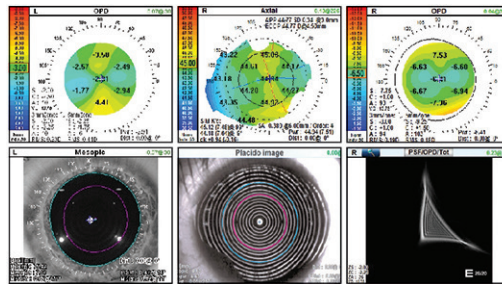
"Some surgeons are afraid to tell patients what symptoms they may experience after surgery because they fear that patients will opt out of surgery," says Dr. Hedaya. "But the opposite is true. If you don't tell patients what to expect, you may end up with an unhappy patient.

"We get multiple OPD-Scan III readings on every patient. We get them at pre-op, post-op, and then when needed. I explain to patients what's going on." After surgery, the OPD-Scan III has the simulated vision feature to remind patients of how their vision used to be, which is a great way to earn the trust and appreciation of patients. "After 6 months of better vision, they often forget how bad their vision used to be," says Dr. Hedaya.

Successful Surgical Outcomes

Successful cataract surgery is a result of superior surgical skill and proper pre-surgery planning and procedures. The powerfully designed OPD-Scan III allows surgeons to verify the pre-planning process by providing consistent, reliable data collection, as well as great patient education opportunities to help ensure the best surgical outcomes for your patients. ■

Dr. Hedaya practices as InVision Eye Care in Lakewood, NJ.



The Puzzle Solver

UNCOVER DATA TO IMPROVE YOUR REFRACTIVE CATARACT SURGERY RESULTS AND PROVIDE EXPLANATIONS THAT ENHANCE PATIENT SATISFACTION

Many cataract surgeons have experienced a surgical case they thought was a home run — one in which everything looked perfect and the patient was seeing 20/20 — yet the patient was very unhappy with the results. Cases like these can be frustrating for both patient and doctor. But, with careful preoperative planning and accurate data collection, they can be prevented.

The OPD-Scan III has helped Tim Page, MD, at Oakland Ophthalmic Surgery in Birmingham, Mich., mitigate these cases to ensure the home runs actually happen in his practice. His practice focuses largely on refractive cataract surgery and postoperative refractive cataract surgery consulting. In addition to providing optimal preoperative tools to collect data to strategize and perform the best possible refractive cataract surgery, the OPD-Scan III has helped to solve issues in patients who present with postoperative visual acuity problems.

Fast, Reliable Data Collection

In the span of 10 seconds, the OPD-Scan III provides Dr. Page with thousands of data points that enable him to break down various components of the eye to determine what factors are causing issues, and how to address them in his surgical plan

for each individual patient.

“One of the first things I look at when I examine the cornea of these patients is the spherical aberration,” says Dr. Page. Unlike standard topographers that simply indicate regular astigmatism, the OPD-Scan III also provides the patient’s spherical aberration in the cornea. “This feature has elevated my ability to achieve excellent outcomes in my refractive cataract practice because I’m able to match patients to a specific lens based on what I see from the aberrometry results,” says Dr. Page.

In addition to the topographic values measured by the OPD-Scan III, the placido image in the system aids in preparing the surgeon and the patient for expected postrefractive cataract surgery results. For example, the image can indicate abnormalities, such as dry eye. By explaining to the patient that the dry eye should be treated before — and

possibly after — the surgery, surgeons can better manage patient expectations. This is particularly important so that after surgery, the patient understands that the dry eye was a preexisting condition and was not caused by the surgery.

Enhanced Patient Education with Real-time Imaging

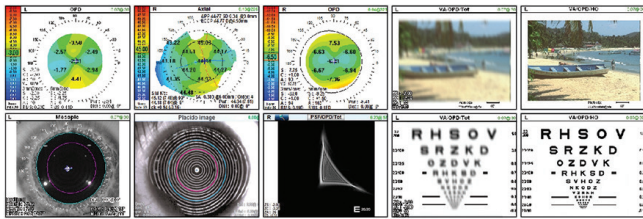
As part of the cataract consultation, Dr. Page looks at the





contribution of the cataract to the patient's loss of visual acuity. With the point spread function in the OPD-Scan III, Dr. Page can show patients exactly how the cataract affects the eye.

"I had a gentleman come in who was complaining of glare while driving at night. He drew what it looked like when cars were coming at him — a circle with rays coming out of it and some little jagged edges on it. When we did the OPD scan, we showed him the retroillumination image of his cataract, and he was able to see his cataract with these cortical spokes coming into the center of his vision. I said, 'This is what is causing the rays of light to occur.' It's almost universal that these patients nod their heads and say, 'Yeah, that's what I see.' It validates what is causing their trouble."



OPD-Scan III maps provide relevant data and patient education.

The imaging system in the OPD-Scan III goes beyond confirming to patients that the doctor understands what they see; it also allows doctors to educate patients about best options moving forward. Many cataract patients today are very savvy and do their own research before a consultation, so they come into the office with a good idea of what they'd like done. The OPD-Scan III can illustrate to patients presenting with an irregular cornea who may, for example, want a multifocal lens, that the multifocal lens could, in fact, worsen their vision.

Improve Post-operative Results

"When patients are having trouble with their eyes, the OPD-Scan III helps me uncover the cause, which often wouldn't be obvious with other technology and measurements," says Dr. Page. For example, Dr. Page had a patient with multifocal implants who was complaining of glare despite her refraction being almost plano. The OPD-Scan III revealed that she had a significant degree of coma in her cornea, which means she would likely not tolerate a multifocal lens well. This

is something a surgeon could never know with the standard technology used for a cataract evaluation because it doesn't measure these types of higher-order aberrations.

It isn't uncommon for everything to look good to the surgeon but for the patient to be complaining of visual acuity issues. In fact, Dr. Page sees a number of patients who have had cataract surgery from great surgeons but who are having some trouble seeing. For these patients, the OPD-Scan III is a critical part of finding a solution to their vision problem, as it will indicate whether the lens is tilted, the patient has astigmatism with the lens implant, there's higher-order aberration, or the IOL is decentered. "We figure out what's causing the dissatisfaction and adjust the lens accordingly," says Dr. Page.

The point spread function enables doctors to break down the components of the eye and demonstrate that they understand what the patient is describing. Postoperatively, this is important, as patients who hear from the surgeon, "Everything looks great; you're 20/20," are frustrated because they can't validate what they're experiencing. "Seeing that the doctor understands is an 'Ah-ha!' moment for them. It's a lot of fun," says Dr. Page. "The OPD-Scan III has really been a puzzle-solver; it has been a key to solving problems for many these patients who you would expect to be happy but are not, and it allows us to give them some answers and options."

Better Data, Better Results

Running the scan takes the same amount of time as doing so on a standard topographer, yet the results from the OPD-Scan III provide thousands more data points that can illustrate to the patient what is going on in the different parts of his eye. Although this may increase the consultation time, the benefits of these additional data points more than make up for it. "My consultations for cataract surgery are a little bit more time intensive and it does take a little more time to explain the relevant data to patients, but it is quality time," says Dr. Page. "The level of appreciation I get from my patients by going through this pays off in spades." ■

Dr. Page practices at Oakland Ophthalmic Surgery in Birmingham, Mich.

Customize Your Data

OPTIMIZE RESULTS WITH CUSTOMIZATION FEATURES PROVIDED BY THE OPD-SCAN III

Going into surgery, physicians need the most relevant and accurate data possible so they can be confident that the procedure will yield the results the patient wants. Pre-op planning involves interpreting the data and engaging with the patient to make the best decision for treatment. The OPD-Scan III provides all of the information necessary to make these determinations through customized maps that are generated automatically each time a patient is scanned.

Customized Data

The customized maps from the OPD-Scan III are invaluable resources in my practice. After a scan, I immediately receive maps with the data that will help me make informed decisions about diagnosing the patient and deciding on a treatment plan. For example, through a number of different criteria provided on the cataract evaluation map, we can determine before the procedure whether the patient will have a poor, questionable, or reasonably good result with a particular multifocal lens.

There are several key data points — such as the angle kappa, corneal coma, aberration, and topography — that can greatly influence outcomes. Typically, our maps include not just topography, but also the internal OPD results and the combination of the internal and topographical OPD results. These data points allow us to see what exists on the surface of the eyes as well

as what exists internally. Understanding the eye internally before surgery helps us to avoid certain IOLs that could make the condition worse. For example, if someone has a great deal of spherical aberration in one direction or the other, then we would avoid certain implants that could worsen their vision post-op because of increased spherical aberration. Any aberrations, irregularities, or astigmatism that may be attributed by the cataract itself are made evident in the maps. With this customized information, we can make a more informed decision about multifocal lenses or any IOL.

Because there are many different maps available, you can customize the settings to provide whatever information you need to make a decision.

We have a number of other physicians who recently joined our practice and they are very interested in the OPD-Scan III. It's great that they can each personally customize the data, so the maps will suit their particular needs and preferences.





Marco Support

Because the settings are customized for my purposes and preferences to provide all of the information I need, I rarely need to change any settings to retrieve different data types. Initially, I worked closely with representatives from Marco. They have been an invaluable resource over the years. We were able to design the perfect mix almost from the beginning because they knew what I wanted and what I look for, and their suggestions helped me consider what other information might be beneficial to me.

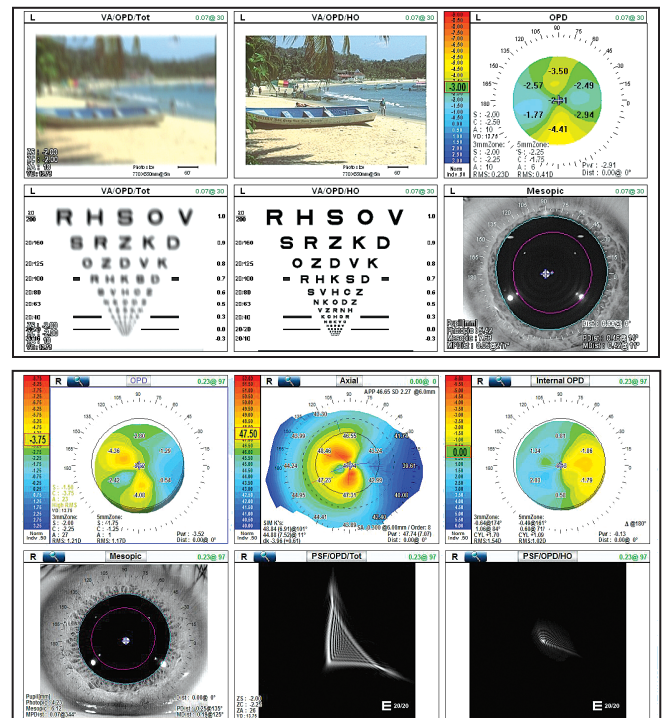
Beyond helping us set up the program, the Marco support team also helps us troubleshoot when we aren't able to identify an issue in a particular patient. They learn from other physicians' experiences so they have a deep database and knowledge base, which can help us navigate difficult cases.

Engaged Patients

The maps are very valuable — not only clinically for assessing data and selecting an IOL — but also for demonstrating to the patient what is going on with their eyes and how the planned procedure will help. With the maps, we can show what the cataract looks like, what the topography looks like preoperatively, as well as if an IOL is tilted or if there is a reason for unanticipated visual phenomena postoperatively. My patients have responded very favorably to the technology. Engaging patients in the data discovery and diagnosis is important so that they understand what is going on with their eyes and why certain treatment decisions are made.

Key Benefits

In my experience, the key benefit of the OPD-Scan III is its ability to help us to more accurately determine who is a good candidate for multifocal lenses, and, further, which type of multifocal lens might be best. Since acquiring the OPD-Scan III, I haven't had to explant any IOLs due to post-op discovery of an irregularity, an angle kappa problem, or wavefront aberration problem. With the OPD-Scan III, I'm



Customize data maps by patient (two examples shown).

able to identify any potential problems before surgery so I can make an educated assessment and proper recommendation to my patients.

There was a patient whose acuity changed over time causing distortion. The OPD-Scan III was able to show that the anterior capsule was actually tilting the IOL due to capsular phimosis. As a result, we were able to perform an anterior capsulotomy to release tension on the implant, which allowed it to move into a more normal position, ultimately decreasing the patient's visual complaints.

Better Data = Better Results

With data that can be customized to fit my specific needs, I am able to diagnose and treat patients more efficiently and effectively. Better data leads to better post-operative results, which, in turn, leads to greater patient satisfaction. ■

Dr. Gold moved to the Berkshires in 2001 to begin his own private practice in Great Barrington, MA, where he has served for many years on the Medical Executive Committee and more recently as Chief of Surgery at Fairview Hospital.

Better Information, Better Outcomes

AN IMPROVEMENT ON AN ALREADY SPECTACULAR PIECE OF EQUIPMENT

I purchased the original OPD-Scan 8 or 9 years ago, and upgraded to the OPD-Scan III in December 2014. The original OPD-Scan was an absolutely spectacular piece of equipment, and the OPD-Scan III was enough of an improvement that I thought it was worth my while to make the investment. After more than a year, I am confident that I was right.

Better Delivery of Information

The OPD-Scan III is clearly an improvement on what was already great technology. It provides much of the same useful information but in an improved format, and in an easier, more efficient manner. The OPD-Scan III has better resolution and interface, and provides useful, integrated summaries that weren't readily available in the original model. For example, now my techs can easily obtain a cataract, cornea, diagnostic, or toric summary for me to review and make assessments.

Corneal Wavefront Integration

The ability of the OPD-Scan III to examine the corneal wavefront is a huge improvement, because it helps me to determine the best course of treatment, be it LASIK or cataract. It also helps provide an overview of the patient's visual status and problems. Every LASIK or cataract evaluation patient has those scans prior to me even walking into the room, so I have a vast amount of relevant information right in front of me. With better information, I

am able to achieve better outcomes for both refractive and cataract patients.

Improved Decision Making

The OPD-Scan III makes my job much easier, and it helps me achieve the best possible outcomes. Let's say, for example, a patient is in for cataract surgery. I can easily explain to the patient which lens I want to place based on the information that the OPD-Scan III provides.

In addition, if I'm considering a multifocal IOL, I can evaluate the corneal wavefront aberrations and quickly make

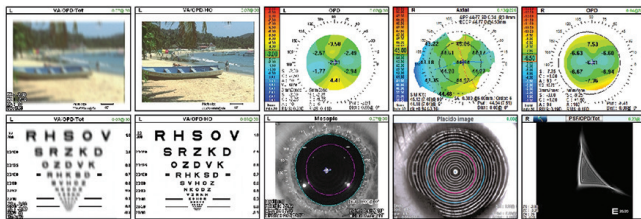
**OPD-Scan III
Integrated Wavefront
Aberrometer**





an educated decision as to whether or not the patient is a good candidate for a multifocal IOL, based upon the corneal aberrations that I'm seeing. Or, the information might help me realize the patient is a better candidate for a different lens. I can look at the topography and the regularity of the astigmatism in the corneal surface. The OPD-Scan III is also very good at helping to assess corneal astigmatism.

I'm also able to help patients with less-than-perfect vision after cataract or LASIK procedures, whether performed by me or another physician, because data from the OPD-Scan III can help me figure out what is going on with the patient's vision. It also allows me to see what astigmatism might be coming from inside the eye — either inside the lens and/or the posterior cornea.



I have many referrals, complicated patients, or patients who are not seeing well after cataract or refractive surgery, and the ability to take all of these measurements and look at all of the various pieces of information often helps me identify the patient's problem. This, in turn, helps me make a determination as to what is the right solution for the patient.

Technicians' Seal of Approval

Because my technicians perform the tests with the OPD-Scan III, it is critical that my staff is proficient in using this technology. It is equally important to me that they like the equipment — and they do. My techs appreciate that the information from the OPD-Scan III is more detailed and the equipment is more user-friendly than the previous model; they have fully embraced its capabilities. And because the OPD-Scan III harvests more than 23 diagnostic metrics in 10 seconds per eye and provides so much integrated

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information, my technicians often will make a decision for a given patient as to what summary I might need, which is extremely helpful. Sometimes, I have to go back and ask for a different summary or scroll through different images, but that's simply because there is so much information available at my fingertips if I need it.

An Office Favorite

If you're looking to provide improved care for your cataract and LASIK patients, there is no question that the OPD-Scan III is worth the investment. The equipment is fantastic, and the customer service that Marco provides is remarkable. The support team comes in to help customize and set up the summaries that will best suit each office's needs. They are always accessible and helpful.

There are many pieces of equipment that I have and love, and I could probably get away with just using them. But I wouldn't be seeing the whole picture concerning each patients' optical path. With the OPD-Scan III, I can obtain the basic information — and so much more. There are so many things that this piece of equipment can illuminate for me, that I'm sure I haven't even scratched the surface yet. It's my favorite piece of equipment and I can't imagine practicing without it. ■

Dr. Horn specializes in cataract and laser eye surgery at Vision for Life in Nashville, Tenn.

Achieve Results and Manage Expectations

HOW THE OPD-SCAN III IMPROVES OUTCOMES AND THE PATIENT EXPERIENCE FROM START TO FINISH

It is my belief that an excellent postoperative patient result begins with detailed attention to preoperative testing. With its diverse pre- and postoperative evaluation capabilities, the OPD-Scan III has improved my surgical outcomes and has increased overall patient satisfaction. Furthermore, I use the images on the OPD to discuss diagnoses and treatment plans with patients.

Pre-op Screening for Optimal Post-op Results

To achieve the best postoperative results, we must screen patients preoperatively to identify certain corneal disorders that may affect outcomes. The OPD-Scan III measures a large amount of data, all of which are helpful in determining the best treatment options for patients. We are constantly finding new ways to maximize its advantages. The OPD has led to reduced postoperative issues and complaints by helping me to properly select those patients who would be good candidates for premium IOLs.

For example, the OPD identifies corneal diseases — such as irregular astigmatism, higher-order aberrations (corneal coma or corneal trefoil), high or low spherical aberration, and visually significant pterygiums with irregular astigmatism extending into the central pupillary zone. In each of these situations, the patient would be considered a poor candidate for a multifocal IOL.

I also evaluate the placido rings to look for irregularities. Irregular placido rings can be caused by a wide variety of corneal diseases, including dry eye disease, pterygiums, keratoconus, Salzmann's nodules, corneal scarring, and epithelial basement membrane disease. If I decide to treat the corneal disease prior to cataract surgery, I obtain a repeat scan after surgery to show patients the subsequent improvement

in the placido rings. This helps demonstrate the benefits of having an additional surgery prior to cataract surgery.

The OPD is especially helpful for identifying subtleties of dry eye preoperatively that I may not have otherwise noticed. It is easily seen as irregular placido rings, which can be shown to patients for educational purposes. From there, we begin a more thorough dry eye evaluation. After treating the dry eye, I repeat the preoperative testing and IOL calculations. Always address dry eye disease before surgery.

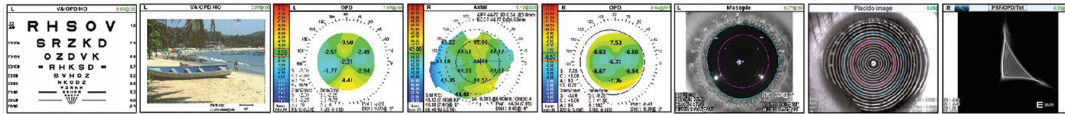
In addition, I evaluate all patients who have had previous LASIK, PRK, or RK. I am looking for irregular astigmatism, high spherical aberration, or a decentered ablation. I discuss these findings with patients preoperatively, explaining that prior refractive surgery may affect their final postoperative result, and because of this, it is possible that not all glare or decreased contrast sensitivity problems will be resolved.

The OPD also measures corneal spherical aberration, which allows me to customize my choice of IOL to best correct it. This helps to optimize each patient's postoperative visual outcome.

Pre-op Screening of Premium IOL Patients

The OPD is especially valuable when evaluating patients who are interested in a toric IOL. The axial map is useful in confirming the planned axis for the orientation of the toric IOL, which should be very similar to the axis obtained via optical biometry. If the axis from the axial map and optical biometry are not similar, I repeat testing and look for the previously mentioned corneal disorders.

The OPD-Scan III also assists me in the multifocal IOL decision-making process. When evaluating multifocal patients preoperatively, I look for corneal disease. In general, the more irregular the cornea, the less likely I would be to use a premium IOL. For example, if a patient has significant higher-



order aberrations, I would not use a multifocal IOL. In addition, I evaluate the mesopic and photopic pupil size. If the mesopic pupil size is greater than 6 mm, I have a discussion with the patient about an increased risk for halos and glare postoperatively. However, if the patient has a small photopic pupil less than 3 mm, I generally use a multifocal IOL in which the near vision isn't dependent on pupil size. I also use the OPD to evaluate angle kappa. If angle kappa is greater than .43 mm, I use a multifocal IOL with a larger central zone.

Consistent Results with Post-op Screening

I obtain postoperative OPD-Scan III studies on all of my multifocal patients. Approximately 1 week after surgery, I obtain a dilated reading. This allows me to see if the central zone of the IOL is centered within the visual axis of the patient. If not, I know the IOL has shifted postoperatively, which frequently results in patient complaints of decreased vision and glare. Complaints usually can be resolved by surgically repositioning the multifocal IOL onto the visual axis.

I will also perform an OPD scan 1 week post-op on patients who received a toric IOL. Again, the scan is obtained with a dilated pupil. In this way, I can measure the axis orientation of the toric IOL to ensure that the toric IOL didn't rotate away from the intended axis of surgical orientation. Correct toric alignment is critical because the power of the astigmatic correction is reduced 10% for every 3 degrees away from the intended axis of orientation. If there is significant rotation of the toric IOL, I will take the patient back to the OR to realign the toric IOL to the proper orientation.

More Information = Happier Patients

The OPD-Scan III has significantly reduced the number of post-op complaints from patients. With more information to guide me through the entire process, I've been able to largely avoid unhappy multifocal IOL patients by identifying the best candidates up front. Before we acquired the OPD, we were inconsistent when making these pre-op decisions.

Making the right decision as a surgeon is only one component of meeting or exceeding patient expectations. It's also important that I educate patients at each step along the way. Pre-op tests help me manage expectations by educating patients with the aid of easy-to-understand test results. Visual aids help explain variables to improve patient understanding. For example, using OPD results, I can show

a patient that his lens is well centered and his toric IOL is well positioned. Patients can see irregular placido rings consistent with dry eye syndrome, which reinforces the need to treat their dry eye prior to surgery.

Imaging can also show patients why irregular astigmatism may prevent them from being premium IOL candidates. With this information and education, patients better understand why you're making certain decisions, they recognize that you're trying to make the best decision for them — and they appreciate that.

Customization = Efficiency

The varied capabilities of the OPD allow us to create a specific map for pre- and post-op testing to meet the needs of each patient. We created a customized map to include all the important information we need to preoperatively evaluate the patient. By consolidating all the important measurements on one map, pre-op patient evaluations are much more efficient and allow us to create a personalized treatment plan for each patient. It's amazing how many options there are with this instrument. We have customized it for our needs, and certainly other offices can adjust their maps to accommodate their needs as well.

We have also developed a comparison map to evaluate pre- and post-op LRI data to evaluate femtosecond laser LRI treatments. The outcome analysis can be used to adjust your LRI nomogram for any under-correction or over-correction of astigmatism. You may also use the comparison map to look for any increase or decrease in higher-order astigmatism, which may occur after an LRI.

Improve Satisfaction and Results

We acquired the OPD-Scan III about 5 years ago in an effort to improve our outcomes and patient satisfaction. It has delivered by helping us to preoperatively detect corneal issues that may affect outcomes, identify the best candidates for premium IOL surgery, improve surgical outcomes, and increase patient satisfaction. ■

Dr. Ludwick specializes in cataract surgery and is the Medical Director at Ludwick Eye Center, with locations in Maryland and Pennsylvania. He is also an assistant clinical professor at Penn State Hershey Medical Center.

The OPD-Scan III: Great Things in a Small Package

**MULTI-FUNCTIONALITY IMPROVES PATIENT OUTCOMES,
THUS HELPING YOUR PRACTICE GROW**

As my second office location continued to show growth, I began my search for an autorefractor and corneal topographer with the goals of improving my practice flow and providing more in-depth anterior segment and corneal imaging. I was looking for quality imaging that would help my staff corroborate biometry measurements and support keratometry measurements as well.

It didn't take me long to find the right product — and far more — in the OPD-Scan III.

Versatility: Multiple Tools in One

As an ophthalmologist, the characteristic that appealed to me most about the OPD-Scan III is its versatility. Aside from the autorefraction and topographic capabilities I initially sought, its many other features include keratometry, wavefront aberrometry, lenticular-residual astigmatism, angle alpha/kappa, mesopic/photopic pupil size, a corneal refractive power map, wavefront-optimized refraction, day/night refraction, electronic medical records compatibility, network integration, and available viewing software for the exam lane. Moreover, all of this comes packaged in one compact, space-saving unit that fits out of the way on a power table.

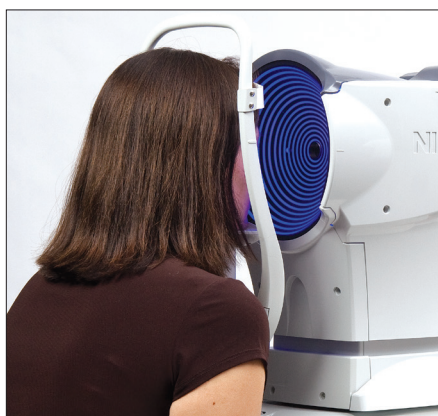
But another equally significant reason I acquired the OPD-Scan III is its ability to provide iris registration data to the Lensar femtosecond laser system. We were already using the Lensar system in the surgical center where I perform refractive cataract surgery and other surgical procedures, so the OPD-Scan III's ability to seamlessly share data with the Lensar system was a very welcome bonus.

Having the iris registration information for my surgical patients saves time in the operating room, because I no longer need to spend time sitting patients up and marking their eyes for toricity. Two or three minutes per patient may not sound like much, but the minutes add up, contributing significantly to surgical patient throughput and allowing for me to finish my day earlier.

Indeed, this ability has enabled me to perform my surgical procedures with

increased confidence and accuracy, as it has allowed me to account for cyclotorsion changes in my patients' eyes. In addition, the plethora of information delivered by the OPD-Scan III helps me to better determine candidates for advanced technology intraocular lenses, such as multifocal lenses and extended depth-of-focus lenses.

The marriage of the OPD-Scan III data with my biometry





data substantiates my measurements, giving me more confidence in my surgical planning, and better surgical outcomes. It virtually eliminates the need to bring back patients for repeat keratometry measurements. The spherical aberration data we obtain from the unit also helps guide my monofocal intraocular lens selection. The angle kappa information helps to eliminate poor multifocal lens candidates, and the corneal wavefront aberration findings are very helpful in this respect, too.

Easy to Learn and Use

The learning curve on the OPD-Scan III could not be

Reasons to Recommend the OPD-Scan III

The advanced technology found in the OPD-Scan III helps to deliver the best possible patient outcomes and will, in turn, help to grow your practice. Other considerations are:

- **A compact unit offering the function of five machines.** In the past, the only option was to use multiple devices to obtain diagnostic measurements on patients. The OPD-Scan III offers topography, wavefront aberrometry, auto-refraction, keratometry, and pupillometry, plus so much more, in one small tabletop unit.
- **Integration with the Lensar femtosecond system.** Its ability to deliver iris registration data to the Lensar femtosecond laser system enables ophthalmologists to perform surgical procedures with greater confidence and accuracy. The OPD-Scan III also increases surgical throughput by eliminating or reducing time spent marking eyes for toricity.
- **Fast data acquisition.** Everyday patient throughput also increases with the use of the OPD-Scan III, whose autorefractor, keratometer, pupillometer (up to 9.5mm), corneal topographer, and wavefront aberrometer all acquire numerous diagnostic metrics in less than 12 seconds per eye — all at once.
- **Ease of operator training.** Its touch-screen interface, drop-down menus and intuitive diagnostic categories make staff training quick and easy, with most trainees actively testing patients within one hour or less.

easier. In my experience, typical staff training on diagnostic equipment can vary anywhere from less than an hour to several hours, depending on the complexity of the equipment and software. The touch-screen interface of the OPD-Scan III, which allows for easy access to drop-down menus, and its intuitive diagnostic categories, facilitate staff learning of the OPD-Scan III within an hour or less and allows them to get started on patient testing right away.

Optimal for Patient Throughput, Education, Referrals

Since the OPD-Scan III serves as so many different tools in one to get multiple diagnostic measurements of the eye, saving technician and workup time to get the patient ready to be seen by the physician, it helps significantly with daily patient throughput. Indeed, the unit is fast — taking only a mere 10 to 12 seconds to acquire some 20 diagnostic metrics per eye, including, to mention a few, angle kappa, higher-order aberrations, pupil measurements, RMS value, and point spread function.

The OPD-Scan III has been a big help in our practice, which has grown to serve hundreds of patients per month across our two locations in Fredericksburg and Culpeper, Va. A high percentage of our volume is comprised of surgical procedures, while the rest consists of medical consults and other types of examinations.

I use the data acquired by the OPD-Scan III to show my patients their measurements, anatomy, and how I use the information in their surgical planning. The viewing software allows for reviewing the findings from the OPD-Scan III in the exam lane. Patients appreciate the advanced technology we're using to measure their eyes for surgery, and I've found that they refer other patients to our practice based on their own excellent surgical outcomes. ■

Dr. Jani, a voluntary assistant clinical professor at the University of Virginia, is the president and founder of Vista Eye Specialists, which provides surgical and medical eye care in central Virginia.

XFRACTIONSM

Optical Path Diagnostix & Wavefront Optimized Refraxon

XFRACTIONSM

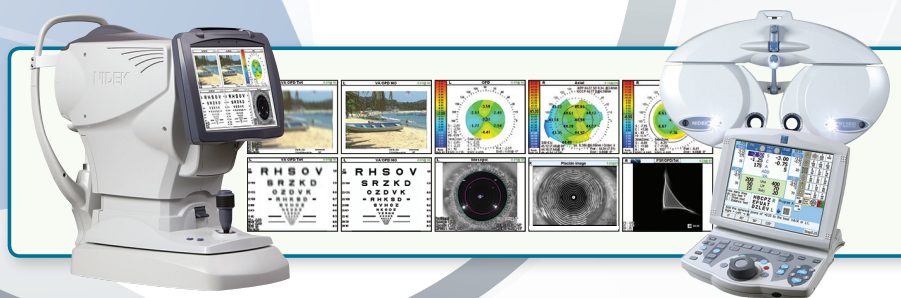
**is a groundbreaking refractive process
for today's thriving eyecare practice.**

In this process, unique Optical Path Diagnostix are employed to define the physiological alignment of all optical path components. The OPD-Scan III runs over 20 diagnostics, corneal analytics, aberrometry, topography, pupillometry, and establishes the correct refractive starting point. This data is directly transferred to the TRS-5100 digital refractor, where either minor adjustments or full refractions are completed in Wavefront Optimized Refraxes.

Digital refractions are reduced by 5 to 7 minutes on wavefront patients (compared to manual refractions), and the vast diagnostic information about the patient's optical pathway provides full understanding of their physiological optics — only possible with the addition of unique Marco wavefront technology. Other benefits include greater time efficiencies, superior patient flow, daily patient capacity increases, and more quality time with each patient to educate or explain patient services. Patients requiring cataract and/or refractive procedures will also benefit from optimized IOL selections and surgical outcomes.

The overall patient experience is greatly elevated through shorter wait and exam times, more time for doctor interaction/consultation, and greater satisfaction with prescriptions. In addition, the advanced technology experience is one that is reflected in higher patient loyalty and positive references to the practice.

Contact us at www.marco.com to hear direct practice testimonials.



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