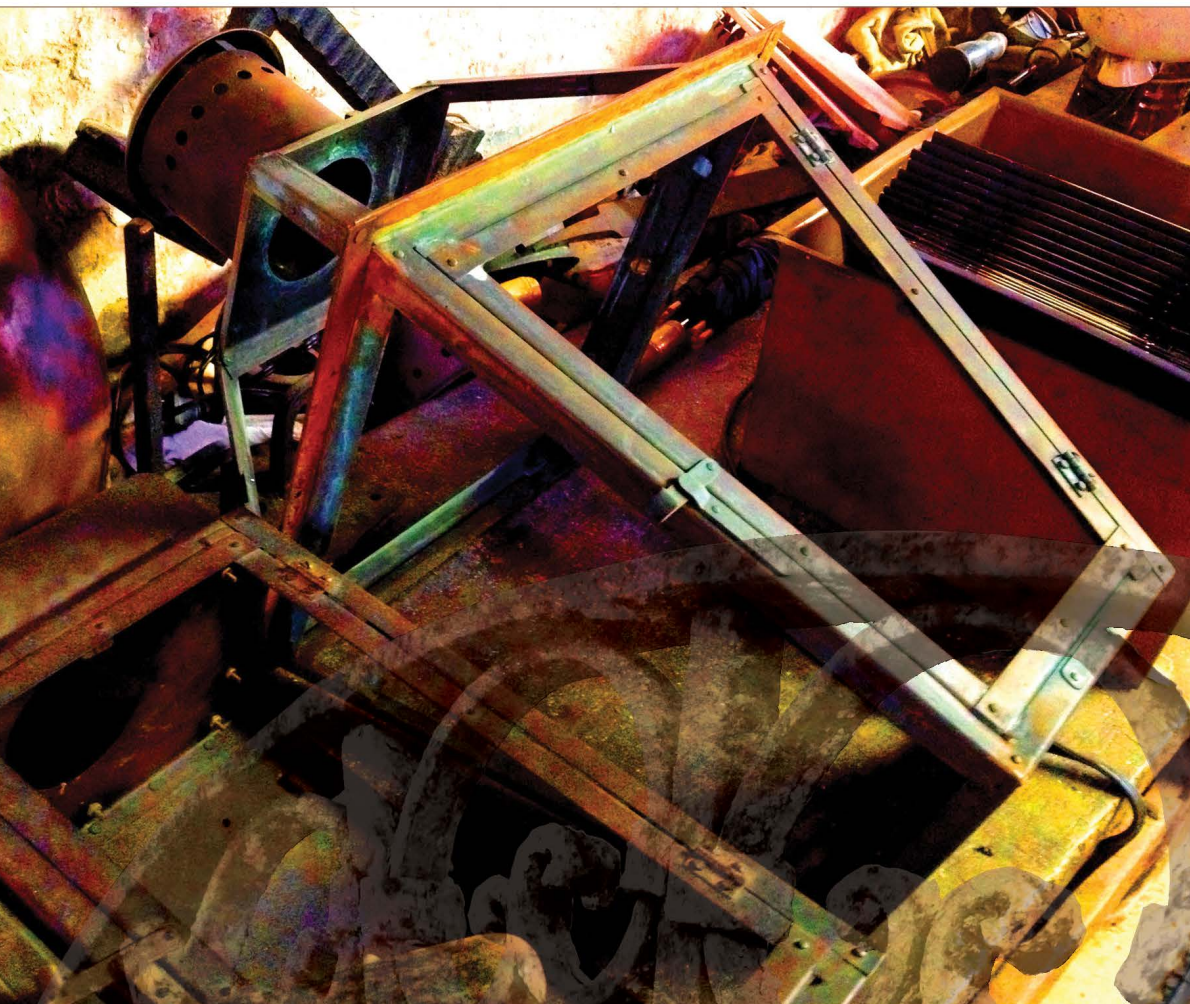









Luminary Insights

Enhanced Wavefront Refractions and Outcomes



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-  Mitchell A. Jackson, MD
-  Cynthia Matossian, MD
-  Joseph C. Noreika, MD
-  James J. Salz, MD
-  Jonathan D. Solomon, MD
-  Farrell "Toby" Tyson, MD

Highlights from a live symposium held during the 2013 meeting of the American Academy of Ophthalmology in New Orleans, LA.

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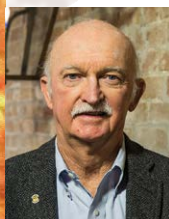
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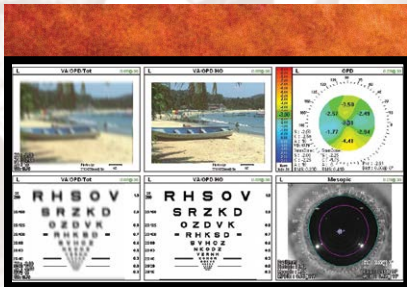
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Highlights from a live discussion held at the Bevolo Lighting Company in New Orleans during the 2013 meeting of the American Academy of Ophthalmology

Larry E. Patterson, MD: A number of years have passed since the introduction of wavefront technology. As pioneers in its development, what do you feel have been the greatest advances and general applications of wavefront in the past few years?

Mitchell A. Jackson, MD: New wavefront technologies are now able to capture a large amount of diagnostic data in a short period of time, which allows us to make more confident clinical decisions at a reasonable cost with a profitable return. With challenges such as reduced reimbursements and increased overhead costs, we need the improved outcomes, efficiencies and profitability that new diagnostic systems provide.

Farrell "Toby" Tyson, MD: We experienced an explosion in lens technology, but it was difficult to match each patient with the lens that would be of the most benefit. Now we have the ability to quickly and efficiently analyze the patient's vision, looking at everything as a whole, so we can decide which lens technology is best for that individual.

Cynthia Matossian, MD: Because patient expectations are high, it's become critical that we use wavefront technology to select and customize implants for each patient. In addition, the maps help me educate patients and engage them in the decision-making process.

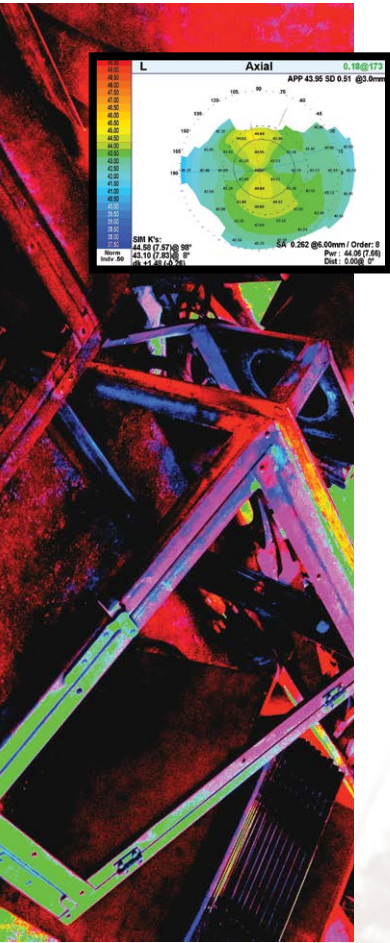
Joseph C. Noreika, MD, MBA: We need to be almost perfect to meet the expectations of today's cataract patients. That's where this technology really shines. It gives us more data, so we can make better informed decisions.

Jonathan D. Solomon, MD: I think the most interesting aspect of wavefront technology is that it allows us to look at a patient whose specific needs or conditions are unclear, understand what's going on in the eye and ultimately help him achieve his visual goal.

James J. Salz, MD: Without wavefront technology, you can have patients with 20/20 results who are unhappy with their vision, and you don't understand why. Wavefront technology presents the aberrations in a graphic way, showing us exactly why those patients are unhappy. It's also a great way to teach patients about their eyes and show them how surgery will address their existing aberrations.

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Enhanced Wavefront Refractions and Outcomes



"I can actually use our EHR system to show the OPD-Scan III images. With these images, patients can see that by correcting lenticular astigmatism with cataract removal, the corneal astigmatism will remain unless a toric IOL is used."

— Mitch Jackson, MD

Getting a First Look

Dr. Patterson: What's the first step you take when evaluating a patient who will be undergoing cataract surgery?

Dr. Jackson: I examine the ocular surface for signs of dry eye and other potential problems. I use the OPD-Scan III to obtain a clear placido disk image. Astigmatism is very important as well. I use several advanced lens technologies such as tear lab osmolarity to assess the ocular surface, OCT imaging to assess the macula preoperatively, and the OPD-Scan III to assess corneal topography, spherical aberration, and angle kappa preoperatively. The OPD-Scan III system allows me to see if the patient has corneal astigmatism or lenticular astigmatism. I can actually use our EHR system to show the OPD-Scan III images. With these images, patients can see that by correcting lenticular astigmatism with cataract removal, the corneal astigmatism will remain unless a toric IOL is used.

For post-LASIK cataract patients, the spherical aberration and coma help me decide if I should choose an aspheric lens or a negative spherical aberration lens. Finally, I evaluate angle kappa to determine if the patient should receive a multifocal lens. The OPD-Scan III allows me to capture all of these important factors in seconds.

Understanding Spherical Aberrations

Dr. Patterson: For years, we've been implanting lenses without information about spherical aberrations. Do they really matter? In your practice, do you match patients to IOLs based on their corneal spherical aberrations?

Dr. Tyson: That's a great question. I believe many people think spherical aberration probably doesn't matter. But we have to ask, now that we're really hitting our sphere and cylinder targets, how can we further reduce the error in the

system? Since we know from Warren Hill's data that the best we'll get on average is about .18D from the target,¹ how can we remove the rest of the error in the system to achieve better results, and ultimately, happier patients? The answer is, we can treat spherical aberration, and several lens manufacturers are making lenses to treat it. Using the OPD-Scan III, we're able to measure the corneal spherical aberration, so we can choose the lens that will get it as close to zero as possible.

When you address spherical aberration, patients experience better contrast sensitivity. Even if they have some residual sphere and cylinder, they can still be 20/20. That makes a surgeon's life easier.

Getting ROI from Wavefront

Dr. Patterson: How does wavefront technology improve your return on investment (ROI)?

Dr. Matossian: When I purchased my OPD-Scan III, I set up a plan to create a positive return on my investment. Every one of my patients who is scheduled for cataract surgery gets an advance beneficiary notice (ABN). As I explain to them, without the data from this instrument, I can't choose which lens is best for them. Patients sign an ABN and pay the charge for this service. The system also helps pay for itself by increasing the volume of discussions around premium IOLs, which in turn helps me get more word-of-mouth referrals.

Dr. Salz: The Marco unit also provides exceptional autorefraction, and it does so very quickly. Saving time makes money.

Dr. Noreika: That's an important point. A discussion of ROI should include the revenue side and the expense side. Our practices' biggest line-item expense is staff, so technology investments make sense if they decrease labor costs. The OPD-Scan III

accomplishes this. There's no need for a highly skilled technician with a high level of expertise to acquire the data, so that drives up our ROI.

Dr. Jackson: We don't need as many technicians. I average two or three more patients per hour with the EPIC station and OPD-Scan III and need fewer technicians. As Dr. Matossian mentioned, our operational costs are increasing just as our reimbursements are decreasing. This type of new technology presents a great way to help even out that imbalance.

What's more, this level of detail is nearly equivalent to a "fingerprint" of the eye. When you apply this technology to your patients, in essence, every one of them becomes a premium lens candidate.

Educating Patients Visually

Dr. Patterson: Before we had wavefront technology, how did you educate your patients about their needs and the potential benefits of premium IOLs? And now that we have wavefront technology, how has your approach to patient education changed?

Dr. Noreika: When I attended the AAO meeting in 1979, there were no screens. And when I implanted my first multifocal lenses in 1991, those patients didn't have questions. The doctor knew best.

Fast forward to today, and I've got a laptop, two large flat screens and a visual acuity screen in my exam rooms. It's not enough that the data positions us to make the best decisions in terms of outcomes and expectations. Our "Boomer" patients want to be part of the process. You've got to show them. The more you show them on the screen, the more they understand and the happier they are with their outcomes.

Dr. Solomon: I think the flexibility of the imagery is great. If a patient is savvy enough to appreciate an axial map, that's wonderful, but I don't see much of that in

my practice. However, I can use the system to show patients some really wonderful illustrations of what their vision would be if we didn't address the higher-order aberrations. They can see the distortion that they could expect after surgery. This finicky group of patients, with whom we'll be working for many years, wants information. This is the best way to transfer that knowledge.

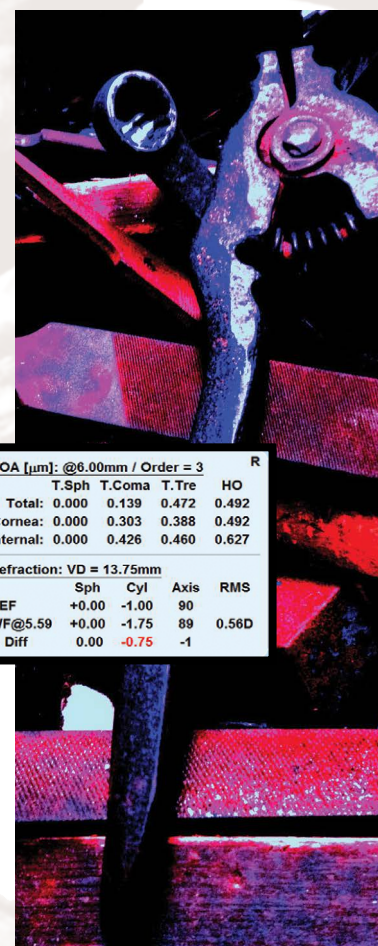
Dr. Jackson: A picture is worth a thousand words. The OPD-Scan III system integrates easily with our EHR, which displays the pictures right in the exam room. It minimizes chair time and maximizes the true discussion time. I show patients a picture and say, "This is why I've chosen this advanced lens implant technology for you." They understand immediately, so I can move on to the next patient in less time.

Aligning Toric Lenses

Dr. Patterson: I want to discuss toric IOLs since we're using them more often. How do you mark for your toric IOLs, and does retroillumination help with that?

Dr. Solomon: We just talked about how a great illustration makes it easier for patients to understand their vision, but quite honestly, clarity is better for surgeons as well. By getting the information from the OPD-Scan III and using lenticular landmarks in the retroilluminated image, we can triangulate the steep axis based on those landmarks to achieve an accurate representation of the steep axis location very simply. That gives us a great idea of how to align the toric lens. In doing so, we reduce our residual refractive cylinder by more than 50%. It's such a remarkably easy way to make that alignment, and the outcomes speak for themselves.

We also can show patients how the toric lens is placed using the marks and alignment. The technology is wonderful for the surgeon and impressive for the patient.



HOA [μm]: @6.00mm / Order = 3 R				
	T.Sph	T.Coma	T.Tre	HO
Total:	0.000	0.139	0.472	0.492
Cornea:	0.000	0.303	0.388	0.492
Internal:	0.000	0.426	0.460	0.627

Refraction: VD = 13.75mm				
	Sph	Cyl	Axis	RMS
REF	+0.00	-1.00	90	
WF@5.59	+0.00	-1.75	89	0.56D
Diff	0.00	-0.75	-1	

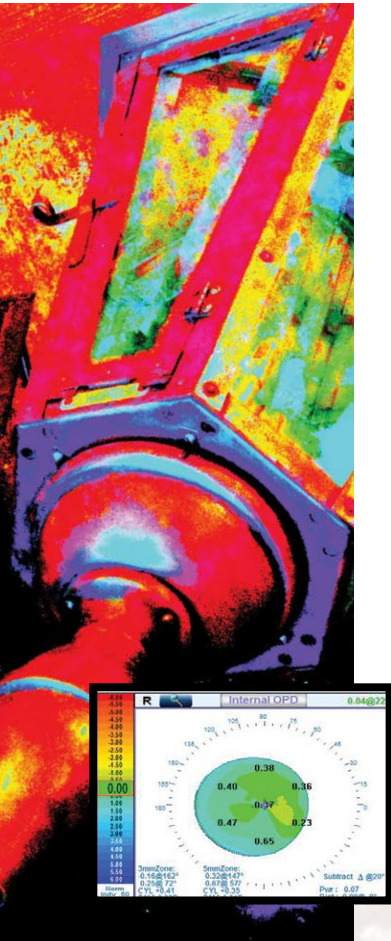
"... without the data from this instrument, I can't choose which lens is best for them."

— Cynthia Matossian, MD



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photopic conditions, they don't come down below 3.6 mm — the size needed for some multifocal lenses. If you get this measurement before surgery, you find the problem that went unnoticed in this patient, and your patient is happy with the outcome.

Considering Angle Kappa

Dr. Patterson: Do any of you measure angle kappa? If so, what role does angle kappa play in your decision-making, especially for multifocal IOLs?

Dr. Jackson: I presented a retrospective study of angle kappa at ESCRS.² We looked at a subgroup of patients who were unhappy after receiving multifocal IOL implants with 20/20 outcomes. We checked the ocular surface and osmolarity, noted patients who had YAG laser capsulotomy, and made sure OCT scans were normal. These common problems didn't provide a reason for dissatisfaction.

We did find that patients who had an angle kappa greater than 0.4 mm typically had more complaints of waxy vision or night vision issues. As a result, when I see patients preoperatively, one of the first things I evaluate is angle kappa, and I don't use a multifocal lens if it's greater than 0.4 mm.

Dr. Tyson: We can argue the benefit-to-risk ratios for multifocal lenses, but I think we all agree on the benefits of astigmatic reduction in cataract surgery. If there's a measure of angle kappa, even with the toric implant, there's a degree of induced higher-order aberrations, coma in particular. But when you have a patient sitting in one chair getting multiple measurements, you'll gain a very good understanding of the patient's line of sight relative to his pupil entry, or even to the vertex of the cornea. This goes a long way toward understanding higher-order aberrations that would have gone unmeasured.

Evaluating Corneal Coma

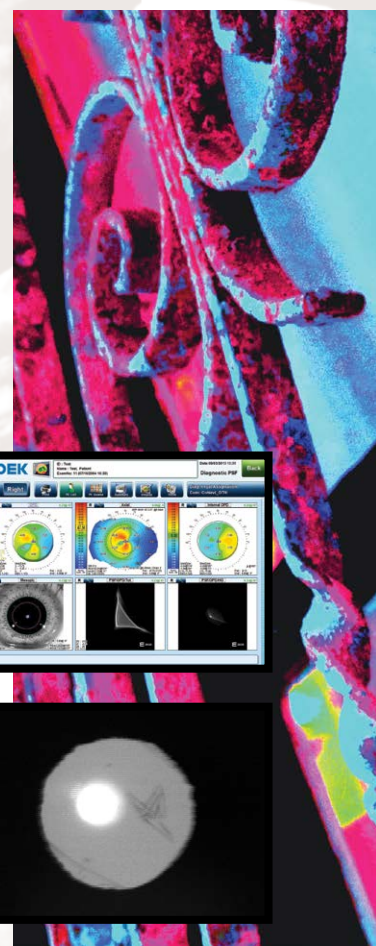
Dr. Patterson: A recent article¹ indicates that 0.32 μ of corneal coma is the maximum allowed without complications or the need to explant a multifocal lens. Do you measure corneal coma for multifocal IOL selection?

Dr. Jackson: Marc Michelson, MD, conducted a very large study and found that patients with high amounts of coma and high total higher-order aberrations were unhappy after surgery.³ With the data we need up front, we're able to prevent postoperative surprises for our patients. We can choose the right lens for each patient, whether we're looking at high angle kappa, coma, irregular astigmatism or spherical aberration. We can open up the premium IOL channel in our practices and feel comfortable that we'll be able to provide an excellent outcome because as the lens technology has improved, so has our ability to predict better outcomes and happier patients.

Dr. Tyson: I agree. With a real financial crunch, if you're not in the premium IOL channel, your practice won't survive. I've aligned myself with this technology to be more powerful than the ophthalmologist next door. It finally gives us the comfort level we need to be able to successfully implement premium lenses. ■

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"As a profession, we're being audited more frequently, particularly for YAG capsulotomies. We need proof that we're performing YAG capsulotomies on legitimate patients....It's nice to have the retroillumination image in the chart to back us up during an audit."

— Farrell "Toby" Tyson, MD

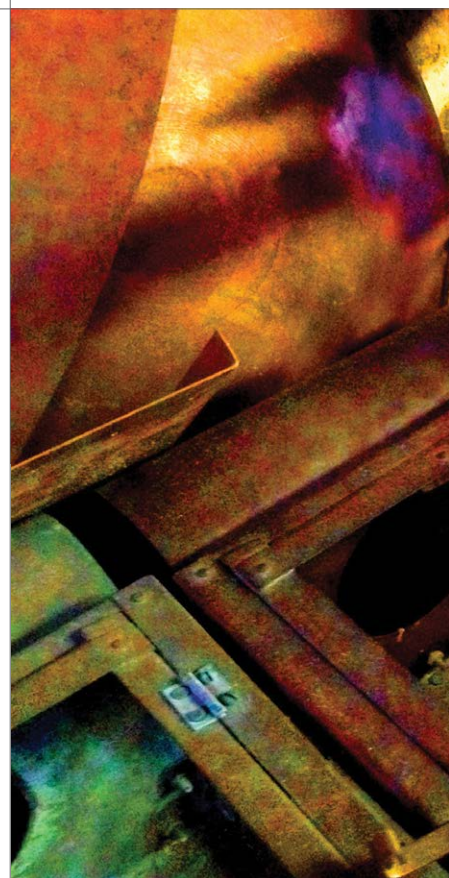




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