

XFRACTIONSM

Wavefront Optimized Refra^Xion

Learn how linking autorefractometry and aberrometry enhances clinical understanding while improving patient flow and outcomes.

INSIDE:

- Explore the development of wavefront optimized refraction
- Get an inside look at four practices that have benefited from XFRACTION

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Wavefront Optimized RefraXion

By linking autorefraction with wavefront aberrometry, Marco XFRACTIONSM explores an exciting relationship.

By Louis J. Catania, OD, FAAO, DSc

In order to optimize refraction by combining it with higher-order aberration data, Marco has developed what it calls the XFRACTION process. In my practice, where we've utilized EPIC workstations and TRS-5100 digital refractors for 10 years, as well as Marco's OPD-Scan series of wavefront aberrometers for about 8 years, we helped develop and utilize this process.

The idea of tying refraction with aberrometry began to evolve in the course of research several years ago when we began to see a potential relationship between vision and refraction. To explore this potential relationship, Marco decided to commission software that would evaluate patient data and present it to doctors in a practical way. I worked with the developers for 2 years as an advisor, helping them understand the concept of what we wanted to create. The end result is the XFRACTION process — a much-needed, effective, and practical clinical tool.

Clinical Benefits

At a glance, it's easy to see how the XFRACTION process delivers a great deal of data, producing more than 20 measurements of the visual system every time you press a button on the joystick. The information is available if you need it during the exam, allowing you to simply select the measurements that are most important to each case.

For starters, we gain more valuable information from the system's refraction than can be obtained from a routine refraction. Not only is the XFRACTION process very accurate and comprehensive, but it also

incorporates pupillometry. We now understand the intimate relationship between the size of the pupil and the patient's vision, and with XFRACTION, we have a more complete picture by controlling pupil size for both higher- and lower-order values.

The integration of wavefront aberrometry allows us to understand the visual phenomena experienced by our patients. In addition to what I see in the slit lamp and indirect ophthalmoscope related to vision, I also have access to refractive data I've never had before during an exam.

This helps in very practical, routine ways. For example, when a patient reports experiencing night vision problems, I can look at the fourth-order aberrations and analyze the problem. If a patient experiences doubling and halos, I look at third-order comas. For patients who don't refract to 20/20, I can find out if it's a functional problem or pathology. The data is all there.

For routine full exams, I use XFRACTION's basic components: digital refraction, wavefront refraction, pupil size and total higher-order aberrations. I choose whether to use the remaining data gathered by the system based on each patient's clinical findings. XFRACTION may also provide advantages in some cases when patients present with medical complaints. For example, XFRACTION can help me determine if patients have severe visual effects from their condition, or even mild ones from dry eye or other ocular surface disease.

We're also learning a great deal about patients' "just noticeable difference" (JND) from aberrometry. This is something we've never really applied in refraction

because we didn't have the higher-order data to put it together. Now we can determine this because we're no longer relying on the "Which is better, 1 or 2?" method. We know that the best eyes still won't discriminate between less than 0.1 diopters; in fact, 20/20 eyes can't discern less than 0.2 diopters. Instead of relying on patients' perceptions, we can now measure the JND scientifically.

Business Advantages

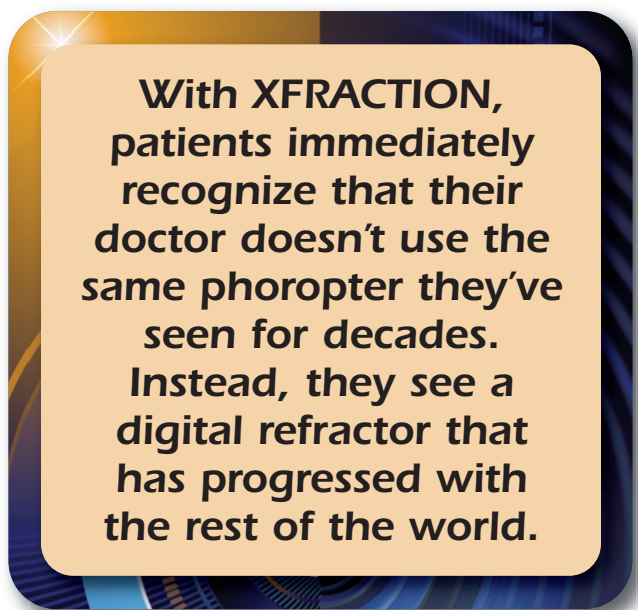
Every new technology we purchase has to not only enhance clinical outcomes, but also do it in a way that has no negative effect on our efficiency. The speed of the XFRACTION process actually increases efficiency while providing other business advantages.

Efficiency is a key to any successful practice. Most significantly, routine processes must be as efficient as possible to move patients through their visits. The XFRACTION system gives us a rapid, accurate refraction, providing the efficiency we need for business value without compromising the quality and accuracy

revenues. The choice of how to reinvest time — our most valuable commodity — is yours.

XFRACTION also offers different business advantages based on whom you choose to operate the system. If you feel comfortable delegating this task to your technicians, it saves you time and increases overall efficiency. If you choose to do the testing yourself, then you're still using less time than with traditional manual refraction. The extra time can also be spent providing optical advice that has a great deal more weight coming from a doctor than coming from the optical area of your practice. This converts into a business value, as patients are potentially more likely to purchase the vision correction options that their doctor recommends.

Finally, because XFRACTION enables us to see and measure a patient's JND, correction is more accurate. Fewer patients return with complaints, and if they do return, we are better equipped to help them, based on aberrometry and XFRACTION information. Higher patient retention and referral would also be a logical expectation.



Patient Rewards

We see the value of XFRACTION in terms of clinical and business results, but what does the patient see? Happily, XFRACTION is a technology that shows patients they're getting something better, rather than relying on us to convince them.

With XFRACTION, patients immediately recognize that their doctor doesn't use the same phoropter they've seen for decades. Instead, they see a digital refractor that has progressed with the rest of the world.

I used to think that the technology might be more of a potential risk or disadvantage with the geriatric population. Perhaps they'd want their refraction done the same way it had been for the last 60 years. Instead, those patients are very impressed, and that "wow factor" is often expressed literally with a "Wow!" The vast majority of patients think it's great. And of course, younger patients appreciate a fresh approach as well.

The psychological effects of seeing new technology in the practice — particularly boosted confidence in the doctor — are a plus for new technology in general and for refraction in particular because that's the cornerstone of our work.

What's more, the process patients go through with this new hardware isn't a dramatic shift. If we con-

of refractive readings. In addition, Marco's XFRACTION devices all work effortlessly with practice management software and electronic health records, saving data entry time and reducing transcription errors.

Ultimately, these efficiencies give doctors more time, which they can spend with patients or fill with more medical or refractive patients to increase

fronted them with something out of Star Trek, they might feel intimidated, but the EPIC, OPD-Scan and TRS digital refractors still have them sitting and looking through a device shaped like a refractor. It's a seamless transition for them. I think patients also feel more comfortable with the automated process that gets them out from under the "Which is better, 1 or 2?" process. The XFRACTION process of digital autorefraction optimized by wavefront aberrometry, whether through the EPIC workstation or a TRS refractor in a standard refracting lane, generates real patient reassurance.

The system also has value for patients as a teaching tool — a way to show them their eye problems. For example, I can put a Zernike map on the screen, or print a hard copy, and explain that we want to see a nice, smooth color pattern. If their map appears half red and half blue, I explain that this indicates two focuses coming through the pupil and causing the problem. Or I might show patients their spherical aberrations with rings of blue and yellow to explain night vision halos and other problems. Point spread function (PSF) can also help them see the vision pattern they experience when looking at objects such as streetlights and car headlights.

Finally, instead of spending all of that time with patients behind the phoropter spinning dials, we can spend more time face to face, talking with patients, educating them and consulting on needed services. This is a much better patient education process, one that helps build comfort and trust between patient and doctor.

Proven, Essential Technology

Eight years ago, I tried to get doctors to understand the science of wavefront and optimizing refraction by combining digital refraction with higher-order aberration data. Then, I tried to apply it clinically to show the relevance of the data, yet all I could show was its "potential" relevance. Now we're realizing that potential. Doctors don't need me to show the real relevance of the data because they can now see how it works. Now my discussions with colleagues often turn to the subject of practice efficiency and continued growth — factors that I think make the technology indispensable, given the greater challenges our profession is experiencing.

This is the practical side of XFRACTION. The digital refraction component alone is much more efficient while actually enhancing quality. That means more time and potential revenue for you. The fact that patients will choose your practice with the latest technology over the practice down the street means continued growth. You'll

be better served having the technological edge NOW than if you wait (until you notice patients leaving). This change is especially important in refraction. As with other technologies that are becoming highly visible cornerstones of your practice, if you're not functioning at the top level of care with these instruments, then you're losing ground in optometry.

Instead of spending all of that time with patients behind the phoropter spinning dials, we can spend more time face to face, talking with patients, educating them and consulting on needed services.

These new technologies are expensive — there's no way around that. But they offer significant ROI through time savings per patient, fewer lens remakes, optical revenue gains, patient retention and competitive advantages to name a few. The most important thing to understand is that you're not buying a box. You're buying dynamic software and a partnership with a company. Any equipment provider you choose should work to help you understand the application, offer sophisticated training for you and your technicians and invite your feedback for regular software enhancements. Your investment will pay for itself financially, and it will give you a seat at the table of colleagues working at the highest level and even contributing to advances in technology. ■



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A Look Inside Four XFRACTIONSM Practices

Four optometrists from across the country share their perspectives on this marriage of autorefractometry and aberrometry.

Wavefront technology has enabled eyecare practitioners to go beyond traditional refraction and measure patient's higher-order aberrations. The combination of wavefront aberrometry and refraction can deliver a picture of the complete visual system. In its exploration of this relationship, MARCO has developed software to integrate the data from its OPD-Scan III aberrometer and the TRS-5100 autorefractor. The system, called XFRACTION, enables doctors to achieve what's called "wavefront-optimized refraction."

The XFRACTION software lays out more than 20 diagnostic measures harvested by the devices. In less than 1 minute, users know which patients need full refraction for 20/20 vision and which patients need only basic refinement. Overall, the system saves about 5 to 7 minutes per wavefront patient, compared to manual refraction. Most importantly, patient outcomes include better prescriptions and treatment for visual complaints that often didn't have solutions in the past.

Here, four accomplished optometrists from around the country, all XFRACTION process users, share their perspectives on the system, including how they use the technology in their practices, the clinical results they've seen, how the process directly affects revenue and what patients think of XFRACTION.

Michael Johnson, OD, Eagle Vision Eye Care Optometric Group, Sacramento, Calif.: "My staff typically performs the pretesting. This includes screening fields, OPD and lensometry. The OPD and lensometry readings are loaded into the TRS, and from there, I can refine the final prescriptions within minutes — sometimes less. Additionally, the TRS makes binocular vision and near-point testing a breeze."



Ryan Rosemore, OD, Rosemore Eye Care, Plano, Texas: "I run the scan myself, so I get a good feel for the validity of the measurements. I want to see if patients are looking straight ahead and following instructions, as well as if they're blinking, squinting or showing light sensitivity. It's a very fast and simple scan that gives me a great deal of information."



"With two doctors, we keep two lanes going with two automated refractors. We have a manual phoropter for slow prism movement with kids or vision therapy patients, but nearly all of our patients undergo refraction on the automated refraction system."

How Have You Incorporated XFRACTION into Your Practice?

New technologies usually sound good, but you don't know how they'll work in your practice until you take delivery. The goal is always ease of use and a short learning curve. The rest is up to you. Do you use the device yourself or delegate the work to technicians? Do you use it on all patients or a select few? After a few months, the new device will be integrated into your exam lane, your work patterns and electronic health records (EHRs). And you'll have a good idea of all of its functions and which ones provide the most assistance.

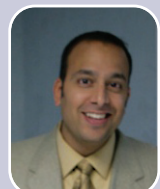
Chris Deibert, OD, Valley Eye Clinic, Luray, Va.: "I use the XFRACTION system on all of my patients. The OPD-Scan is very fast and easy for technicians to operate, so they do the scan and download it into the TRS-5100 for me."



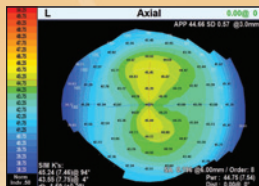
"This device has really changed the way I perform refractions. It would be hard to go back to using a regular phoropter now. While patients are behind the eyepiece, I'm changing the lenses from a control panel a few feet away. It's more accurate than any other autorefractor I've used."

"It generates a great deal of information and displays it in different tiles I can arrange for fast, easy analysis. I can customize the corneal topography, internal OPD, point spread function, total and higher-order wavefront, pupillometry and refractive maps in a way that works best for my practice. Based on whether the system displays autorefractometry alone or with wavefront refraction, I rapidly know if the patient needs a straightforward new prescription or additional correction."

Steven Chander, OD, Primary Eye Care Associates, Chicago: "MARCO helped me implement a new workflow that quickly provided a good ROI for the technology. We discussed the "one-point," or "one-touch" examination. We see patients from start to finish, including dilation, either sending them to the optical area after the exam or letting them choose frames as a first step. It's a brilliant process. Our workflow is very smooth and efficient."



How Does XFRACTION Improve Your Diagnostic Capabilities?



There's no room in your practice for a new device that doesn't offer a significant improvement in some key area, whether it's efficiency, record-keeping or clinical quality. For example, getting more data doesn't necessarily represent an improvement unless you can actually do something with the data in a practical and timely way. XFRACTION delivers data in a way that provides wavefront optimized refraction. Could that help your patients? And does it offer any other advantages?

WF CANDIDATE				
HOA [μm]:	@4.00mm / Order = 4	L		
T.Sph	T.Coma	T.Tre	HO	
Total:	0.020	0.040	0.025	0.059
Cornea:	0.061	0.108	0.073	0.155
Internal:	0.041	0.085	0.091	0.156
Refraction: VD = 13.75mm				
	Sph	Cyl	Axis	RMS
WF@4.00	+1.00	-0.50	105	0.07D
WF@5.42	+0.75	-0.50	111	0.19D
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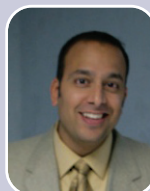
Chris Deibert, OD: "XFRACTION has helped to make patient assessments more accurate and efficient overall, and the system is especially useful for cataract and LASIK co-managing practices. To help select an IOL, I use many of the digital measurements, such as higher-order aberrations, front surface topography and corneal asphericity. I can tell how much of a patient's astigmatism is in the cornea versus the lens and determine which IOL will best neutralize a patient's astigmatism for night driving. And unlike other wavefront refractions tied to specific lenses, the OPD-Scan III isn't tied to any optical product.



"The system does an exceptional job of evaluating day and night vision as well. The TRS-5100 performs one refraction in daylight conditions and another refraction with the pupil dilated for nighttime conditions. In about night 5% to 10% of my patients, I find that the day and night prescriptions are significantly different. That doesn't always require a change in correction — some patients are better off sticking with a single pair of eyeglasses. But about 5% of patients can benefit from having separate pairs of eyeglasses for day and night. I'm not following a general rule of thumb to add minus for nighttime — I'm getting each patients' exact nighttime prescription and addressing their frustrations.

"For day and night correction, old and new prescriptions, or even just to compare '1 or 2,' the TRS-5100's split prism is an interesting feature. Patients can see both lenses side by side, rather than one after the other. Because the patient has to be centered in the aperture for this to work, I only use it occasionally, but it's the first time I've been able to offer patients a head-to-head comparison to give them a clear choice or help them understand my recommendation."

Steven Chander, OD: "Day-versus-night vision, including night vision problems, are made very clear. In a very short time, I get highly accurate refraction and topography to guide vision correction. It's a very fast process, but also extremely accurate."



Ryan Rosemore, OD: "The refraction itself is extraordinarily accurate. I rarely need to make any additional refinements to the automated measurements with wavefront patients.



"I've gotten excellent topographic results as well. The topography and retro illumination help me evaluate patients with cataracts. It's also easy to see pellucid marginal degeneration or keratoconus. And when a patient comes to me after getting a bad fit for RGP lenses, I send the topography straight to the lab. I've had good results fitting those patients."

Michael Johnson, OD: "Who wouldn't want to provide their patients a better, faster, more accurate refractive exam?"



"XFRACTION differentiates me from the competition because it helps me better understand the patient's refractive system. This is advantageous for all patients, especially those with vision problems that would have proved difficult to diagnose in the past.

"It's frustrating not only for the patient, but also for me as a doctor when a seemingly healthy individual with no ocular pathology is unable to see 20/20 or can see 20/20, but still isn't satisfied with the "quality" of his vision. With a traditional autorefractor, you typically get K-readings and an average refractive reading. With the OPD, you virtually follow the light through the optical path of the eye. Patients are very impressed and sometimes relieved when you can show them why their refractive system is producing a sub-par image.

"Often, these patients have worse vision at night. They benefit from a night vision assessment, and this often translates into needed second pair sales."

Does XFRACTION Increase Your Revenues?



OPD-Scan III

There are only two ways to increase revenues: See more patients or earn more for each patient visit. Clearly, seeing more patients means spending less time per patient. Earning more per visit can mean increasing optical revenues, reducing remakes or a host of other strategies. XFRACTION is designed for speed and accuracy. How does that translate into revenue in optometric practices?



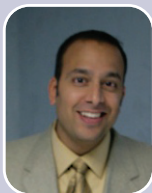
TRS-5100

Chris Deibert, OD: "I've seen some revenue increase in the optical area from day and night prescriptions, but the real financial benefit is that XFRACTION makes things more accurate and efficient overall. It cuts down on chair time. I can complete a refraction in a couple of minutes, and I can perform some binocular vision tests more quickly than I could with the manual phoropter as well."



"What that means to your practice depends on your volume. We're fairly busy in my practice, completing 15 to 18 full exams per day, as well as another 15 to 20 medical visits for glaucoma, cataract post-ops, and acute problems. With more than 30 total patient encounters per day in three exam rooms, you need ways to be as efficient as possible while maintaining (or increasing) the level of accuracy and patient care. I may eventually delegate autorefract to my technicians to boost our efficiency even more."

Steven Chander, OD: "I saw how the OPD-Scan III and TRS 5100 refraction system would pay for themselves by facilitating the sales of multiple eyewear, as well as boosting efficiency to see at least 2.5 more patients a day. Since then, we further enhanced our workflow by adopting the EPIC system — now adding four more patients a day."



Ryan Rosemore, OD: "Speed is the advantage. Being able to trust the cylinder measurement cuts my time in half. In using XFRACTION for 4 months, I've had one prescription rejection on the basis of cylinder, compared to about one per month when I was refracting manually."



"The system also links seamlessly with all of our devices and our practice management software, which saves time and results in fewer errors during information transfer."

Michael Johnson, OD: "The OPD takes less than a minute to complete a reading, and the TRS is quiet and fast. The combination helps to decrease testing time by 5 to 10 minutes. Since we incorporated the OPD with the TRS, we've been able to see at least four more patients a day, sometimes more. This translates into more optical and exam revenue without increasing fixed overhead."



"Obviously, seeing four more patients per day increases revenues significantly. A smaller increase in optical revenues is made possible by the ability of XFRACTION to provide day and night prescriptions. A portion of those patients with significantly different prescriptions choose to get two pairs of eyeglasses."

"The system also fulfills one of my major goals for purchasing it in the first place: EHR compatibility. I've been using the OPD and the TRS since I moved my practice 4 years ago. Up until that time, I'd been using a traditional auto-refractor, phoropter and paper records for my refractive needs. My previous method was adequate, but looked and felt outdated. Also, with the looming threat of mandatory EHR, I decided it was time to make a change. All of the XFRACTION system data imports seamlessly into my EHR, which has eliminated transcription errors and resulted in fewer remakes due to careless errors."

"Finally, I consider XFRACTION to be good for my bottom line because its excellent ergonomics keep me working comfortably. After years of using my traditional phoropter, I developed tendonitis in the elbow and forearm. I sought treatment from a hand specialist and went through physical therapy, massage, acupuncture and cortisone shots. The pain continued for several years. Once I started using the TRS, the pain went away."



What Do Your Patients Think of XFRAC-TION?

Any practice consultant will tell you to look at your practice from the patient's perspective. It's hard to know what kind of response your gray carpet may elicit, but technology is another matter.



Ryan Rosemore, OD: "When I looked into XFRAC-TION, I talked to people at larger practices. They told me that a big selling point is that even if you're not so busy that you need to push patients through faster, patients like to see a digital system because that's how everything works now. It looks more 'normal' to see an automated electronic device than to see something that hasn't changed in decades. So even if my schedule wasn't full yet, I knew it would still make a difference in the patient experience. Additionally, my patients have never seen anything like it, which shows me that other offices aren't doing this yet."



"The potential for education is great, too. I can show patients their cataracts or the aberrations causing their night vision problems. That's helped them understand what's going on with their eyes. Looking at the Snellen charts with and without glasses makes sense to them as well. They're not used to seeing the problem and feeling like a part of the exam, but now it's very easy to explain problems to them and have more of a partnership experience."

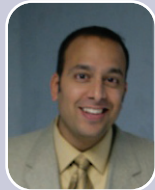
Michael Johnson, OD: "Patients are constantly commenting on my office being technologically advanced. XFRAC-TION increases efficiency, accuracy and speed, resulting in better patient flow and a better patient experience. Patients actually have fun with the process because it's so much quicker. And because the testing time is decreased, I can spend more time with them discussing their exam findings and optical needs."



Chris Deibert, OD: "Patients are impressed when they see the autorefractor. They've never seen that before. They're very used to the 'Which is better, 1 or 2?' question and they dislike it."



Steven Chander, OD: "From my patients' perspective, I wanted an automated refraction technology to deliver three things: 1) a marriage of accuracy with a patient 'wow' factor," 2) something easy for patients to understand, and 3) the ability to demonstrate how an individual will benefit from multiple eyewear or high-end lens and coating technologies. The OPD-Scan III and TRS 5100 deliver all three."



Much in Common

The words of four doctors from different practices show that many common threads of experience bind together XFRAC-TION's partnering of aberrometry and autorefraction. With time to use and integrate the technology, all four doctors are using it for enhanced, wavefront-optimized refraction. Slipping easily into their work patterns and data flows, XFRAC-TION has also helped the doctors identify night vision problems and co-manage surgery.

XFRAC-TION's accuracy and comprehensive data collection are delivered at a very high speed, saving time in all four practices. Benefits include gaining time to see more patients, reducing remakes and increasing optical revenues through day and night correction. What's more, their patients have been impressed with the autorefractor and have gained from use of XFRAC-TION as a teaching tool. All in all, the marriage of autorefraction and aberrometry appears to be a very important step forward for optometry. ■

OPTOMETRIC Management

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