

Vision Correction Goes Online

As patients use the web for refraction and dispensing services, ophthalmologists must determine for themselves whether this is a welcome technology or bad medicine.

By Stephen Barlas, Contributing Writer

A NEW WORLD OF VISION TESTING and eyewear sales is dawning now that refractions and prescription fulfillment are being offered online. Some consumers no longer need to visit an ophthalmologist or optometrist in person for prescriptions and—if needed—contacts or glasses from an affiliated optical shop. They can do both at home via their computer, and they can do it cost-effectively.

Although these new approaches may raise concerns among ophthalmologists, they also may provide opportunities, according to some observers.

Remote Refraction

New players are entering the remote refraction arena, all with different approaches (see “Telerefraction Services,” page 43). At this time, however, Opternative is perhaps the most widespread, with the capability of issuing new prescriptions directly to U.S. consumers in 39 states via its own website. Its technology is also used by 1-800 Contacts.

How it works. A consumer takes the Opternative vision test using a computer and smartphone while being guided by audio instructions. Opternative uses ophthalmologists who practice in the states in which it operates—and in which the patient resides—to read test results, review the relevant medical history, and, within 24 hours, provide a prescription or other clinical guidance.

Opternative’s service is not right for everybody, and it attempts to screen out potential patients

who are not candidates for the test. To receive a prescription from Opternative, consumers must be 18 to 50 years old and within a prescription range of -10.00 and $+3.50$ in spherical strength, $+0.25$ and $+3.00$ in cylinder power, and $+0.25$ and $+4.00$ in add power. In most cases, a customer must present a previous prescription, regardless of the prescription’s age. Prescriptions for first-time contact lens wearers are not provided by the site.

Refraction Services: The Upside

Robert B. Dinn, MD, co-owner of a practice in Indiana with 3 offices, each with an optical shop, said that he is impressed with the potential of the telemedicine refractions that are offered by companies such as Opternative and myVisionPod.

Convenience and cost. One obvious benefit of these services is the convenience that they offer, said Dr. Dinn. For example, Opternative boasts an online test time of 30 minutes or less, and the charge for a glasses or contacts prescription is \$50 (\$60 for both).

Flagging for in-person exams. If Opternative’s online screening questions hint that a consumer is at risk for vision issues that might require a comprehensive exam, that person is not offered a prescription. Instead the patient is urged to see an eye doctor. Dr. Dinn noted that often patients might assume that they only need glasses, and it can be helpful when the online exam pulls up a red flag, letting them know that an in-person eye exam may be beneficial.

Technology of the future. Dr. Dinn not only believes that remote screenings and even remote eye exams may be the wave of the future but also that these developments may not be a negative for ophthalmology practices and patients.

For example, Dr. Dinn said, “If the quality and quantity of remote eye technology improves, I may not have to spend so much time doing routine work. For instance, telemedicine for fundus photography has already shown great potential for screening for diabetic retinopathy.¹ Further, many technicians can be taught to accurately check intraocular pressure, and the technology in optical coherence tomography could be adapted for telemedicine in remote locations to screen for optic nerve and macular diseases, such as glaucoma and age-related macular degeneration.”

Michael S. Jacobs, MD, owner of Athens Eye Associates in Watkinsville, Georgia, agreed. “Organized ophthalmology should not be quick to say ‘no’ to Opternative,” he said. “There will be more and more applications that come from web-based diagnostics, and we must use caution in dismissing new programs before we have had the opportunity to fully investigate their potential to help diagnose and treat our patients.”

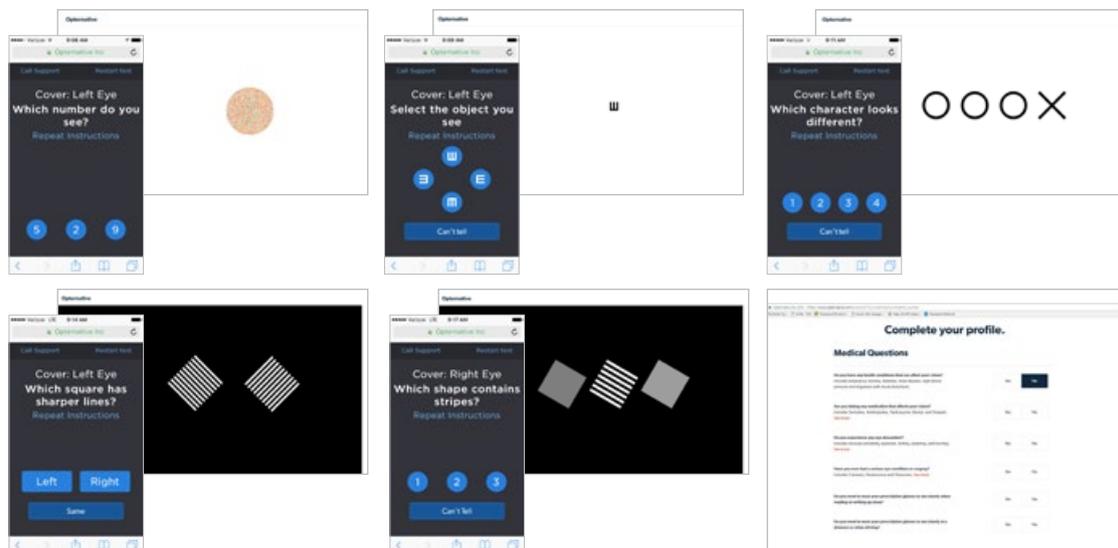
Dr. Jacobs’ thoughts are in line with an Academy statement from 2014 titled *Innovative Technologies in Diagnosing Eye Diseases and Conditions*.² It says new technologies (none of which are men-

tioned specifically) “could be positive in enhancing patient understanding and management of their condition, making diagnostic tools available in more remote settings, permitting remote diagnosis and interpretation, and reducing health care visits and costs.” The statement recommends that ophthalmologists evaluate new technologies as they would any other modality and make their own decisions on whether to use them or recommend them.

David B. Glasser, MD, at Johns Hopkins and Associate Secretary of the Academy Health Policy Committee, said that the committee has had several discussions during the past few years about whether the 2014 statement should be revised. However, committee members decided against doing so because “the general nature of the statement still fits.”

Dr. Glasser noted that—in contrast with the Academy—the American Optometric Association (AOA) is currently battling at the state level to keep Opternative from offering its refraction services. Resulting legislation in 6 states limits both MDs and ODs from using these types of technologies. “Although some ophthalmologists might be concerned that Opternative and services like it could result in the loss of some optical business, it is never a good move to agree to limiting a medical license,” he said. (For more, see “AOA’s Battles,” page 44.)

Opternative: Screening Guided by written and audio instructions, the patient uses a smartphone and onscreen program to take the Opternative refractive exam. From a set distance, the patient views images on the computer screen and answers questions about the images on the phone. The Opternative exam concludes with a list of medical questions. Within 24 hours of completing the vision exam, most patients will receive a prescription, while others will be encouraged to get a comprehensive eye examination.



Accuracy and Completeness

Accuracy. As of yet, no evidence in the peer-reviewed literature compares the accuracy of the Opternative vision measurements with those taken in an ophthalmologist's or optometrist's office. However, the company conducted a side-by-side clinical trial of 30 patients at the Chippewa Valley Eye Clinic in Eau Claire, Wisconsin. The study showed that the Opternative vision test is comparable to in-office phoropter-based systems.³

And on Aug. 5, 2016, the ABC television show "Good Morning America" aired a segment in which Lisa Park, MD, then an associate professor of ophthalmology at the NYU Langone Medical Center, compared 8 Opternative vision tests with her own refractions. Six of the 8 patients received prescriptions from Opternative, while 2 were instead encouraged to see an eye doctor.

When Dr. Park performed her own refractions on the 6 patients who got prescriptions, she found that the Opternative prescriptions were either the same as her own results or not significantly different. She did note that 1 of the 6 patients presented with mildly elevated intraocular pressure, which

the Opternative refraction exam does not test for.⁴

Completeness. Beyond unanswered questions about the accuracy of the Opternative measurements, there is also the important issue of its completeness. "While a refraction may be done remotely at a lower cost than a complete eye exam, it cannot replace a complete exam," said Dr. Glasser. "Refraction is unable to detect early stage disease, which is one of the key goals of routine and screening eye examinations. However, remote refraction might play a role in any number of care delivery and payment models that can help to ensure that comprehensive eye evaluations do not fall by the wayside."

Opternative's website makes it clear in several places that it is not offering a comprehensive eye exam, though it does ask online screening questions to help discern whether a particular patient might be in need of a comprehensive eye exam. If that proves to be the case, the patient is urged to see an eye doctor and no prescription is provided.

A good number of people taking the test are referred to an in-person eye care professional via a list of local eye doctors. Opternative currently

Telerefractive Services

Several companies are making a foray into the burgeoning online and remote refraction markets, including the following:

Company	Vision Test	Device(s) Needed	Rx
EyeNetra www.eyenetra.com	Eyeglass	Smartphone with proprietary headset for mobile use under the supervision of an eye care professional.	Issues new prescription/ confirms current prescription.
myVisionPod www.myvisionpod.com	Eyeglass	Proprietary technology installed at a remote location (e.g., pharmacy).	Issues new prescription/ confirms current prescription.
Opternative www.opternative.com	Eyeglass and contact lens	Smartphone and computer.	Issues new prescription/ confirms current prescription.
Simple Contacts www.simplecontacts.com	Contact lens	Smartphone and computer.	Confirms current prescription.
Smart Vision Labs www.smartvisionlabs.com	Eyeglass and contact lens	Proprietary technology for use in office/clinic.	Issues new prescription/ confirms current prescription.
Vmax Perfectus www.vmaxvision.com/perfectus	Eyeglass and contact lens	Proprietary technology for use in office/clinic.	Issues new prescription/ confirms current prescription.
Warby Parker www.warbyparker.com/prescription-check-app	Eyeglass	Smartphone and computer.	Confirms current prescription.

doesn't have a process for tracking whether those people ever receive an eye exam, which the company will address soon with a follow-up program, said Bruce J. Goldstick, MD, president of Optimized Eye Care, the Opternative affiliate in Illinois that manages the physicians who review patient vision tests, and in practice in Skokie, Illinois.

It is also Opternative policy not to provide refractions after 4 years in a row without proof of a comprehensive eye exam. What's more, the site encourages customers to have a comprehensive eye exam every 2 years. This recommendation of biennial exams for Opternative's 18- to 50-year-old patient population falls in line with the 2015 Academy Clinical Statement, *Frequency of Ocular Examinations*, which says, "Adults with no signs or risk factors for eye disease should receive a baseline comprehensive eye evaluation at age 40.

AOA's Battles

The American Optometric Association (AOA) is fighting online refraction technology at the federal and state levels.

Federal. In April 2016, the AOA filed a complaint with the FDA against Opternative for marketing its technology without prior FDA review of the safety, efficacy, and promotional claims of Opternative's technology—or of any other similar device that generates lens prescriptions.¹

The FDA has not yet issued a formal statement on these devices.

State. At the state level, the AOA has had some success in limiting patient and MD access to new refractive technology. For example, the Michigan Department of Licensing and Regulatory Affairs (LARA) issued a cease and desist order in February 2016 mandating that Opternative immediately halt actions violating the state's public health code, including:

- Issuing prescriptions for contacts and/or spectacles to patients without a Michigan-licensed doctor first performing a complete ocular health assessment—one that goes beyond simply an objective refractive test.
- Issuing prescriptions for contacts and/or spectacles to patients based solely upon a test that relies on objective refractive data generated by an autorefractor or other automated testing device.

In addition to Michigan, OD bills have banned online refraction technology in 5 other states: Georgia, Indiana, Maine, Michigan, Nebraska, and (pending a legal challenge) South

Individuals without risk factors aged 40 to 54 should be examined by an ophthalmologist every 2 to 4 years.²⁵

Patient awareness. It's important that patients be aware of the role of a comprehensive eye exam in their health, said Dr. Dinn and Rohit Varma, MD, MPH, at the University of Southern California. "The big thing to worry about is catching early signs of disease, like glaucoma, where irreversible, preventable, and treatable damage can be done," said Dr. Dinn.

Obviously, glaucoma is only one of several conditions that can be treated effectively if caught early. The same is true for cataracts, macular degeneration, and diabetic retinopathy. As Dr. Varma noted, "Those are the 4 leading causes of vision



- Legislation Enacted (GA, IN, ME, MI, NE)
- Legislation Enacted Pending Legal Challenge (SC)
- Legislation Amended to Permit MD Use (VA, WV, WY)
- Legislation Failed (FL, MN, MT, NM, NV)
- Legislation Pending (CT, IL, RI, WA)
- OD Board Regs Prohibit OD Use; Regs Not Applicable to MDs (AL)

Carolina. And legislation is pending in 4 more states: Connecticut, Illinois, Rhode Island, and Washington.

Academy stands up for MDs. The Academy has been fighting back against this restriction of the overall plenary licensure of medical and osteopathic doctors. The Academy backs ophthalmologists' right to evaluate new technology to determine whether it is in the best interests of their patients. "Medicine, not optometry, should decide whether and how MDs use new technologies," said Dr. Glasser. In Florida, Minnesota, Montana, New Mexico, and Nevada, OD legislative efforts have failed. And the Academy has succeeded in exempting MDs from the new law in Virginia, West Virginia, and Wyoming, such that it only applies to ODs.

1 <http://static.politico.com/5f/53/d9d8aa8949e1a73bdbe6384ac010/american-optometric-association-letter-to-fda-on-opternative.pdf>.



FULL SERVICE. The Loden optical shops will provide pupillary distance to patients at no cost, and staff help patients understand the importance of fit.

loss. All are painless and insidious conditions. They progress slowly, and you can't really tell you have the condition until it is too late."

Online Dispensaries

Of course, millions of Americans continue to visit their ophthalmologist's office for a comprehensive eye exam and a prescription. Some patients take those prescriptions and run . . . straight to their computers or to Walmart (or a similar store) to buy glasses—bypassing the optical offerings of the ophthalmologist or optometrist.

Competition—not a concern. When it comes to saving money on glasses, said Dr. Dinn, "retailers such as Walmart and other chains have found a space for themselves in the market by making available inexpensive, low-end glasses in a wide variety of styles."

Online retailers are more likely to be competing with these chains than with ophthalmologist's optical shops, said Dr. Dinn, adding that ophthalmologists typically cater to a different patient population than online retailers. According to Dr. Dinn, "many of our patients are elderly or have complex prescriptions—prisms, for example—that are not likely to be offered by online retailers."

Dr. Dinn is not concerned about potential loss of revenue due to online competition. "We offer optical as a convenience and as a way to offer truly comprehensive care—not as a way to make money." Although retailers such as glasses.com offer "virtual try-on," Dr. Dinn does not think the online retailers will be able to compete with the high-end products or individualized care and fitting offered at optical shops owned by many independent ophthalmologists and optometrists.

Competition—another perspective. When MD-based optical shops have a strong profit motive, how do they perceive online competitors?

"We do not really see them as direct compet-

itors because we pride ourselves on delivering high-quality care from well-trained opticians and providing exceptional product lines," said Carolyn Salvato, at Loden Vision Centers, which has 4 optical clinics adjoining MD/OD offices in Tennessee. Her shops do offer a value package program for patients who are working within a limited budget. "We are very aware that patients can purchase glasses online for incredibly low prices, but all of our staff, including the physicians, realize the importance of frame the fit and lens measurements and discuss this with patients when necessary."

As for the variety of styles offered online, she said, "There will always be a wide array of options for patients to choose from. However, we have found that if you provide outstanding customer service from the beginning to the end of every encounter, your capture rate increases significantly," she said.

Helping patients with problem lenses. Issues may arise when a patient takes his or her prescription and buys glasses online or from a brick-and-mortar vendor, and the new lenses do not properly correct the refractive error. Dr. Dinn said, "In that instance, we can spend a lot of time troubleshooting, and from that regard it is a little frustrating." Moreover, for the patient, the wrong glasses purchased online can result in added costs.

Pupillary distance. The potential for an online sale to go awry arises even when a consumer has a current prescription from his or her MD or OD. That prescription typically does not include the pupillary distance (PD). For example, www.eyeweb.com has a buyer download a ruler from its website. It then instructs the person to place the ruler over the bridge of his or her nose and take a photo with a cell phone. "While online retailers offer options for measuring PD, they are nowhere near as accurate as the pupillometer available in vision clinics," explained Ms. Salvato.

Many customers may feel uncomfortable about going back to their ophthalmologist's optical shop and asking for the PD measurement—out of concern that the practice might charge for the service or might not provide PD unless the customer buys glasses there. Ms. Salvato said it is rare that a Loden customer comes back to the optical shop to get his or her PD so that he or she can buy glasses or contacts online, although Loden will provide the PD at no cost. "I have trained the staff that this is an educational opportunity to emphasize to the customer the importance of fit," she explained.

Contacts. Although getting an online prescription for glasses may be a trend of the future, Dr. Dinn emphatically said he is against online prescriptions for contact lenses. "These patients need a slit-lamp examination to determine if the

eyes are healthy enough for the contact lenses and to make sure the contact lenses fit correctly. Contact lens patients can and do get permanent, blinding conditions from their contact lenses, and there are times that I refuse to prescribe contact lenses based on physical findings.” Additionally, an in-person visit allows the eye care professional to review wearing habits with the patient, he said.

A different set of potential administrative problems can arise when a customer goes to 1-800 Contacts, the biggest player in the field, or another online retailer for contacts. The 2004 Fairness to Contact Lens Consumers Act, which the Federal Trade Commission (FTC) enforces, requires the online contacts retailer to verify with the prescribing provider that the prescription is accurate. The MD/OD has 8 business hours in which to approve or deny the prescription, and if the online retailer gets no response within that time, the prescription is filled.⁶ That back-and-forth communication system is fraught with risk. 1-800 Contacts uses an automated phone call system: The patient inputs the prescription into the company’s website, and this is converted into a voice message that is sent to the MD’s or OD’s phone line. The initial verification phone call does not require the MD or OD to immediately verify the prescription. It simply conveys the required contact lens verification information so that the office staff can verify the contact lens prescription within the required 8-hour time frame. “And practitioners have complained about challenges that they face in communicating with the dispenser about problems related to the prescription,” said Dr. Glasser.

The FTC is in the midst of considering changes

to the verification standard because of various complaints. However, the FTC has said it is unlikely to make changes. Instead, it is proposing to increase record keeping requirements for practitioners—which the Academy strongly opposes.

Future Prospects

There’s no question that the innovative technologies of today present challenges for ophthalmologists. But they also demonstrate the promises and rapidly unfolding developments of telemedicine. For now, Dr. Jacobs believes that it is important to view the offering of Opternative and similar new offerings with some balance. “In its current form, these technologies may miss critical signs of eye disease,” he said, “but they could be useful for masses of people in the future.”

- 1 Gulshan V et al. *JAMA*. 2016;316(22):2402-2410.
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- 4 Good Morning America “Opternative Online Eye Exam Service Sparks Criticism from Optometrists.” Aired Aug. 5, 2016. <http://abcnews.go.com/GMA/video/opternative-online-eye-exam-service-sparks-criticism-optomtrists-41133310>. Accessed June 15, 2017.
- 5 “Frequency of Ocular Examinations–2015.” aao.org/clinical-statement/frequency-of-ocular-examinations. Accessed June 15, 2017.
- 6 Federal Trade Commission. “The Contact Lens Rule.” www.ftc.gov/tips-advice/business-center/guidance/contact-lens-rule-guide-prescribers-sellers. Accessed June 15, 2017.

MEET THE EXPERTS



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