I just graduated from optometry school... now what?

By Scott Sikes, OD

Unless optometry students are very fortunate or extremely organized, they will be faced with major life and career decisions right before or immediately after graduating. This is where being a planner or being very proactive can be extremely beneficial.

Where to practice

If students already know that they want to live in a specific state after graduation or—even better—a specific town, start looking for opportunities while still in school. While I was in optometry school, I took several trips back to my home state of North Carolina to meet with ODs who might want to bring in an associate or potentially sell their practice.

Zoom out to expand treatment for diabetes patients

By Michael R. Dueñas, OD, FNAP

While the dilated eye exam has been optometry’s core diabetes responsibility, an epidemic prevalence of diabetes, a state of therapeutic inertia, and greater overall morbidity and mortality from the disease means that ODs must more fully engage in an amplified and targeted challenge of diabetes in the U.S. An aspiring optometry student should push to expand point-of-care testing and CLIA certification; provide easier unrestricted patient access to earlier diabetes treatment protocols for anti-VEGF drugs; and perform laser surgery for glaucoma and retinal treatments.

In addition, optometry must expand relationships and cooperation via:—practice alliances focused on diabetes with pediatrics, behavioral health, family practice, internal medicine, endocrinology, and nursing; and—practice alliances focused on diabetes with pediatrics, behavioral health, family practice, internal medicine, endocrinology, and nursing.

DON’T BE MISLED

Prevent blindness with proper disease classification and management

Diabetic retinopathy

Case Report

Prevent blindness with proper disease classification and management

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WHY PRIVATE PRACTICE TRANSITIONS ARE CHALLENGING

Q A

Dr. Jennifer Coyle

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While the dilated eye exam has been optometry’s core diabetes responsibility, an epidemic prevalence of diabetes, a state of therapeutic inertia, and greater overall morbidity and mortality from the disease means that ODs must more fully engage in an amplified and targeted challenge of diabetes in the U.S.

As a profession, optometry should push for scope expansion for:

- Injectable authority to accommodate optometry’s increased need for point-of-care testing and Clinical Laboratory Improvement Amendments Act (CLIA) certification; and providing easier unrestricted patient access to earlier diabetes treatment protocols for anti-VEGF drugs
- Authorities to perform laser surgery for glaucoma and retinal treatments

In addition, optometry must expand relationships and cooperation via:

- Practice alliances focused on diabetes with pediatrics, behavioral health, family practice, internal medicine, endocrinology, and nursing

See Diabetes treatment on page 27

Zoom out to expand treatment for diabetes patients

Despite the advancement in diagnostic technology and treatment strategies, diabetic retinopathy remains a major cause of new onset blindness in the U.S. According to Centers for Disease Control and Prevention (CDC), more than 650,000 of the 4.2 million Americans with diabetic retinopathy (DR) have vision-threatening DR (VTDR).

VTDR, also referred to as sight-threatening diabetic retinopathy, is defined by the presence of diabetic macular edema or retinal neovascularization that are vision threatening. Either, if not closely monitored and/or treated, can lead to irreversible vision loss. Additionally the Vision Health Initiative (VHI) Report by the CDC indicates that the rate of Americans aged 40 years and older with DR and VTDR will triple from 2005 to 2050.

See Prevent blindness on page 25

DON’T BE MISLED

Prevent blindness with proper disease classification and management

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Jessica Crooker, OD
Owner, Scituate Harbor Vision Source
Scituate, MA

Dr. Crooker was compensated by Alcon for her participation in this testimonial.

One recent afternoon, I met with a college student who enjoys wearing monthly replacement contact lenses, but who was also having a common problem: her lenses felt great at the beginning of the month, but by week three, her days were being disrupted by ocular itchiness and discomfort. She often found herself replacing her lenses before the end of the month, and as someone looking to get the most out of her vision correction, this was not ideal. When the topic of her lens care routine came up, another issue was apparent: she was not consistently following the directions for use of her multipurpose lens care solution (MPS), only occasionally taking the time to rub her lenses before soaking them. Despite the best efforts of practitioners, this remains a problem that many of us encounter all too often.

Good lens care habits are key to a successful lens-wearing experience, so the recommendation I gave my patient was simple: switch to CLEAR CARE® PLUS for your daily lens care. CLEAR CARE® PLUS is a 3% hydrogen peroxide solution that, in addition to providing excellent disinfection and comfort (thanks to Alcon’s HydraGlyde Moisture Matrix), simplifies lens care by eliminating the rubbing step. For these reasons, CLEAR CARE® PLUS is a lot more than a ‘problem-solver.’ The same features that benefit the not-always-compliant college student also make CLEAR CARE® PLUS my first choice for any new lens wearer looking to start off on the right foot.

When introducing CLEAR CARE® PLUS to my patients, I take the solution and case out of the box and show it to them. They are always impressed when I walk them through how easy CLEAR CARE® PLUS is to use, and are excited to make it part of their routine. There is no rubbing with CLEAR CARE® PLUS, which is the step that my patient, like many others, often forgot when using MPS. Five simple steps are all it takes to effectively clean and disinfect lenses with CLEAR CARE® PLUS, and patients love the solution’s bubbling action, which lets them see it working, while also helping to reinforce good lens care habits. After demonstrating how to use CLEAR CARE® PLUS, I make sure that they take the CLEAR CARE® PLUS Patient Tip Card home with them to help ensure compliance. Making CLEAR CARE® PLUS my first-line lens care recommendation has had an undeniably positive impact on my patients’ lens care compliance, and study data agree with my experience — surveys show that 93% of habitual MPS users who try CLEAR CARE® PLUS agree that it is easy to use, and CLEAR CARE® PLUS’ design promotes significantly greater compliance with directions for use than MPS.

I want all of my reusable contact lens wearers to have an excellent lens-wearing experience. I recommend CLEAR CARE® PLUS because it makes lens care easy for patients, and when compliant lens care is easy, patients can enjoy their lenses. For all of my patients in reusable lenses, using CLEAR CARE® PLUS means a simple daily lens care routine and outstanding disinfection and comfort — all month long.

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5. Soak overnight or for at least 6 hours.

*Instructions presented here are for soft contact lenses only; additional instructions for RGP lenses are available in the CLEAR CARE® PLUS package.

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I didn’t realize STARS were little dots that twinkled

—Misty L, RPE65 gene therapy recipient

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Everyone tries to figure out health care

By Benjamin P. Casella, OD, FAAO
Chief Optometric Editor

Not long ago, I had the opportunity to spend quality family fun time in the Netherlands.

One particular aspect of the country which jumped out to me as quite progressive was the graphic photos on cigarette boxes which are mandated by the government (see Figure 1).

This photo was taken in North Amsterdam not far from the train station, and a few blocks away, the photo in Figure 2 was taken. It shows an advertisement for over-the-counter cosmetic contact lenses in many designs. The photos in these boxes were not just of icky eyeballs but also of people being reuscitated with warnings of lung disease risks.

I’m all for an effective tool to curb disease. However, the clinician in me mentally went right to those patients over the years who overwore their contact lenses and had incidences of keratitis as a result. Then, I thought about that one patient, a teenaged girl, I saw with a near-total corneal ulcer who had purchased cosmetic contact lenses from a flea market.

I’m not saying that smoking is any more or less dangerous than the improper dispensing and wearing of contact lenses. However, I thought it noteworthy to point out what I consider to be examples of big and small government with respect to health care functioning within a couple of blocks of each other.

All in all, I can’t wait to get back to that country, and, as soon as I hit a scratch-off, I’m headed back with the family. I regret the fact that I was looking forward to not thinking about eyeballs for a few days but ended up taking pictures of labels warning of blindness while my family waited outside. Seeing such warnings on cigarette boxes contrasted with the overt sale of contact lenses with no fitting ksects reminds me that, just as in the U.S., we are all still trying to figure out health care.

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Why Hollenhorst plaques can be key to carotid disease diagnosis
Microscopic cholesterol findings in the retinal arteries of a 74-year-old patient leads to a diagnosis of carotid artery aneurysm.

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1 How to control myopia progression in your practice
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2 How to diagnose a swollen optic nerve
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3 Macular degeneration A to Z
OptometryTimes.com/iTech/AMDatoZ

A DIFFERENT APPROACH TO TREATING DRY EYE IN JAPAN

Margie Recalde, OD, FAAO, takes a look at the contrasting approaches eyecare professionals in the U.S. and Japan have to dry eye treatment.

OptometryTimes.com/Blog/DryEyeJapan

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Optometry Times blogs
Vision loss diagnosis presents potential complications

Case study reveals conflicting diagnosis following the initial patient examination

A 55-year-old white male attended the clinic for evaluation with a vague chief complaint of reduced vision in each eye. He reported that this problem was mild, had been present for an undetermined period of time, the situation was approximately equal in each eye, and the “blur” was similar at distance and near. He denied eye pain of any sort as well as flashes, floaters, and discharge.

At the time of his visit, this patient was homeless and domiciled at a shelter. He had served time in prison and been involved in multiple fights. He reported taking no medications, denied the use of any alcohol or illicit or recreational drugs, and used over-the-counter reading glasses for near visual tasks.

Examination

Visual acuity was measured at 20/20 OD and 20/25 OS, not improving with pinhole or refraction. Evaluation of pupillary responses to light, extraocular muscle movements, and gross estimation of anterior chamber depth was normal. Slit-lamp examination of the anterior segment failed to reveal abnormalities.

Following pupillary dilation, the lens of each eye showed cortical changes that appeared premature for the patient’s chronological age.

Examination of the retina in each eye revealed the findings shown in Figure 1.

What appeared to be geographic atrophy in the right eye was incongruent with the clinical picture and visual acuity of the left eye. I was unable to reconcile the visual complaints and acuity reduction with retinal findings alone and discounted significant contribution from the lens changes.

Best disease

Ruling out geographic atrophy and questioning the patient regarding practices such as sungazing with denial, I considered the diagnosis of early adult-onset vitelliform macular dystrophy (AOVMD)—also known as Best disease.

The clinical presentation spectrum of this disorder is variable, and not all diagnosed patients suffer vision loss.2,5

In this case, the disorder manifested lipofuscin deposition deep in the retina. This could be seen in the right eye when evaluated with optical coherence tomography (OCT) centrally.

This presentation was consistent with a recent case reported by Seanna Grob, MD, MAS, and colleagues.7 The left eye showed apparent absence of photoreceptors and retinal pigment epithelium (RPE) centrally.

But there is a variety of presentations that may show visual complications as well as the characteristic vitelliruptive form often seen in patients with Best disease.1,2,4,6

Better prognosis

While the presentation of Best disease in younger patients is more common and devastating visually, the adult-onset form appears to have a somewhat better prognosis.7 However, that is not to say the adult form may not have complications.

Macular-hole associated retinal detachment has also been reported as a consequence.4,5,8

The present case has no apparent indication of macular thinning—which portends a better prognosis than if macular thinning had been identified.1,5

While the prognosis remains guarded for this patient, the current visual status is encouraging. AOVMD has been characterized by imaging modalities. The consensus diagnostic characteristics from OCT include a hyper-reflective area at the outer retina with no material visible between the photoreceptor cells and RPE layers.1,5

Each of these manifestations occurs in the present case. The pathophysiology has been proposed to include photoreceptor outer segment hypoplasia and impaired phagocytosis.9

Phenotypes, while varied, may have commonality with other ocular disorders as diverse as vitreomacular traction, age-related macular degeneration (AMD) pseudodrusen, and central serous chorioretinopathy (CSR).9

Conclusion

While this patient reported no past symptoms consistent with a previous diagnosis of CSR, it is tempting to speculate that it was a component. Management of AOVMD includes explanation of prognosis to the patient, regular monitoring for treatable complications that may be amenable to treatment, and genetic counseling.

This last item is significant because the age of onset may be as young as 40 years. Finally, ODs can play a role in visual rehabilitation of vision loss.

REFERENCES


BY LEO SEMES, OD, FAAO
Professor of optometry at the University of Alabama-Birmingham

Figure 1. The right and left fundus images of the case. Note that the area of involvement is greater in the left eye, and on stereoscopic examination the lesion did not show elevation.

Figure 2. OCT data cube of the right eye. On the reflectance image (upper left), the blots are artifacts and the cross-sectional image (lower left) as well as the cubic section show disruption of the inner retina with normal macular thickness. The left eye OCT images demonstrate photoreceptor loss (upper and lower left panels and lower right).
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Focus On   Practice management

How to overcome transition challenges

Planning ahead can ensure a successful outcome for ODs on both sides of the transaction. Previously in “Pros and cons of private equity firms in practice transitions” (April 2019), we shared the story of a colleague who finally came to peace with a decision to retire from a successful group practice he had founded.

After approaching his associates with a fair market offer for his practice shares, he was surprised when they declined the offer, stating that they did not see the value in buying the practice.

This conundrum of how to transition out of a practice is increasingly challenging for some ODs, while many younger colleagues are simultaneously seeking private practice opportunities. With a growing number of successful older practices simply being shuttered, let’s continue to tackle the question of why private practice transitions can be so challenging.

The American Optometric Association’s (AOA) 2017 Survey of Optometric Practice found that:

- 27 percent of ODs have been in practice more than 30 years
- 58 percent of ODs provide care in private practice

Given the aging provider population and large percentage of ODs in private practice settings, this topic is increasingly more relevant.

In this final installment of a three-part series, we will consider the traditional sale of a practice from one doctor to another.

Transition timeline

Transactions of this type can sometimes take three to five years—from beginning to consummation, so be sure to plan accordingly. Also consider whether the seller prefers to sign on the dotted line, hand over the keys and walk away, or if there is an option for the new owner to “buy out” over time with cash or sacrificed earnings with a transitional period during which the seller stays on to see patients. If the latter, how will compensation and benefits be structured?

Buyer profile

Does the seller prefer a new/recent graduate, an established associate, or a current practice owner? Someone native to the area or with local connections? There may also be the possibility of bringing someone on for a trial associateship to determine if such a transaction is a good fit. There is no right or wrong answer, but if there is a preference, it may change how to proceed in the next step.

Identifying/recruiting a buyer

Consider seeker postings on job boards, such as the AOA’s Career Center (https://www.aoa.org/aoaexcel/career-center), one affiliated with your state optometry association or your optometry school, or possibly one of the for-profit job boards. A seller should also consider listing his or her opportunity on those job boards, or in a school or state association’s newsletter communications.

Other lead sources include state association executive directors, state regulatory boards (if they are willing to share their list of new licensure applicants), and faculty at the schools and colleges of optometry. If planning early enough, an OD could recruit a future buyer from his current high school/college student patient base by encouraging them to consider optometry as a career—don’t roll your eyes, it has happened more often than you would expect.

Lastly, do not overlook the resources a practice transitions consultant or headhunting firm may offer for finding a buyer or a seller.

Practice valuation

While there is a fee associated with practice transition consultants that can be negotiated up front, the knowledge and experience they bring to the table can save time, frustration, and money in the long run—just be sure to ask if they have experience in eye care.

According to Bill Nolan, executive vice president of Williams Group, a practice’s value is based on its assets and earnings. Assets are tangible (equipment, furniture, fixtures, inventory, land, building) and intangible (“good will”—the value of which can be hard to determine). Earnings may be obvious—the more the better—but the amount of free cash flow (the cash that a company is able to generate after spending the money to maintain or expand its asset base) is also another general gauge for practice value. This differs from net income—the company’s profit, calculated by taking practice revenues and subtracting the costs of doing business (such as depreciation, interest, taxes, and other expenses).

These concepts lead to the four generally accepted practice appraisal methods in current use today:

- **Assets and earnings:** Valuation based on hard assets, good will, inventory, and supplies.
- **Capitalization of earnings:** An investment model with a capitalization rate of typically 15 to 20 percent.
- **Discounted free cash flow (DFCF):** Values free cash flow over time, considering the practice as an income-producing business.
- **Debt service:** Valuing the practice’s ability to service its debt.

Transition team

Consider utilizing your certified public accountant (CPA), a labor attorney, a practice transitions consultant, and—depending on the specifics of the transaction—an experienced banker/financial advisor to guide the decision-making process.

Financing the deal

Self-funding a transaction—as opposed to a buyer seeking an external source of funding—can be attractive to both parties by reassuring the buyer of the seller’s extended good will for the practice's success. It also generates sustained interest earnings and tax breaks for the seller.

Regardless of which funding mechanism is used, remember: Anything an OD can responsibly do to promote the new owner and help his former practice succeed will make the practice a more attractive option to buyers and therefore benefit both parties. A financial advisor, CPA, and consultant can guide an OD through this process and explain the financial and tax implications.

Other considerations

Will equipment and/or the land and building be part of the sale? When an OD sells the practice, he also needs to remember that he is no longer the owner. Let the new owner run things the way he wants to, offer advice only if asked.

There is much to consider when it comes to any practice transition. With proper planning, an OD can avoid becoming overwhelmed—as long as he does not procrastinate.

As Benjamin Franklin once said, “If you fail to plan, you are planning to fail,” so start planning now for a successful practice transition.

REFERENCES


Dr. W rotten serves as the practice’s chief operating officer and residency supervisor. He has twice been elected president of the Optometry Association of Louisiana, has been appointed to the Louisiana State Board of Optometry Examiners, and sits on the Board of Trustees for SCO. He enjoys playing golf, fishing, and coaching youth sports. He serves as a consultant to Alcon. cw rotten@od.sco.edu
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How artificial intelligence is changing the future of optometry

Artificial intelligence (AI), deep learning algorithms, and convolutional neural networks (CNN) have changed optometry, health care, and 21st-century society.

Computer-aided diagnosis (CAD) utilizing evolving, diverse databases are using complex, trained CNNs¹ to further the diagnosis and management of glaucoma, diabetic retinopathy, age-related macular degeneration (AMD), and refractive conditions such as keratoconus, pellucid marginal degeneration (PMD), and other corneal ectasias.

Technological impact
The modern field of optometry will move exponentially toward the intersection of disruptive technologies, especially AI, as we progress into the 21st-century.

Autonomous robots, automobiles, facial recognition on smartphones, and smart global positioning systems (GPS) have become integral to everyday life.²,³

As the fields of neural and cognitive science converge, it is important for ODs to understand the ethical and legal implications involved in utilizing these new technologies in day-to-day practice.

The growth of AI in optometry and health care needs to be understood and appropriately utilized by ODs today.⁴

Indeed, changes in the optometric workforce will occur as roles evolve. The ability to use innovative technology, digital thinking processes, and critical thinking will create new opportunities in eye care as ODs move further toward “data analysis” and away from “data collection.”⁵

AI allows ODs the opportunity to improve patient outcomes for the global healthcare community.⁶

It is my contention that the skills acquired from an education in the humanities will be the most important determinants in providing future high-quality optometric care.

Being competent in the use of innovative technologies is a must that will include critical thinking and the ability to manage complex cases in real time.

Patient communication and education skills involving cultural competence, language, and alternative forms of communication (such as mobile technology)⁷ are also critical.

Adapting to change
The proper recognition of ODs’ common “humanity” with patients mandates that they understand how AI can alter traditional models of the “professional-patient” relationship.

Codes of medical ethics have never fully addressed the obligations of ODs, physicians, and other healthcare providers to veracity or truth-telling.⁸

Certainly, the Optometric Oath and Hippocratic Oath have emphasized the virtues of honesty and truthfulness.⁹,¹⁰

However, conflicts with beneficence have historically led to a variety of different methods in the management of a patient’s medical information, including limited disclosure, staged disclosure, and nondisclosure.¹¹

Advancements in practice
AI based on deep learning algorithms has been applied to OCT, visual fields, and medical imaging (funds photography) to detect glaucoma, diabetic retinopathy, and age-related macular degeneration (AMD).¹²

Strong communication skills are vital to maintain patient satisfaction and provide optimal care

AI is being applied to wavefront aberrometry to improve the diagnosis and management of keratoconus and other corneal ectasias.¹³ Data is being collected around the world to facilitate the accurate diagnoses of these conditions. Nidek’s Refractive Power/Corneal Analyzer OPD Scan III utilizes AI protocols,¹⁴ and future expansion of these capabilities are undoubtedly in optometry’s future.

In an era of technological advances in health care, ODs’ communication skills will be highlighted. ODs will potentially be spending less face-to-face time with patients, which can lead to a breakdown in the doctor-patient relationship.

Strong communication skills are vital to maintain patient satisfaction and provide optimal care. AI should be used and analyzed correctly, and ODs have a duty to ensure that patients are educated properly. ODs must not only be able to use technological advancements but also maintain the foundation of doctoring: caring for patients.

In-person patient care
Research has shown that patient satisfaction increases with length of time spent with their doctor.¹⁵

With the advent of the electronic healthcare...
The challenge for the optometric profession is for ODs to place the well-being of all patients as their first priority.

References


Dr. Wong is a Diplomate of the American Board of Optometry and a member of the AOA Ethics committee and AAO Ethics GPE. He is a past president of the Maryland Optometric Association, and an appointee to the American Medical Association’s Physician’s Consortium for Performance Improvement-PCPI’s Technical Advisory Panel for Eye Care Metrics. He lectures on the topics of medical ethics, technology and innovations in eye care, ocular disease, mobile health apps, and contact lenses.
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- Illuminance, the human perception of the brightness of visible light received at the eye (lux).
- Chromaticity, the color of light based on the wavelengths and intensity that combine to make a color.
- Correlated Color Temperature, the temperature of a black body light source that would produce similar shade of white to the measurement -how blue or red and white light appears.
- Color Rendering, how truthfully a color is shown by the light measured compared to if the color was lit by bright sunlight.
- Flicker, the speed and characteristics of repeated changes in light intensity particularly noticeable with LED lighting.
- Equivalent Melanopic Lux, a measure of the light intensity in wavelengths that promote alertness (melanopic range), which can cause sleep and health problems.

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ODs strive to always focus on managing the contact lens patient. But sometimes they are tempted to stop shy of 100 percent, especially once a patient’s complaints have quieted. Here’s one such example.

Patient CA presented as a new patient six weeks ago with complaints of mild light sensitivity in both eyes for the past several years. The photosensitivity is constant—but much worse outside—and she needs to wear sunglasses if it is daylight.

Her medical history is unremarkable. She takes birth control pills and 800 mg ibuprofen prn (Advil, Pfizer). She wears Acuvue Vita (Johnson & Johnson Vision) from 7 a.m. to 11 p.m., disposes them monthly, and “never” wears her prescription glasses.

She uses OptiFree Replenish Multi-Purpose Disinfecting Solution (Alcon) for contact lenses twice a day before contact lens insertion and after removal. CA works on the computer at least 10 hours per day and complains that her eyes are dried out and irritated by evening.

Optical options
An OD’s first impulse is to scream, “Well, of course!”

Ten hours at the computer with contact lenses could cause anyone to be annoyed. But it was clear there was something more causing the light sensitivity CA was experiencing.

Nonetheless, ODs have to be readily armed to discuss computer habits and computer setup, including distance and height, timing of breaks, and inclusion of blink exercises.

Career device users are more and more common, and the time to discuss these things continues to diminish.

I urge ODs to incorporate patient education pieces to do the talking. While these tips are second nature to ODs, it needs to be spelled out to patients.

Do not take it for granted that they know how to influence their work environment in a positive way.

CA was correctable to 20/20 OD, OS with a refraction of OD: -2.50 -0.75 x 175 and OS: -3.00 -0.50 x 147. This 38-year-old patient requested an addition of +1.25 D. However, she denied computer or near strain.

We discussed her optical options to reduce the strain:
- Eyezen lenses (Essilor) for her non-contact lens hours
- A computer pair for screen time
- Distance-vision-only (DVO) contact lenses with plus specs
- Multifocal contact lenses

CA was adamant about staying with her DVO contact lenses—and I was adamant about her moving into a daily disposable wear modality—so we met in the middle.

Evaluation
We performed a screening with the Oculus Keratograph 5M. CA’s Crystal tear report screening showed low tear meniscus height, no color on interferometry, and increased hyperemia in both of her eyes.

The patient was able to see the test results on the printout and understand that her symptoms may be more than just an annoyance. The preliminary slit lamp exam confirmed the findings.

Figure 1. Oculus Keratograph 5M screening performed during all routine dry eye exams.
This diabetic retinopathy (DR) patient’s clinical exam revealed nothing out of the ordinary. And his OCT B-scans only showed changes in a small area. But the new AngioAnalytics® OCTA metrics clearly quantified retinal vessel loss throughout the entire scan area over the course of two years. For objective OCTA data analysis to aid clinical evaluation of DR, the logical choice is AngioAnalytics—only from Optovue. Visit optovue.com/angiovue for details. It will be revealing.
of the screening, allowing me to facilitate the conversation and recommending that CA return for a full dry eye assessment. We discussed transitioning to a better contact lens material and shortening her wear time at least by a few hours—a reduction from 16 to 12 hours per day. CA was fit into Dailies Total 1 (Alcon), masking the astigmatism.

We also discussed improving the ergonomics of her workspace, her diet and water intake, and incorporating blink exercises into her routine. We agreed that the main goal is for her to be able to wear contact lenses for years to come without a significant consequence to the ocular surface.

I explained that while the current measures will help, we need to explore the underlying challenges causing her to be so photophobic. CA was scheduled for a full dry eye evaluation (DEE) one month later.

Follow-up visit
Upon her return, I learned that CA had “felt” her eyes for many years and had told “at least three” other doctors. She listed three brands of contact lenses, three brands of contact lens solutions, and five brands of rewetting drops she had tried during this time.

On a side note, while I am constantly amazed at the variety and volume of eyecare products that I see on the grocery store shelf, I sometimes wonder if consumer availability is a disservice to patients. They go from one product to the next, masking their symptoms, while their underlying problem could be getting worse.

CA had moderate tear film debris and a low tear meniscus height of 0.16 mm and 0.18 mm OD, OS. Her osmolarity was 310 and 328, respectively. There was only trace color on interferometry, non-invasive keratography break-up time (NIK BUT) was 10 and 24 seconds, and tear break-up time (TBUT) was 2 and 6 seconds. There was mild corneal haze in both eyes, and grade 2 conjunctival hyperemia, grade 2 papillae OD, grade 2 to 3 papillae OS, and grade 1 conjunctival punctate staining nasally with lis-samine green.

Meibomian gland evaluator and manual expression of the lid was unproductive. She exhibited severe meibomian gland truncation and dropout on the right upper and lower lids and moderate loss on upper and lower lids OS.

Surprisingly, only rare partial blinks were documented, and there was no gap on the Korb-Blackie (KB) light test.

My assumption is that had she been wearing her contact lenses, I would have video-captured her contact lenses, I would have video-captured

CA was adamant about staying with her DVO contact lenses—and I was adamant about her moving into a daily disposable wear modality—so we met in the middle

One study showed that 32 percent of patients using tears daily had worse vision after one year. 1 Of course, all the blame cannot be placed on CA for her shopping habits because she had given three doctors the chance to guide her to a resolution.

At her DEE, CA noted feeling much better symptoms she experiences.

Next steps
I spent a few minutes telling CA her story by showing her the pictures on my SM and discussing treatment options. My recommendations for CA are as follows:

- Evacuate the remaining glands with LipiFlow (Johnson & Johnson Vision), then attempt to keep the flow moving via medical grade ome-gas and daily warm compress for 20 minutes with TranquilityEyes (EyeEco).

- I explained that our main goal is to keep the remaining glands from degrading, but LipiFlow will likely have a positive influence on the evening symptoms she experiences.

In fact, subjects in Blackie’s 2018 trial were able to increase comfortable wear time by an average of four hours per day within one month after the procedure. 2

These recommendations were in addition to the prior ones regarding diet and environment.

REFERENCES

Dr. Brimer has special interests in contact lenses and dry eye. She has received study or sponsor support from Alcon, Aliden, Allergan, Bio-Tissue, BliPlex, Care, and PRB. Dr. Brimer serves as a consultant for Oculus.

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Pros and cons of mobile optometry

A doctor shares how taking the clinic to the patients puts ODs in the heart of communities

The feel of an Apple store but for optometry and on wheels,” is what they told me they wanted.

Patients don’t have time for eye exams in their busy lives, so optometrists must bring the services to them, they said.

I had just finished working two years for an ophthalmologist and, after hustling from 9 to 5 plus working nights and Saturdays, I was ready to hit my patient volume and get that big bonus.

The only problem was the office added another doctor, which cut my patient encounters in half—and my bonus disappeared.

I learned then that I needed more control over my career. This is what led me to a strange Craigslast ad about mobile optometry.

On the road

Mobile optometry can have many different faces. It can be the screenings for which optometry students volunteer. It can be trips to the nursing homes across the state. It can be volunteer trips to developing countries. It can be home consultations in concierge settings.

Me, mobile optometry was exciting. In the years since joining a mobile optometry practice, I have learned a great deal more about each of the communities and where there are needs for our services.

The truth is that optometrists practice in a variety of settings, and it can be hard to believe that there is still a lack of service out there. Even in major metropolitan areas, there are pockets of underserved patients. There are health centers without ODs, many public schools that could benefit from a mobile OD, and, yes, even a sea of healthy adults who simply do not go in for preventative eye care more than once a decade because they are plain lazy or too busy.

Cons

Let’s start with the downsides. The first challenge is the cost—it’s expensive.

Depending on how the mobile clinic is configured, money can be spent or saved. Our company opted for the most expensive way possible.

It cost $250,000—at a minimum—to get the truck outfitted and customized with the newest auto refractions, non-contact tonometer, fundus camera, digital phoropters, and more.

After that, add in the staff: truck staff and headquarters staff. Pay for new employees will be well below average because these mobile clinics were not self-sufficient initially.

Don’t forget rent for headquarters, too.

Plus, there is a huge amount of infrastructure to get the appointment book filled and find new companies at which to see patients. With the reimbursements landscape, mobile optometry clinics need to see a high volume of patients—four to five per hour is typical...

Furthermore, weather can be a monster. Mobile ODs travel to a different “office” each day, and that means dealing with snow, heat, and rain.

During the winter, it might take two hours for the clinic to warm up past 50°F—which means the fundus camera can’t be used until after 10 a.m., so patients have to return for photos unless they were dilated at their exams. Sometimes, it is so cold that the computers won’t boot up.

In the middle of summer, if the air conditioning isn’t working, the doctor is sweating by the second patient. The rain is a mess on the floors and causes slip and fall challenges. Really though, I just hoped there wasn’t a leak in the roof directly above the new AR/NCT combo unit.

The next complication is traffic—and it’s not always fun. Most mobile RV clinics need to operate in densely populated cities. Cities create traffic patterns and because you are travelling to a different place every day, you may not know the pattern. I drove a clinic myself for over two years.

Seven-hour clinic days would turn into 11- or 12-hour days away from the family simply because of the traffic and the driving. There was even an incident when the driver side window blew up because of a defect and sprayed glass all over my face.

In addition, broken equipment will affect your day. I include the Wi-Fi connection with broken equipment because to access patient histories, process payments, and update records into the cloud, an internet connection is 100 percent necessary.

Aside from this, the truck is bumpy, and there are many potholes on the road. Gears on instruments will be broken, slit lamp prisms misaligned (repairs can cost over $1,000 to fix those prisms), whole display racks of glasses can fall off the wall.

The generator might just stop working, and with no electricity you can’t see patients. Some days the slit lamp will be off the table and on the floor or a
laptop will have slid off the counter and cracked the screen on the floor.

There were days where I had to crawl under the RV and manually crank the leveler to raise and lower it just to be able to drive the vehicle. There were days where the other employees would crash into low overhangs, run up on curbs, or simply get sideswiped by other vehicles. To me, driving an RV in the city was no big deal, but for others, it is a daunting task with a steep learning curve.

Continuity of care is a concern but not necessarily a con. The mobile clinic would work to coordinate care at another office, but it never had its own home office to keep patients in house. We would detect and refer.

I managed to identify two ocular melanomas in my first year. There were many cases with various retinopathy, glaucoma, cataracts, and more. As the doctor, you are able to get the patient the help he needs and drive the point home about the importance of yearly monitoring, but you don’t get to handle the follow-up care and treatment in the majority of cases.

Pros

The patient base is pleasant. Patients usually pre-filled out health history and insurance information.

Timing works differently at a mobile clinic. Seeing the employees of major client means that everyone has the same benefit, so there is less delay on
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the delivery end. Patients were also trained to be on time. They were turned away if they were two minutes past their scheduled time.

It is nice to have the machination down to a science. When it works, it works really well. Mobile ODs have the opportunity to help more people due to the patient volume, and as mentioned in the cons sections, they will catch previously undiagnosed disease. The patient base is on the whole very healthy, so not many curveballs are thrown during the day. The mobile OD receives reports back regarding all patients who were referred to other clinics for follow-up care.

Gratification and recognition are great. The patients are very grateful for services. People are motivated in different ways, but recognition is a powerful factor in happiness—at least in my experience. The ones who are ungrateful (because you can’t make everyone happy) are not even an afterthought. The patients are typically working professionals who are happy that you are here to help.

I remember, shortly before I left, seeing one of my very first mobile patients for the fifth routine exam in just four short years (8/14, 7/15, 7/16, 6/17, 5/18). I also referred her young children to a local eye doctor and hear about them and the glasses they got because I was able to educate her on the importance of exams for children.

Schedule and holiday time are a bonus. The important thing to remember about seeing people at work is that when they get vacation, you do, too. Most major employers observe major staffing dips at all holiday times, and don’t forget summer hours with slow Fridays. I was given great deal of vacation time and regularly took off from December 21 through January 3, along with the plethora of three- and four-day weekends throughout the year.

There are also those days when the generator goes out, so you get to go home. The owners of the mobile clinic don’t like when this happens, but it is a nice perk for the employees. There are also snow days, and sometimes a bridge collapses so you can’t work that week due to traffic.1

Moving on
I enjoyed working in a mobile optometry clinic, and I left because of salary.

I had asked for a 10 percent raise to bring my base up from $100K to $110K, which was still below market value in Boston. My employers countered with a 2 percent raise. Coincidentally, two employers who I had contacted three years prior about part-time work to supplement the growth of the mobile clinic got in touch with me within 48 hours of my salary review. They offered me $145K and $150K.

I accepted an offer with a prison at $150K because of the flexibility and salary. I worked only three days a week earning more than I made working five days at the mobile clinic. I used my extra days to help the clinic transition as they searched for my replacement. That search ended up taking 10 months.

I also worked for another mobile clinic, a direct competitor. That clinic used less equipment but brought it inside the businesses it serviced. That model worked well; however, the user interface was different, and the open settings seemed impersonal. Patients seemed to like that mobile clinic model as much or more simply because they didn’t have to go outside. This model sold more pairs of glasses because patients would bring co-workers to help them choose frames and the comfort of the building allowed for more space to walk around and talk then in the much smaller converted RV clinic.

REFERENCE

Dr. Haigh received his doctor of optometry at the New England College of Optometry. He enjoys spending time with his family and rooting for the New England Patriots.

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Mobile optometry

Continued from page 18
Each state’s optometric association can be a valuable resource for potential or new graduates. Contact the association to learn about classifieds that ODs have posted. This will give you points of contact and potential leads to follow.

The state(s) where new grads want to get licensed should be the first target. Some states require only that ODs pass the National Boards, while others have a separate law test or specific oral, written, or procedural state boards with which to contend. Know the licensing requirements for the states in which you want to practice.

Another recommendation includes becoming licensed in a few states—especially if new grads are not 100 percent set on where they want to live and/or practice. It can sometimes be much easier to get licensed right out of school when everything is still top of mind from boards.

For the states in which new ODs want to practice, research their scopes of practice as well. Desire to practice full-scope optometry, including lasers and minor surgical procedures, means crossing some states off the list. All ODs hope that future grads will have more state choices because optometry scope expansion is growing across the United States.

**Waiting for boards**

Once new ODs have figured out where they want to practice, they should find something to do with themselves while waiting in limbo to take the individual state boards. For most ODs, this simply involves finding a practice (hopefully one where they intend to work later) in which the current ODs act as the attending doctor.

Once new grads have passed their state board(s), they are all set now, right?

Well, sort of.

**Mode of practice**

As I see it, several questions need to be addressed:

- What mode of practice is preferred?
- Do new grads like the corporate or commercial side of optometry?

For example, new ODs should ask themselves if they would like to be able to make decisions for their offices and change things as they see fit to suit their practice styles. Or would they prefer to see patients without worrying about managing the office?

Speaking from personal experience, working in a corporate practice immediately out of optometry school was a good transition for me. It let me focus solely on the patients and not have to worry about running the business of the practice.

Yet, it wasn’t what I wanted long term. I wanted to be able to make changes to my schedule, adjust office policies, and customize the way I practice.

That is why private practice was ultimately my goal.

However, I found that jumping immediately into private practice proved to be more difficult than finding a corporate position. I wanted to find a private practice where I could buy into the practice and eventually buy out the current OD upon retirement. As you can imagine, those kinds of opportunities don’t come along very frequently—especially if you want to relocate to a specific area.

Because the bills don’t stop coming, this is another reason that having an opportunity to practice somewhere else is beneficial while waiting for the right opportunity to present itself.

**Details matter**

When accepting an offer to work for anyone at any office, be deliberate and attentive to agreements or contracts that you sign.

**Become licensed in a few states—especially if new grads are not 100 percent set on where they want to live and/or practice**

ODs should get a lawyer whom they trust to read through all documents before signing them. As a side note, even with a lawyer reading through everything, ODs should read the documents even more intensely to make sure they sound correct.

Lawyers are knowledgeable, but they may not know questions to ask or what to look for as it relates to optometry or a new OD’s situation.

For example, a new grad may have verbally agreed to a specific salary or covenant not to compete clause, but it may be written differently in the contract. The lawyer would not necessarily know that it is different unless the new grad provided the lawyer with specifics to look for ahead of time. The lawyer may advise that the contract is valid even though it is not what the new grad agreed to in the negotiations. In short, you are your best advocate.

**Gaining perspective**

Clearly, there are many decisions to be made around the time of graduation. The best advice I can offer is to think about things from every angle and perspective. If a new OD is considering making one decision, try to think about the cascade of effects that may occur based on that one decision.

**All ODs should get a lawyer whom they trust to read through all documents before signing them**

Don’t forget to ask for help. Even though new doctors may have tried to think of all the potential benefits and downsides, they may have missed something. Always talk to a trusted classmate, mentor, or family member before making big decisions.

Finally, new optometry school grads must remember they are never stuck in one position. Some of the best parts of being a licensed optometrist is the ability to gain licensure in multiple states or to get a license in a new state if desired and to practice the way that they want.

Do what you love and love what you do.
3 mental health conditions to watch for in patients

Make a difference in a patient’s life by asking questions and recommending treatment

I challenge all ODs to ask their patients a few more questions during an exam. Specifically, screen for mental health concerns and make it part of optometry’s systemic disease investigation. In 2016, the National Institute of Mental Health (NIMH) reported that approximately 18.3 percent of adults in the U.S. had a mental illness. Furthermore, only 44 percent of those with mental illness received treatment. This means about 1 out of 10 patients may have a mental health condition that is not diagnosed or being treated.

Even more alarming are the statistics for adolescents. A recent study in England found that 23.9 percent of women aged 17 to 19 were likely to have a mental disorder, specifically depression and anxiety. This statistic is double that of men of the same age group. According to NIMH there is a 49.5 percent lifetime prevalence of any mental disorder among those age 13-18.

Unfortunately, there is a shortage of mental health care providers, so primary-care physicians lead to death.

There are multiple types of depression; however, this article addresses persistent depressive disorder, or clinical depression. This is defined as “a depressed mood that lasts for at least two years.” Symptoms may include, but are not limited to:
- Persistent sad, anxious, or “empty” mood
- Feelings of hopelessness, or pessimism
- Irritability
- Feelings of guilt, worthlessness or helplessness
- Loss of interest or pleasure in hobbies and activities
- Decreased energy or fatigue
- Moving or talking more slowly
- Feeling restless or having trouble sitting still
- Difficulty concentrating, remembering or making decisions
- Difficulty sleeping, early-morning awakening, or oversleeping
- Appetite and/ or weight changes
- Thoughts of death or suicide, or suicide attempts

This list includes “classic” symptoms like hopelessness, loss of interest, and so on; however, approximately 70 percent of patients with depression present with somatic complaints. These somatic symptoms are much more socially acceptable yet can also delay the diagnosis of depression because physicians are looking for the cause of the somatic concerns, not the mental aspects.

Somatization is not necessarily a coping mechanism but a true sensation related to the depression. Pain and depression share common biological pathways, specifically with serotonin and norepinephrine. Multiple tests can screen for depression.

The first test is the Patient Health Questionnaire-2 (PHQ-2). Any positive response will require that physicians administer the Patient Health Questionnaire-9 (PHQ-9). The PHQ-2 has a low specificity for depression; however, the PHQ-9 has a much higher specificity. The PHQ-9 will take two to five minutes to administer, and many doctors will print the form for the patient to fill it out, which may allow the patient to provide candid responses.

The screening result may provide a way to start the discussion on consulting a mental healthcare or primary-care provider. In addition, discussing the link of depression to physical complaint should be stated clearly. Some ways to help these interactions is to give the patient adequate time, demonstrate good listening skills, and provide empathetic responses.

Depression

- PHQ-9 and GAD-7: https://www.phqscreeners.com/select-screener/38
- Mini-Mental State Exam (MMSE) or Folsiein test: https://www.hpa.gov.au/what-we-do/standardised-mini-mental-state-examination-smmse
- Clock-drawing test: https://www.verywellhealth.com/the-clock-drawing-test-98619

Be aware of any suspicions of suicidal tendencies. Suicide is the tenth leading cause of death in the United States and the second leading cause of death in those 10 to 34 years old.

If an OD suspects that a patient has suicidal tendencies, ask her if she has considered hurting herself or asking if she is safe. If there are immediate concerns, call 911. In addition, patients can call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

Anxiety

Anxiety is defined as fear and related behavioral disturbances in anticipation of a future threat. Individuals with anxiety will typically overestimate the danger in situations. Fear, on the other hand, is the emotional response to a real or perceived imminent threat. Anxiety may develop in childhood and is more common in females at almost a 2:1 ratio.

General anxiety disorder (GAD) may be diagnosed when an individual finds it difficult to control excessive worry and when this worry can impact function. Most ODs have experienced patients who have anxiety for certain procedures. The anxiety response is often reduced by good patient education on what will occur and empathetic listening. With GAD, the anxiety can be a larger concern, and the patient may avoid necessary eye care and/ or other areas of support.

Similar to depression, there is a screening tool for GAD called the GAD-7. This is a series of questions regarding different symptoms over the prior two weeks. Again, providing patients time to answer the questions by themselves may provide more earnest answers. Scores of 10 or above have a good sensitivity and specificity. For those with greater scores, there is a correlation with functional impairment. Similar to depression, providing a safe environment in the office and giving the patient time is critical for a productive interaction.

When it comes to treatment for anxiety, psychotherapy and pharmaceutical therapy are effective. Additionally, exercise can be an effective, inexpensive way to help with management. Exercising at 60 percent to 90 percent of maximal heart rate for 20 minutes for three times per week shows a benefit. The same effect is also seen with yoga. A change in diet and better sleep may also be helpful.

Dementia and Alzheimer’s

Dementia is an overall term that describes loss of cognitive function and behavioral abilities that reduce a person’s ability to perform daily life activities. Dementia is caused by damage to brain cells and different conditions can cause this. Alzheimer’s disease (AD) is the most common cause
of dementia.\textsuperscript{16,17}

There are over 46 million people in the world living with AD, and this number is expected to rise to 131.5 million by 2050.\textsuperscript{18}

Alzheimer’s disease is caused by a buildup of beta-amyloid in the synapses between nerve cells. In addition, fibers of protein, called tau, build up inside cells.\textsuperscript{12} Due to the impact on the brain’s function, inflammation is triggered by the body’s immune system, and the cells eventually die. This cell death impacts function of the individual, and this can eventually lead to death.\textsuperscript{17}

One of the first symptoms of AD is difficulty remembering newly learned information. Symptoms progress to:\textsuperscript{17}

- Eventual disorientation
- Mood changes
- Confusion
- Behavior changes
- Difficulty speaking, walking, swallowing.

Because of the slow progression, these changes are not obvious to those living with the individual.\textsuperscript{22} Early diagnosis is very helpful when it comes to treatment.

Diagnostic tests are traditionally subjective in style, so research is focused on objective diagnostic tests. Currently, there is a great deal of attention on ocular signs—specifically, how ocular coherence tomography (OCT) of the retina may provide an early diagnosis.

One study showed a reduction in the mean retinal nerve fiber layer (RNFL) in all four quadrants around the macula in those with AD. In addition, those with mild cognitive impairment (MCI) had decreased RNFL thickness compared to controls.\textsuperscript{18}

Another study, which had a small number of participants, identified biomarkers for AD in positron emission tomography (PET) and computed tomography (CT) scans. Those with positive biomarkers tended to have smaller inner foveal thickness (66 μm vs. 75.4 μm) and a larger foveal avascular zone (0.364 mm$^2$ vs. 0.275 mm$^2$).\textsuperscript{19}

More research will be published on this topic, and the results will likely shape our practices in the near future.

Two investigational ophthalmic tests for AD show promise. One is from NeuroVision which uses curcumin to attach to the beta-amyloid in the retina that then identifies fluorescence with their instrument. Another type of test (Cognoptix, Inc) uses a laser-scanner to detect beta-amyloid in the lens.\textsuperscript{20}

Both of these have a high specificity for AD.

Subjective tests can be performed for MCI. One is the Mini-Mental State Exam (MMSE) or Folstein test that takes about 10 minutes and can be found online.\textsuperscript{21}

Another recent study measured reaction time to visual, auditory, and auditory-visual stimuli.\textsuperscript{22} This study shows two things may occur in patients with MCI: a shift from the dominant visual sense to an auditory dominant stimulus response combined with a slower reaction time to audio-visual stimuli when compared to healthy young individuals and healthy older individuals.

More research needs to be conducted; however, this study shows promise to identify MCI earlier via a simple audio and visual stimuli reaction test. The clock-drawing test requires the patient to draw a circle, label the numbers of a clock, then draw the hands to point at “10 minutes past 11.” This test is able to be administered quickly and can be a good screening for cognitive function.\textsuperscript{23}

Treatment for dementia is currently focused on maintaining memory. The use of cholinesterase inhibitors is commonly used; specifically, donepezil, rivastigmin, and galantamine. These are prescribed in early to moderate stages. For later stages, memantine is often prescribed to help with memory, attention, resonsing, language, and the ability to perform simple tasks.\textsuperscript{24}

Keep a watchful eye
Optometrists are tasked with assessing for systemic concerns as part of the care for patients. By screening for common mental health disorders, ODs may be making a significant impact on a patient’s mental health on page 24.
Mental health
Continued from page 23
life—possibly even saving it. The challenge to all ODs is to incorporate these screenings into the care of all patients.

REFERENCES

Dr. Horn is a past chair of the American Optometric Association’s Sports Vision Section and is a current member-at-large of the AOA Sports and Performance Vision Committee. He works with amateur and professional athletes from multiple sports and has lectured internationally on sports vision and primary-care optometry. Dr. Horn graduated from Pacific University College of Optometry and completed a residency in primary care and ocular disease at the Perry Point VA hospital. He is a co-owner of Sports Vision Pros LLC, an interprofessional online community dedicated to informing everyone about the role of vision and performance. Dr. Horn has been a paid speaker for Sanofi Genzyme.

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Primary Care
With a high and rising incidence of DR and VTDR, eyecare providers in any practice mode will encounter patients who knowingly or unknowingly have diabetes and may suffer from DR of any level.

Stages of diabetic retinopathy have been classified by several schemes, with the two most common being International Clinical Diabetic Retinopathy Disease Severity Scale and Early Treatment of Diabetic Retinopathy Study (ETDRS).

Regardless of the classification scheme, diabetic retinopathy is first clinically defined by the presence of microaneurysms (MAs), which are small outpouchings of retinal capillaries. Figure 1 illustrates the progression from early DR to more advanced/VTDR. Therefore, when a patient first presents with VTDR (Figure 1), we must consider that this process began with an early, less aggressive/more treatable form, perhaps with few MAs (Figure 2). Conversely, when we detect a few MAs (Figure 2) we should consider that if not properly managed, the disease may progress to more severe stages with visual consequences (Figure 1).

Case report
A 47-year-old white female is seen for examination with no chief complaints. She has a past medical history of type 1 diabetes mellitus, diagnosed 34 years ago, with recent hemoglobin A1C of 6.9; essential hypertension, diagnosed 20 years ago, well-controlled on medication; and obesity.

Medications include furosemide 20 mg tablet, lisinopril 2.5 mg tablet, metoprolol tartrate 25 mg tablet, naproxen 500 mg tablet, insulin aspart 100 unit/ml solution, potassium chloride 10 mEq tablet extended release, and vitamin D2 50,000 unit capsule.

On physical exam, visual acuity was 20/20 in each eye, intraocular pressures were OD 19 mm Hg and OS 20 mm Hg. Other anterior segment findings were normal with the exception of trace nuclear sclerosis bilaterally.

Undilated fundus exam was remarkable for a few MAs with no macular edema, which was confirmed with optical coherence tomography (OCT) (Figure 2).

Based on this retinal exam finding, this patient can be diagnosed with mild non-proliferative diabetic retinopathy (mild NPDR) without macular edema (International Clinical Disease Severity Scale for DR2).

If this was a patient under your care, what would you do next?
- Education and follow-up in one year
- Dilate at this visit or on follow-up exam made shortly after this first exam
- Refer patient to retina specialist

Based on this finding, this patient can be diagnosed with moderate NPDR.

How would you manage this patient now? See what happens with further investigation. Fluorescein angiography reveals a more concerning picture with presence of capillary nonperfusion and neovascularization everywhere (NVE).

Based on this constellation of findings, the patient should be classified as proliferative diabetic retinopathy (PDR), which is a vision-threatening stage.

Discussion
Diabetic retinopathy, regardless of staging, can be challenging to correctly categorize and manage. Clinicians and patients alike face several barriers to proper screening and management of diabetic retinopathy. These barriers are even more pronounced when patients are still at a stage of their disease course in which they are visually asymptomatic.

A systematic review identified lack of knowledge, attitude, awareness, and motivation as major barriers to appropriate eye care in this context. Enablers, meaning factors that enable one to seek out appropriate medical care, included fear of blindness, proximity to screening facility, experience of vision loss, or concern for ocular complication.

More than 70 percent of the studies included in the Piyasena et al review included patients of high income setting. One could speculate that the negative impact of these barriers are more profound and the positive impact of enhancers is diminished in the lower socioeconomic class.

Aside from concerns pertaining to access to care, correction classification of disease remains a diagnostic challenge for clinicians.

In the example of our case patient, incorrect classification (diagnosing this patient with moderate NPDR as opposed to PDR) will lead to lack of timely treatment (observation as opposed to panretinal photocoagulation/anti-VEGF) as well as an inappropriate follow-up interval (three to six months as opposed to one month).

During this follow-up interval, this patient may develop further complications such as vitreous hemorrhage or tractional retinal detachment that could have been minimized with more timely treatment.

While classification systems of nonproliferative and...
Proliferative DR have been validated based on presence of certain retinal lesions, the rate of progression to VTDR is less predictable. Guidelines have been published for appropriate timing of follow-up and if referral to a retina specialist is indicated based on disease severity.

However, adherence to guidelines without consideration of risk to progression of VTDR (such as history of noncompliance, missed appointments, status of the fellow eye) may lead to infrequent follow-up for patients at high risk for progression and too frequent follow-up for those with low risk of progression.

Thus, management of these patients should be tailored to the patient, not solely guideline-driven. The complexity of DR assessment and management includes inadequate assessment, appeasing patients, and patients’ poor compliance to their medical regimen and follow-up eye care. It is aided by existence of mitigating factors and comorbidities such as:
- Smoking
- Lack of exercise
- Poor dietary habits
- Obesity
- Systemic hypertension
- Lipid disorders
- Sleep apnea
- Cardiovascular disease
- Carotid artery disease
- Hematologic disorders (anemia, renal failure)

These factors need to be considered and/or investigated in proper management of patients with diabetes with or without DR. If addressed, DR does not have to be a “blinding” disorder because effective treatments battle this potential catastrophic condition.

In the case of this patient, fluorescein was considered due to longevity of diabetes compiled with HTN and obesity as well as the clinical finding of peripheral retinal hemorrhages.

REFERENCES

Adding members to the diabetes team (possibly within your optometry clinic) including but not limited to certified diabetes educators and behavioral health specialists—both of whom can be an integral part of the optometry practice team as patients with these services face less stigma and have easier access to appropriate comprehensive diabetes care.

Advanced technologies intersecting optometry and the care of patients with or at risk of diabetes and diabetic eye disease (such as spectral domain optical coherence tomography [SD-OCT], OCT angiography, nerve fiber analysis [GDx])

Support and collaboration from all optometry-aligned sectors (housing, banking, public health, emergency preparedness, environmental) united to a triple bottom line approach that includes health, economy, and environment.

Past success

Although optometry had been participating in the care of patients with diabetes since 1971, the profession was not fully recognized as being “official diabetes care providers” until the Diabetes Care Supplement published by the American Diabetes Association (ADA) in January 1995. This publication reset diabetes clinical care recommendations that all providers follow, recommending that “comprehensive dilated eye and visual examinations should be performed annually by an ophthalmologist or optometrist.”

This was the very first time the reference “ophthalmologist or optometrist” was used in ADA Clinical Practice Recommendations.

Furthermore, growing U.S. diabetes rates in the 1980s brought new attention to diabetes by the Centers for Disease Control (CDC), which established the CDC Division of Diabetes Translation (DIT) in the 1990s.

Combined with the American Optometric Association’s (AOA) advocacy efforts and new ADA clinical care recommendations, optometry’s place in interprofessional diabetes care was solidified by the CDC/DTT through the establishment of the integrative diabetes practice model, Pharmacy, Podiatry, Optometry and Dentistry (PPOD), in 1999 and the publication Improving the Nation’s Vision Health: A Coordinated Public Health Approach in 2006.

The CDC, in its most recent diabetes report card (2017) reports that 61.6 percent of American adults with diagnosed diabetes received a dilated eye exam from 2014-2015, adding, “The only recommended practice that consistently met or exceeded the Healthy People 2020 target was the dilated eye exam.”

By many accounts, optometry has traveled far and performed well. ADA’s January 2019 Diabetes Care practice guidelines still reinforces: “Patients with type 1 diabetes should have an initial dilated and comprehensive eye examination within 5 years after the onset of diabetes. Patients with type 2 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist at the time of diagnosis.”

Markers indicating course correction

Optometry’s current position requires a closer look at the data. In fact, the percentage of adults diagnosed with diabetes who had contact with an eye doctor (optometrist or ophthalmologist) during the past 12 months increased with age. This trend may be consistent with a prevention focus on the Medicare population, perhaps by clinicians and the Medicare program itself.

National data indicate a recent increase in diabetes complications is most apparent in young adults (aged 18 to 44 years) and middle-aged adults (aged 45 to 64 years). Optometry aiming its sights toward lower age groups may be in order. For example, among adults age 18 to 39 who had diabetes, only 35.9 percent reported...
Diabetes treatment
Continued from page 27

contact with an eye doctor in the past 12 months. The CDC (2017) estimates 7.2 million adults have diabetes but were not aware they have the disease or did not report they have it and that 84.1 million people have prediabetes.

These 91.3 million Americans can directly benefit from comprehensive eye examination which can uncover undiagnosed disease. Retinopathy can present itself as an initial indication of overt type 2 diabetes mellitus (T2DM) and other ocular findings (cataract, glaucoma, ocular surface diseases, papillopathy) have been associated with hyperglycemia.

Additionally, data shows the group with the highest increase of T2DM was children. Importantly, youth-onset type 2 diabetes displays unique aspects, such as rapidly progressive β-cell decline and accelerated development of diabetes complications.

This increase of T2DM among children is thought to be due to increased screen time, sedentary lifestyle, and higher rates of obesity. Because children suffer higher rates of myopia (another epidemic), optometry is perfectly poised to accommodate assisting early diagnosis of both diseases during the comprehensive eye examination.

Optometry’s diabetes information comes from several sources:

- ADA
- Diabetes Advocacy Alliance (DAA)
- U.S. Congressional Caucus on Diabetes
- AOA Health Policy Institute (HPI)

Combined, these four sources can inform optometry of impending threats and opportunities. For example, an opportunity came in November 2018 with the start of an ADA multi-year campaign to reduce therapeutic inertia (clinician failure to initiate or intensify treatment) in the management of type 1 and type 2 diabetes. AOA was one of 100 organizational members—and the only eyecare provider group—of the diabetes ecosystem assembled for the opening ADA Therapeutic Inertia Summit.

Optometry has a role to play in this ADA campaign as the summit outcomes inform the profession’s course. They reveal:

- Unacceptable levels of diabetes morbidity and mortality, especially with respect to T2DM
- Intensive treatment leads to better microvascular status (37 percent for microvascular complications such as retinopathy)
- At the time of T2DM diagnosis, 87 percent of individuals will have another disease
- Time and treatment barriers (6.9 percent inad

regulations—and its actions can change often.

Finally, HPI offers research and analysis focused on eye health and vision care with policy briefs that often intersect with diabetes care.

Optometry’s future in diabetes care
Simply put, optometry will move beyond retinopathy. Optometry will play a greater role in assisting patients’ glycemic control, their attainment of suitable body mass index, reduction of behavioral and cardiovascular risk factors, and avoidance of progressive retinopathy, diabetic macular edema, glaucoma, cataract, neuropathies, and nephropathy.

Doctors of optometry must be resolute with the knowledge optometry’s course is not constrained by diabetes; rather, diabetes is contained within the navigable waters optometry can sail.

BY THE NUMBERS

$404 Billion
FOR DIAGNOSED DIABETES PER CASE

$13,240

FOR GESTATIONAL DIABETES PER CASE

$5,800

FOR UNDIAGNOSED DIABETES PER CASE

$4,250

HIDDEN “TAX” AVERAGING PER AMERICAN

$1,240

FOR PREDIABETES PER CASE

$500


REFERENCES


JUNE 2019
The Economic Burden Associated with All Diabetes $404 Billion in 2017

$327.2 Billion Diagnosed Diabetes
$31.7 Billion Undiagnosed Diabetes
$43.4 Billion Prediabetes
$1.6 Billion Gestational Diabetes

Roberto Cavalli debuts latest spring/summer collection

GEOMETRIC SHAPES and elements characterize the new spring/summer 2019 collection of sunglasses and eyeglasses by Roberto Cavalli. The snake, a familiar symbol in the company’s eyewear and clothing categories, is seen on the front of the collection’s frames and temples.

**EYEGLASS COLLECTION**

RC5089 features a square-shaped model with an acetate front. A metal snake pattern is wrapped around the temples.

RC5083 exhibits a square-shaped model in thin metal. Acetate temple tips feature a monogram logo and snake pattern.

RC5093 features a metal rim and acetate front. Metal temples feature the brand’s signature snake pattern.
**SUNGLASS COLLECTION**

<table>
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<tr>
<th>TB1643</th>
<th>features a pilot shape crafted in stainless steel with acetate temples. The front is available in a shiny finish of black, gunmetal, or gold and includes two perforated lines above the bridge. A metal plaque with an engraved logo is featured along the temples.</th>
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<td>TB1642</td>
<td>is designed in acetate with an accent of metal detailing above the bridge along with the brand logo laser-engraved on a metal plaque along the temples. This style is available in black, clear, or tortoise in a shiny finish.</td>
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**Timberland introduces City Force spring eyewear collection**

Timberland introduces the new City Force capsule eyewear collection featuring oversized navigator and pilot silhouettes crafted in stainless steel and acetate. The new styles feature a City Force soft pouch case, offered in black with a white silk-screened Timberland logo.

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<th>RC1112</th>
<th>(available in September 2019) showcases a cat-eye silhouette in acetate. Thin metal temples feature a snake pattern in shiny gold colorations.</th>
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<td>RC1135</td>
<td>features a women’s mask-style sunglass frame with a full-lens front and metal details characterized by the brand’s signature snake pattern. Thick acetate temples include a metal monogram logo and charms.</td>
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Timberland
Continued from page 31

TB1645 creates a double bridge.
This style is offered in stainless steel and features temples accented by a pressed logo with a color-fill.

TB1646 features thick rims crafted in acetate. A shiny finish of black or tortoise is highlighted by a double gold metal accent above the nose bridge. The frame’s acetate temples include a gold metal plaque with a laser-engraved logo.

TB1644 showcases an acetate front in shiny colorations of black, clear, and tortoise. The frame’s temples are offered in a shiny/matte combination of gold and highlighted by a pressed logo with a black color-fill.

The open metal detailing of TB1645 creates a double bridge. This style is offered in stainless steel and features temples accented by a pressed logo with a color-fill.
Kenneth Cole introduces new eyewear styles in celebration of Pride Month

IN HONOR OF PRIDE MONTH, Kenneth Cole is releasing new optical sunglass styles to its Kenneth Cole New York Spring/Summer eyewear collection. The 2019 Pride eyewear styles are highlighted by the LGBTQ+ Pride rainbow flag with additional black and brown stripes.

**KC7239** is part of the Techni–Cole collection and features polarized lenses with an anti-reflective coating. The Pride stripe highlights the corners of the frame’s front, available in satin black with shiny black horn over shiny grey tortoise temples.

**KC0293** features wood-textured temples. The frame’s front is double laminated and available in shiny black over milky classic tortoise, accented by the Pride stripe accent on the inside of the bridge.

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Jennifer Coyle, OD, MS, FAAO  Dean of Pacific University College of Optometry

Contact lenses, academia & leadership, a good sandwich

Why contact lenses? When I came to optometry school, I assumed I was going back to Alaska to a private practice I worked in after high school and perhaps specialize in pediatrics. In my second year of optometry school in the second week of my basic contact lens course, I was just inspired. I became fascinated with the idea that you put this little piece of plastic in the eye and you can see. [Laughs] I had been transformed by contact lenses as a teenager. My mentor Cristina Schnider was very inspirational. It completely changed my career path. I stayed in academia, completed a contact lens residency, and was involved with research because there were questions I wanted to answer. It’s life-changing for people.

What keeps you engaged in teaching? The students, the opportunity, and the profession. Every day we do something new and encounter a new scenario. I’m in an extremely dynamic environment with people so dedicated to education, optometry, and science. Things are always happening, and there’s always a new challenge. I get to meet new people every day and make connections. Now I’m at the point in my career where I’m not the one who is trying to figure it out—I’m the one who is trying to help others figure out where they want to go and what they want to do. Mentorship and leadership have become important to me. It can’t replace my love of contact lenses, but it’s a close second.

Why stay in private practice? I practiced for 12 years in a multi-doctor group practice. But when I became an administrator, I realized after I tried to do it all that you can’t always do it all. I had to pick. One of the hardest days of my life was the last day of practice and saying goodbye to my patients and the staff. [Laughs]

What do you advise students entering optometry school? Be open-minded. Always be thinking about goals and making choices that set you up for success. At graduation, after you put their hood on them and shake their hands, I usually whisper in their ears, “Now go find your bliss.” My advice to students is to set them up for success as early as possible. Find mentors, explore something that scares you, especially an area you don’t know a lot about. Build up experiences so after graduation you enter the mode of practice that makes you excited about getting up everyday and taking care of patients.

What’s your favorite city? I love Paris. Paris is such an amazing city because of the history, the culture, and the food. I like the challenge of people speaking French to me, and I’m trying to get by on my high school and freshmen-level college French.

What is your guilty pleasure food? If I could eat a sandwich everyday, I would. [Laughs] I think for the last 20 years bread and fat have gotten a bad rap. My guilty food is a really good sandwich. Something with lots of vegetables, turkey, and avocados. Anything with an avocado on, I’m down for. [Laughs]

Do you have any regrets? I’m sure we all do. When you take risks and try new things, you can’t live your life looking for regrets. I just don’t have time for that. I wish I learned in my younger years what Dr. Linda Casser calls the art of marinade: gather information and let it sit for a little bit. Sometimes all you need is a good night’s sleep and 24 hours to wake up with a fresh perspective. Usually your gut tells you. I wish I’d followed my gut more in the past.

How should optometry move forward? We need not only to hone our skills as practitioners but to embrace inter-cultural communication as the diversity of our nation changes and to think about how patients are going to relax around us so that they can relax about seeking eye care from us. We are better diagnosticians because we have so much technology at our fingertips. My hope is that we can discard the fear and embrace it in a way to make us better. We need to remember that there are areas of expertise that technology is not going to replace—communication with the patient, knowledge of optics and binocular vision, and taking care of children. We have a ton going for us. Technology can make us even better.

What’s the craziest thing you’ve ever done? The scariest thing I’ve ever done, I emceed the banquet for the American Academy of Optometry new Fellows. You stand in front of 800 people trying to be funny and not to trip over your own tongue. [Laughs] I did it twice. I get very nervous anytime I speak, so to me that was crazy because it was pushing my limit. —Vernon Trollinger
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Consult the Full Prescribing Information for complete product information.

INDICATIONS AND USAGE
Xiidra® (lifitegrast ophthalmic solution) 5% is indicated for the treatment of the signs and symptoms of dry eye disease (DED).

DOSE AND ADMINISTRATION
Instill one drop of Xiidra twice daily (approximately 12 hours apart) into each eye using a single-use container. Discard the single-use container immediately after using in each eye. Contact lenses should be removed prior to the administration of Xiidra and may be reinserted 15 minutes following administration.

CONTRAINDICATIONS
Xiidra is contraindicated in patients with known hypersensitivity to lifitegrast or to any of the other ingredients in the formulation.

ADVERSE REACTIONS
Clinical Trials Experience
Because clinical studies are conducted under widely varying conditions, adverse reaction rates observed in clinical studies of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice. In five clinical studies of dry eye disease conducted with lifitegrast ophthalmic solution, 1401 patients received at least 1 dose of lifitegrast (1287 of which received lifitegrast 5%). The majority of patients (84%) had ≤3 months of treatment exposure. 170 patients were exposed to lifitegrast for approximately 12 months. The majority of the treated patients were female (77%). The most common adverse reactions reported in 5-25% of patients were instillation site irritation, dysgeusia and reduced visual acuity. Other adverse reactions reported in 1% to 5% of the patients were blurred vision, conjunctival hyperemia, eye irritation, headache, increased lacrimation, eye discharge, eye discomfort, eye pruritus and sinusitis.

Postmarketing Experience
The following adverse reactions have been identified during postapproval use of Xiidra. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

Rare cases of hypersensitivity, including anaphylactic reaction, bronchospasm, respiratory distress, pharyngeal edema, swollen tongue, and urticaria have been reported. Eye swelling and rash have been reported.

USE IN SPECIFIC POPULATIONS
Pregnancy
There are no available data on Xiidra use in pregnant women to inform any drug-associated risks. Intravenous (IV) administration of lifitegrast to pregnant rats, from pre-mating through gestation day 17, did not produce teratogenicity at clinically relevant systemic exposures. Intravenous administration of lifitegrast to pregnant rabbits during organogenesis produced an increased incidence of omphalocele at the lowest dose tested, 3 mg/kg/day (400-fold the human plasma exposure at the recommended human ophthalmic dose [RHOD], based on the area under the curve [AUC] level). Since human systemic exposure to lifitegrast following ocular administration of Xiidra at the RHOD is low, the applicability of animal findings to the risk of Xiidra use in humans during pregnancy is unclear.

Animal Data
Lifitegrast administered daily by intravenous (IV) injection to rats, from pre-mating through gestation day 17, caused an increase in mean preimplantation loss and an increased incidence of several minor skeletal anomalies at 30 mg/kg/day, representing 5,400-fold the human plasma exposure at the RHOD of Xiidra, based on AUC. No teratogenicity was observed in the rat at 10 mg/kg/day (460-fold the human plasma exposure at the RHOD, based on AUC). In the rabbit, an increased incidence of omphalocele was observed at the lowest dose tested, 3 mg/kg/day (400-fold the human plasma exposure at the RHOD, based on AUC), when administered by IV injection daily from gestation days 7 through 19. A fetal No Observed Adverse Effect Level (NOAEL) was not identified in the rabbit.

Lactation
There are no data on the presence of lifitegrast in human milk, the effects on the breastfed infant, or the effects on milk production. However, systemic exposure to lifitegrast from ocular administration is low. The developmental and health benefits of breastfeeding should be considered, along with the mother’s clinical need for Xiidra and any potential adverse effects on the breastfed child from Xiidra.

Pediatric Use
Safety and efficacy in pediatric patients below the age of 17 years have not been established.

Geriatric Use
No overall differences in safety or effectiveness have been observed between elderly and younger adult patients.

NONCLINICAL TOXICOLOGY
Carcinogenesis, Mutagenesis, Impairment of Fertility
Carcinogenesis: Animal studies have not been conducted to determine the carcinogenic potential of lifitegrast.
Mutagenesis: Lifitegrast was not mutagenic in the in vitro Ames assay. Lifitegrast was not clastogenic in the in vivo mouse micronucleus assay. In an in vitro chromosomal aberration assay using mammalian cells (Chinese hamster ovary cells), lifitegrast was positive at the highest concentration tested, without metabolic activation.
Impairment of fertility: Lifitegrast administered at intravenous (IV) doses of up to 30 mg/kg/day (5400-fold the human plasma exposure at the recommended human ophthalmic dose [RHOD] of lifitegrast ophthalmic solution, 5%) had no effect on fertility and reproductive performance in male and female treated rats.

Manufactured for: Shire US Inc., 300 Shire Way, Lexington, MA 02421. For more information, go to www.Xiidra.com or call 1-800-828-2088. Marks designated ® and ™ are owned by Shire or an affiliated company. ©2018 Shire US Inc. SHIRE and the Shire Logo are trademarks or registered trademarks of Shire Pharmaceutical Holdings Ireland Limited or its affiliates. Patented: please see https://www.shire.com/legal-notice/product-patents Last Modified: 01/2018 S33769
THERE’S NO SUBSTITUTE

Xiidra is the only lymphocyte function-associated antigen-1 (LFA-1) antagonist treatment for Dry Eye Disease.¹ ²

Xiidra, the first in a class of LFA-1 antagonists for Dry Eye Disease, is a prescription eye drop FDA-approved to treat both signs and symptoms of the disease.¹ ³

There’s no substitute.² ⁴
Check out patient resources, insurance coverage, and more at Xiidra-ECP.com

References:
1. Xiidra [Prescribing Information]. Lexington, MA: Shire US.

Indication
Xiidra® (lifitegrast ophthalmic solution) 5% is indicated for the treatment of signs and symptoms of dry eye disease (DED).

Important Safety Information
Xiidra is contraindicated in patients with known hypersensitivity to lifitegrast or to any of the other ingredients.

In clinical trials, the most common adverse reactions reported in 5-25% of patients were instillation site irritation, dysgeusia and reduced visual acuity. Other adverse reactions reported in 1% to 5% of the patients were blurred vision, conjunctival hyperemia, eye irritation, headache, increased lacrimation, eye discharge, eye discomfort, eye pruritus and sinusitis.

To avoid the potential for eye injury or contamination of the solution, patients should not touch the tip of the single-use container to their eye or to any surface.

Contact lenses should be removed prior to the administration of Xiidra and may be reinserted 15 minutes following administration.

Safety and efficacy in pediatric patients below the age of 17 years have not been established.

For additional safety information, see accompanying Brief Summary of Safety Information on the adjacent page and Full Prescribing Information on Xiidra-ECP.com.

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