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When to refer patients with diabetic retinopathy

Imaging aids in differential diagnosis of uncommon disease

Know the link between cotton wool spot & anemia

Understanding bloodwork results helps to distinguish the diagnosis

Why doctors are rethinking AMD standards

By Jeffry Gerson, OD, FAAO

A group of educators and private practice clinicians developed practical, evidence-based guidelines that can be implemented in any eyecare practice to allow for better disease detection.

These ODs include myself; Glenn Corbin, OD; Steve Ferrucci, OD, FAAO; Paul Karpecki, OD, FAAO; Gary Kirman, OD; Kim Reed, OD, FAAO; and Laurie Sorrenson, OD, FAAO.

Beyond grading systems

When asked to explain the current standards in age-related macular degeneration (AMD) treatment and management, most primary-care optometrists will likely recite details of a grading system developed for epidemiological studies and clinical trials. These grading systems rely on careful inspection of three-field stereo-fundus photographs to grade the presence of drusen and/or pig.

See AMD standards on page 16

6 steps to manage cataract patient expectations

By Marc R. Bloomenstein, OD, FAAO

Colleagues have reminded me that what ODs tell their patients prior to surgery is going to be an expectation, and things that happen after the procedure that are not discussed are considered complications.

That has profound implications on both the psyche of the refractive surgical patient and all the doctors and staff who are managing the patient’s procedure.

It seems as though most optometrists leave the heavy lifting, or difficult discussions, for the surgical center; this in fact is a critical step in the refractive surgical procedure that

See Cataract expectations on page 11

By Vin T. Dang, OD, FAAO

The most common differential diagnoses for cotton wool spot (CWS) are diabetes, hypertension, or even hepatitis C. What if I told you a cotton wool spot found during an annual comprehensive exam on an otherwise healthy 54-year-old female may have lead to a life-saving diagnosis? This case study will review the pathophysiology of a CWS and what an optometrist should consider to diagnose and manage these patients in their clinic.

Case presentation

On April 3, 2017, R.M., a 54-year-old female, presented for her annual exam. Entering unaided visual acuity was 20/20 in both eyes.

A careful review of systems indicated no health concerns, and the patient was on a holistic medication regimen of calcium and fish oil supplements. Furthermore, extraocular muscles were full in all fields without pain, and pupils were equal and normal with no afferent pupil defect noted.

See Cotton wool spot on page 12
SOLUTIONS

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Dialogue with lecturers at CE

By Benjamin P. Casella, OD, FAAO
Chief Optometric Editor
Practices in Augusta, GA, with his father in his grandfather’s practice

Last month, I had the opportunity to lecture alongside my friend and fellow Optometry Times Editorial Advisory Board member Michael Chaglasian, OD, FAAO. We presented a two-hour glaucoma update to fellow doctors of optometry at SUNY’s Envision Conference in New York City.

I spoke on the structure-function relationship in glaucoma with respect to newer diagnostic devices and progression algorithm software as well as pressure-independent risk factors.

Dr. Chaglasian spoke on tonometry with respect to standards of care and newer devices—both for measurement in-office and at home—and contemporary means of determining the presence or absence of progression in glaucoma.

One aspect of this lecture that really stood out to me was the fact that we had questions—great questions—from the audience.

**Audience questions**

One person picked Dr. Chaglasian’s brain regarding newer non-contact tonometry devices, and his questions opened up into a great conversation about how we check intraocular pressure (IOP) on glaucoma patients for whom Goldmann tonometry is not possible.

Another member of the audience brought up that he had several patients with sleep apnea who also had retinal nerve fiber layer defects. This led to great dialogue concerning risk factors for glaucoma other than ocular hypertension.

I don’t know that it was just an engaging presentation on our part. For whatever reason, however, the audience engagement was fantastic, and those two hours were as much of a conversational nature to a lecture as I have experienced as a speaker.

In a solo lecture later that same day, I was going over why it’s not a good idea to taper oral antibiotics, and my questions opened up into a great conversation about drug resistance, and an audience member asked me why we may slowly taper doxycycline when treating meibomian gland dysfunction (MGD) if we’re not supposed to taper oral antibiotics.

In the years that I have given that lecture, I have never had that question come up before. It gave me the opportunity to verbally hash through the answer and to explain that this modality of treating MGD is not geared toward killing bacteria but rather toward making use of a different property of tetracyclines.

I’d never really thought that particular question through, and I’m glad someone gave me the opportunity to do that.

So, please continue to ask lecturers questions and challenge us.

Many of the most productive lectures I have been a part of, both as a speaker and an audience member, have been conversational in nature. Those speaking and those listening should both embrace that concept.

Discourse, dialogue, challenge, and argumentation are all good things because they exemplify why we don’t simply do optometry—we practice it.

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Chief Optometric Editor
ODS PROTEST UNIVERSITY NAME CHANGE


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5 reasons to recommend hydrogen peroxide lens care to your patients

BY JESSICA CROOKER, OD
Scituate, MA

Hydrogen peroxide (H₂O₂) lens care systems can provide cleaner and more comfortable contact lens wear to your patients. Aren’t convinced? Check out these five reasons why H₂O₂ should move to the top of your lens care recommendation list.

1. **H₂O₂ is efficacious against bacterial and fungal biofilms** and *Acanthamoeba*. H₂O₂ use has been associated with lower corneal infiltrative event rates and a lower risk of *Acanthamoeba* keratitis than multi-purpose solutions (MPS).

2. **H₂O₂ lens care systems are preservative-free and do not uptake preservatives into lenses.** H₂O₂ causes minimal to no corneal staining and is compatible with and approved for use with all contact lens materials.

3. **Surfactants and wetting agents used in certain H₂O₂ systems enhance comfort by keeping lenses free of deposits and maintaining surface moisture.**

4. **“One-step” H₂O₂ lens care systems promote ease of use by combining disinfection and neutralization into a single step and the visible bubbling allows users to “see” the process.**

5. **When compared to MPS users, patients using H₂O₂ lens care demonstrate better overall compliance with directions for use and higher rates of compliant lens care behaviors.**

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**REFERENCES**


When to refer patients with diabetic retinopathy

Patients with diabetic retinopathy (DR) or diabetic macular edema need to be referred when eye-specific treatment is indicated, necessary, or should be considered by a retinal specialist.

The referral should be based on standards of care and/or clinical practice guidelines for the management and treatment of diabetes-related eye disease. Multiple clinical practice guidelines exist.1-4 These guidelines focus on referral and treatment of vision-threatening DR; that is, proliferative diabetic retinopathy (PDR) and center-involved DME.

Additionally, the Early Treatment Diabetic Retinopathy Study (ETDRS) suggested benefits of pan-retinal photocoagulation (PRP) not only in patients with PDR, but also for patients having type 2 diabetes and severe non-proliferative diabetic retinopathy (NPDR), as well as macular laser for those with clinically significant macular edema (CSME) per specific ETDRS criteria.5

Intravitreal injection of anti-VEGF therapy (AVT) for CI-DME has become the gold standard because it results in visual and anatomical outcomes superior to laser based on multiple clinical trials. However, it has not yet become the standard for treatment of either NPDR or PDR.6

Large prospective trials have shown that earlier intervention with AVT in NPDR can not only stabilize, but also results in disease regression for a significant percentage of patients with less severe disease, as well as lower the risk of developing PDR or CI-DME.7 Anti-VEGF has been shown to be non-inferior to PRP for treating PDR.8

**FDA approval**

In 2017, ranibizumab (Lucentis, Genentech) received FDA approval for the treatment of any level of DR with or without the presence of DME, and aflibercept (Eylea, Regeneron) is expected to receive such approval in the near future.

The data for both ranibizumab and aflibercept show that significantly more patients with moderately severe or worse NPDR have at least a two-step improvement in Diabetic Retinopathy Severity Scale (DRSS) when given AVT, and that these patients are far less likely to develop a sight-threatening disease.

When should an OD refer any specific patient to a retinal specialist?

Diabetes duration and metabolic control modulate individualized risk and may prompt an earlier referral for some patients.

Evidence shows that some patients are more likely to be lost to follow-up based on specific characteristics—socioeconomic class, level of education, and age—and referring ODs might want to transfer care earlier rather than later.9

Different retinal specialists have different criteria for treatment based on their own clinical experience and may or may not use AVT in the absence of DME.

Some retinal findings can be hard to visualize based on patient cooperation, ODs’ instrumentation, and clarity of the ocular media.

**When to refer**

ODs should refer patients when they are no longer comfortable managing specific cases of diabetes and/or diabetic retinopathy.

Given this, it makes sense to refer patients who have moderately severe or worse in the “vicinity” of ETDRS severity level 47 or worse: multiple intra-retinal hemorrhages in two or more quadrants, any definite vein beading, any prominent IRMA—especially if a disease progression via serial fundus photography is detected.

A local retina specialist should be consulted to ascertain their referral and treatment preferences as well as to facilitate informed conversation with patients based on reasonable expectations.

If a patient has glycosylated hemoglobin > 8 percent, and especially if they have an initial and/or long-term history of poor glycemic control, consider earlier referral.

This should also be done if patients aren’t getting regular diabetes and eye care, are monocular/have amblyopia, or have anxiety or depression.

Dilate patients with diabetes and use technology to detect abnormalities that
might be missed with conventional fundus examination techniques: serial fundus imaging and ultra-widefield imaging using red-free and fundus autofluorescence (see Figure 1).

Use optical coherence tomography (OCT) to detect sub-clinical DME and inner retinal thinning (retinal diabetic neuropathy) and OCT-A to detect non-perfusion, sub-clinical microaneurysms and other capillary abnormalities.

**Bottom line**

ODs should refer patients who they believe would benefit from treatment now or in the near future in collaboration with a local retinal specialist.

The paradigm for treatment and management of diabetic retinopathy is changing. The new standard is shifting toward treatments that not only prevent severe vision loss late in the game but lessen disease severity early.

**REFERENCES**


| dr.chous@diabeticeyes.com |
How hyperopes differ from myopes

This patient population is interested in knowing treatment options

My mother’s prescription was +6.00-3.00 x 178 or so in each eye prior to her cataract surgery, and my 20-year-old daughter’s prescription is +5.75-2.50 x 07. Aren’t genetics grand?

Both started wearing glasses around the age of 4, with my daughter’s refractive error confirmed when we first installed a WaveScan WaveFront System (VisX/AMO) at the laser center.

When I say hyperopes are “different,” I say it with love and affection as well as with professional knowledge.

Let’s discuss the “how” and “why” of hyperopes being different and what their options are for refractive procedures.

Explaining hyperopes

When a patient’s hyperopia gets above +2.00 D or so, ODs need to think about how it will affect the patient’s glasses and/or contact lenses. We all know a plus lens is thicker in the center and thinner in the periphery.

Proper frame selection and ophthalmic lens materials have become important to achieve acceptable cosmesis.

Why is it that a +6.00 D hyperope is attracted to the largest frame on an OD’s board?

Similarly, contact lenses are thicker in the center. So a hyperope’s contact lens is harder to handle and harder to apply and transmits less oxygen to the cornea.

Additionally, without correction, many hyperopes cannot see their fingers clearly to apply the lens and need some type of correction just to start the process.

Examining the literature

Hyperopes are different in other ways as well. Results from a vocational interest survey study of 140 male students found that 76 percent reported a likelihood of predicting myopia versus hyperopia. Hyperopes were more interested in business skills and selling but also less likely to become officers.

Another study of 152 military recruits found hyperopes significantly vary from myopes in weight and heart rate variability. Hyperopes weighed more and had a lower heart rate variability (HRV).

A low heart has been associated with a poorer ability to adapt to stress. The Framingham Heart Study found poorer cardiovascular function in patients with low HRV.

Finally, a study of 782 incoming students at Washington State University—which included females—found certain personality differences, with hyperopes more extroverted than myopes. Hyperopes are different.

Laser vision correction

Hyperopes are also different as it relates to laser vision correction. As lasers improve, the first U.S. Food & Drug Administration (FDA) approvals are almost always for myopes.

This is partly because the market is much larger but also because the treatment is different. A hyperopic treatment removes tissue in the mid-periphery that can blend out to 9 mm, making the cornea relatively steeper and increasing the power of the cornea.

Hyperopic treatments result in a more prolate cornea while also having a smaller effective optic zone

Hyperopic treatments are typically longer and, with early lasers, could take up to one minute of lasering time. Such lengths lead to varying treatments and varying healing with the result and poorer outcomes as measured by patients achieving uncorrected vision of 20/20.

Hyperopic treatments differ from myopic treatments both optically and physiologically. Hyperopic treatments result in a more prolate cornea while also having a smaller effective optic zone.

These treatments have a larger angle kappa, and this emphasizes the importance of properly centering the treatment.

Then comes the debate of where to center the treatment: pupil center, corneal apex, visual axis or somewhere in between.

Studies trend toward centering the treatment over the visual axis. Critical to centering the treatment is having a laser that can track the cornea accurately.

Ocular surface

The treatment for hyperopic patients takes place in the mid-periphery blending out to the periphery.

This damages more corneal nerves and results in patients having more challenges with their ocular surfaces after procedures.

It is also important that ODs carefully examine hyperopic patient pre-operatively for ocular surface disease and meibomian gland dysfunction.

Also, look for concomitant risk factors for dry eye such as gender, age, smoking, and medications.

Addressing and treating the condition prior to surgery can be more effective than trying to play “catch-up” after surgery

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trying to play “catch-up” after surgery. Treatments can include artificial tears, prescription medicines such as liftegrast (Xiidra, Shire) and/or cyclosporine (Restasis, Allergan; Cequa, Sun Pharma), lid scrubs and meibomian gland treatments such as iLUX (Tear Film Innovations) or LipiFlow (Johnson & Johnson Vision). Treatments can continue after surgery.

Results
Long-term results for hyperopic treatments appear less stable than those of myopic patients. There are two proposed mechanisms for the regression that is seen with hyperopic treatments.

First is latent hyperopia not detected pre-operatively. Therefore, it is important to obtain an accurate cycloplegic refraction, typically using cyclopentolate (Cyclogyl, Alcon).

If there is a significant difference in sphere power between the manifest refraction and the cycloplegic refraction, delaying or postponing surgery is an option to consider.

Often when the full cycloplegic refraction is treated, post-operatively the eye tries to maintain its altered accommodative state, resulting in post-operative pseudo-myopia.

Secondly, hyperopic treatments can show a progressive change in the corneal curvature and decrease in corneal power. Studies have look at causes for this increase in regression.

A 2005 study concluded, “Less predictable biomechanical changes from the circumferential release of tension on collagen bundles after midperipheral hyperopic ablation and greater variation in beam centration and the angle of incidence peripicaic ablation and greater variation in lagen bundles after midperipheral hy-circumferential release of tension on col-

Results showed regression over the first five years post-surgery and limited regres-sion up to 16 years after.”

Current methods
Today, the excimer laser operates at a much higher rate than in years ago, and treatment times for hyperopes are as short as ever. Ablation patterns continue to evolve to limit regression and maintain optical quality.

Methods to modulate and measure epitherm pallation are in development, which have shown more stable hyperopic treatments. Nevertheless, it is important to remember hyperopes are different.

REFERENCES

Dr. Owen has served as the president of the Optometric Cornea, Cataract and Refractive Society (ODCRS) and sits on its board of directors. He participates in clinical research and lectures on laser vision correction, cataract surgery, dry eye, and contact lenses.

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MAKING LENS CARE EASY

CLEAR CARE® PLUS IS A CLEAR CHOICE FOR PATIENTS AND PRACTICES

Christopher Lievens, OD, MS, FAAO
Chief, Internal Clinics, The Eye Center Professor, Southern College of Optometry
Memphis, TN

Dr. Lievens was compensated by Alcon for his participation in this advertorial.

An excellent way for eye care professionals to improve their practice’s performance is by helping more patients become successful contact lens wearers. Because of their convenience and benefits over conventional lenses, daily disposable lenses are typically my first choice, but I also have patients whose lifestyle needs are best addressed with monthly replacement lenses. I just recently met with such a patient. In addition to prescribing the right lenses for her individual needs, my advice was that she use CLEAR CARE® PLUS for her daily lens care. She had been using multi-purpose contact lens solutions (MPS), so when I introduced CLEAR CARE® PLUS, her question was: “How can it help me?” I explained that CLEAR CARE® PLUS provides excellent disinfection, features Alcon’s HydraGlyde® Moisture Matrix to support outstanding lens-wearing comfort, and best of all, makes lens care easy.

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2 Place lenses in baskets and rinse for 5 seconds with solution
3 Fill the lens case to the line with solution
4 Put it all together and tighten the lid
5 Soak overnight or for at least 6 hours

When I recommend CLEAR CARE® PLUS to my patients, I always take a few minutes to show them the solution bottle and case, and walk them through the five simple steps for use. Consider employing the “How to Use CLEAR CARE® PLUS” video and Patient Tip Card with coupon. Patients appreciate having these available to them, whether they need a quick refresher, or want to spread the word!

View this video at https://youtu.be/mMGF7D0_kx0

Using CLEAR CARE® PLUS only takes a few simple steps. As I walked my patient through the process, her growing enthusiasm was obvious. One key attribute of CLEAR CARE® PLUS is that users do not need to rub their lenses prior to disinfection. As many of us often see in practice, studies show that the rub step required when cleaning lenses with MPS is frequently skipped, so being able to offer lens care that does not require rubbing is a big opportunity for eye care professionals looking to simplify lens care for patients. In addition, CLEAR CARE® PLUS provides a visual cue — the bubbling action — that serves as a helpful reminder to patients. Users know that they will only see the bubbles if they use fresh solution every time they disinfect their lenses (minimum recommended disinfection time is 6 hours) and replace their case at the recommended interval.

In light of these differences, it is not surprising that comparative studies show that peroxide-based disinfection provides a significant compliance advantage over MPS. This includes better overall compliance with directions for use, as well as reductions in specific non-compliant behaviors: a 4x lower likelihood of reusing (“topping off”) solution and a 7x lower likelihood of using lens cases beyond three months. On top of that, in a survey of habitual MPS users who tried CLEAR CARE® PLUS for 21 days, 93% of participants said that they found it easy to clean their lenses with CLEAR CARE® PLUS. If lens care is easy, patients will be more compliant — and that is attractive to all eye care professionals!

Taking advantage of every opportunity to satisfy patients is a critical part of building and maintaining practice success. As more patients who wear monthly replacement lenses have become happy CLEAR CARE® PLUS users, the less I find myself reminding them about the importance of lens care compliance or managing issues related to non-compliance. This has helped me dedicate more time to providing the best comprehensive vision care for my patients’ needs. For patients who wear monthly replacement contact lenses, the choice is simple. Not only does CLEAR CARE® PLUS make lens care easy and support compliance, but it also provides excellent disinfection efficacy and supports comfortable lens wear, making it an optimal lens care option for patients and for practices.

References

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Sponsored by Alcon
Know when to delegate testing responsibilities

ODs need to determine which glaucoma tasks to perform or assign to staff.

Over the years I have read numerous articles concerning the merits—specifically those of more efficient time management—of optometrists delegating more and more tasks to para-professionals, technicians, and scribes.

In my practice
In our two-doctor practice—the other doctor being my father—with our relatively well cross-trained employees, we see patients after they have gone through a preliminary history, visual acuity testing, auto-refraction, and non-contact tonometry.

I think we’re doing things proficiently, considering my grandfather used to bring a patient back to his exam room, perform a refraction—an examination that would have been considered cursory by today’s standards (this was in the ’40s)—and then bring the patient over to a small table to sell him a pair of glasses with no help.

Through conversations with colleagues, I know our practice is somewhere in the middle of the pack as far as delegating the performance of some examination elements to staff.

For example, I know an OD in north Georgia who does everything from patient history to the completion of the examination himself, and I know another doctor in Alabama who doesn’t see the patient until he is dilated.

It essentially comes down to one’s comfort level, which is not always accurately predicted by how long one has been in practice—the OD who does everything himself is younger than the doctor who doesn’t see the patient until he is dilated.

Because about half of my day is spent specifically with glaucoma patients, I will share my typical modus operandi for which glaucoma tests I delegate and which ones I perform myself.

Task delegation
Preliminary history is performed by one of our technicians. I call it “preliminary” because I was taught throughout my didactic training that patient history never ends until the completion of the exam. The same technician also performs visual acuity testing.

Pupil testing, which is performed during all patient encounters, is performed by me personally. If a patient with uncontrolled glaucoma develops a new afferent pupil defect, I want to know that. Not every afferent pupil defect is an easy-to-see grade 4.

Threshold visual field studies are conducted by one of our technicians.

However, if a visual field is technically unreliable but reliable enough to plot a blind spot, I consider the field of use from a qualitative standpoint.

I can get a feel for the patient’s field of vision even though the test may not fit neatly into a progression algorithm. In my practice, initial visual field studies showing defects are always repeated later, even if the initial visual field study is reliable.

We handle spectral domain optical coherence tomography (SD-OCT) the same way because looking at the printout will tell the clinician whether a scan is reliable. However, like visual field studies, even scans with low signal strengths can give qualitative information to the astute observer.

Testing yourself
I personally perform gonioscopy, and it is a test one perhaps not performed as often as it should be, in general.

I personally perform tonometry—by means of applanation tonometry or rebound tonometry if I am unable to applanate—on all my glaucoma patients and glaucoma suspects. I am aware that I may differ from other doctors in that thinking, but I’ve seen several scenarios in which patients’ intraocular pressures (IOPs) have increased from squeezing their eyelids during the test or simply being too apprehensive to relax and breathe.

Several landmark studies that guide how glaucoma should be treated have addressed how low target IOPs should be set. Just a point or two mm Hg has the potential to matter a great deal.

Another test I always perform myself is corneal pachymetry. The Ocular Hypertension Treatment Study (OHTS) taught us that a thin central corneal thickness is an independent risk factor for the development of glaucoma.

However, the cornea measuring only about a centimeter in diameter means there is little room for error. Not measuring in the center of the cornea can lead to invalid values that can have tangible effects on glaucoma management.

There exists no metric for ensuring the central cornea has been assessed by a pachymeter. It’s just something I must know for myself.

Finally, I review the patient’s treatment plan myself. While I have the utmost confidence in my staff, I think the patient may feel more compelled to be compliant if a treatment plan comes from me.

Further, if a patient has a question about why he is being treated (or monitored without treatment), I can explain on the spot by using landmark studies.

There is more than one correct way to handle glaucoma encounters. This is how I prefer handling these patient encounters, and I’m interested in how you handle yours.

REFERENCES
6 steps to manage cataract patient expectations

Continued from page 1

ODs prep patients

Allow me to make some assumptions to further justify my belief that ODs, the primary eye care profession, are in fact preparing our patients for surgery.

Furthermore, when I speak of refractive surgery I am including cataract surgery, which in 2018 is more a refractive surgery than it is a medical procedure.

There is an inherent inner dialogue that ODs process prior to any “refractive” decision initiated with patients. If a patient is interested in not wearing anything to correct their vision, they may think that their ability to see their flies or the intricacy work in making the flies is the refractive posture they would like to have.

ODs know they can minimize the sequelae and intermediate and may be limited for very near tasks.

ODs also know the patients will experience some form of glare and halos at night. Thus, knowing which is more important for the patient—night tasks or close vision—can help ODs negotiate the risk-benefit to achieve a maximum result.

Really listening to what the patient wants is not only the starting point but the foundation for making any other treatment recommendation.

Time should be spent elucidating the reasons why a procedure or lens option is not a good idea so that the patient can fully appreciate their own reality.

We live in a time where most patients know someone who had a procedure, and their tales of amazement can often be exaggerated. Therefore, when looking at their options, ODs should take everything into consideration.

For example, patients who work at a computer all day but are avid fly-fishermen may think that their ability to see their flies or the intricate work in making the flies is the refractive posture they would like to have.

Thus, working at a computer with spectacle correction is less important than seeing their handiwork.

Really listening to what the patient wants is not only the starting point but the foundation for making any other treatment recommendation.

STEP 1 Communication

ODs participate in this listening session every time they attempt to derive what is the impetus for their patients’ visits.

Crucial to this step is the ability to really listen to what patients are stating.

STEP 2 Fidelity

The next important thought is ensuring patients’ needs are met. Patients’ eyes may be limiting factors for their visual aspirations.

STEP 3 Broker

Eye doctors strive to give patients everything they think they need or want from their vision. They negotiate refractive distances and lens options to best accommodate their patients’ needs.

Implicit in this brokerage is that patients know where they gain and where they give up something. An example is with presbyopic-correcting IOLs. Some of the lenses are outstanding for distance needs glasses, desires contacts lenses, or is interested in not wearing anything to alleviate refractive posture, ODs speak of the risks, benefits, challenges, and opportunities for each patient.

With the “silver tsunami” engulfing practices, discussion regarding cataract treatment is now poised to be the most consistent discussion ODs have on a daily basis.

However, unlike glasses and contact lenses—which can be titrated—surgical patients need to have a more thorough evaluation of their wants and needs.

The management of patients’ expectations can be broken down into five steps:

STEP 4 Consensus

If the prior discussion points are achieved, then the agreement about how to proceed has already been consented.

Patients come for the acumen ODs possess and to use that experience to make the most prudent recommendations. I like to explain the course of action to patients and then have them repeat it back to me in their own words.

There have been instances where ODs believe what that their patients understand in which they are saying, only to have a family member call back and state the patient was confused or couldn’t articulate the next step.

STEP 5 Documentation

In real estate, it is all about “location, location, location;” for optometry, it is “document, document, document.”

Pre-printed forms for patients to sign or brochures that highlight the risks and benefits, as well as the consequences and the potential side effects, should be the last thing patients have in hand when they leave the office.

If patients sign contact lens agreements and for their records or Health Insurance Portability and Accountability Act (HIPAA) forms, then ODs should also have them sign an agreement about the course of their surgical procedure.

Medicine is not an exact science, and ODs know they can minimize the sequelae of any treatment.

A surefire way to be upfront and honest is to describe all the possibilities and point out the limitations. Be an advocate for the patient and provide good clinical advice. Patients will appreciate it, and an unexpected misunderstanding can be avoided.

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MARC R. BLOOMENSTEIN, OD, FAAO Director of optometric services at Schwartz Laser Eye Center in Scottsdale, AZ
Intraocular pressures (IOPs) were 13 mm Hg and 10 mm Hg via Icare handheld tonometer.

Anterior segment was remarkable for mild signs of meibomian gland dysfunction and mild nuclear sclerotic cataracts in both eyes.

A dilated fundus examination indicated a large optic nerve head with a cup-to-disc ratio of 0.5 in both eyes.

Interestingly, a small CWS was discovered along the inferior arcade below the macula in the right eye (see Figure 1).

A chart review of her fundus photography records from the previous year did not show evidence of a CWS (see Figure 2).

Per our practice protocol, a complete blood count (CBC) with differential was ordered, and a letter was sent to the primary-care physician (PCP) to inform this new finding. The patient was referred to her PCP and was scheduled to follow up in one month with our office.

Follow-up
On May 15, 2017, R.M. returned for her follow-up exam during which she indicated she had undergone abdominal surgery on May 1, 2017, to repair a bleeding stomach ulcer.

The requested blood work performed on April 12, 2017, indicated severe blood loss and anemia from the bleeding ulcer. Her hematocrit level, a measurement of the amount of red blood cells (RBCs) in the blood, was 25.4 percent. Normal hematocrit ranges are 36 to 46 percent in women.3

Additionally, her hemoglobin (Hb), an iron-binding, oxygen-carrying protein within RBCs, count was low (7.2 g/dL; normal 12-15 g/dL).3

The mean corpuscular volume (MCV), a measure of the average volume of red blood cells, was 70.6 fl. Normal female MCV ranges 76 to 96 fl.3

Contextually, a lower number for each of these diagnostics may be indicative of anemia.

Retinal evaluation at this visit revealed a smaller-sized, faintly resolving CWS (see Figure 3).

Repeat blood work conducted on June 16, 2017, with a hematocrit level raised to 45.5 percent, a hemoglobin count of 14.1 g/dL, and a MCV normalized to 87.3 fl.

On July 7, 2017, R.M. returned for a follow-up visit where the CWS had spontaneously resolved (see Figure 4).

Discussion
In eye care, CWS is used to describe a retinal nerve fiber layer infarct caused by focal interruption of axoplasmic flow.

Cotton wool spots can be a sign of a number of systemic ailments, including anemia. Anemia occurs when the level of RBCs or Hb is too low. Iron deficiency is the most common type of anemia.

Other causes of anemia include blood loss, inadequate production of red blood cells (aplastic anemia), or increased destruction of red blood cells (hemolytic anemia) that may present lifelong health problems.

Type 2 diabetes mellitus (T2DM) should be considered as a potential etiology for anemia.4 The condition was identified as an independent risk factor of diabetic retinopathy, and more severe retinopathy was found in anemic patients than in non-anemic patients.5,6

Other interrelated health conditions such as rheumatoid arthritis (RA), pernicious anemia causing vitamin B12 deficiency, and malaria can be connected to anemia.

Of note, leukemia, lymphoma, and myeloma all downregulate white blood and plasma cell function that can also lead to this disease state.7

Anemia causes retinopathy in 28 percent of patients, especially when there is coexisting thrombocytopenia (38 percent). As the severity of anemia increases, the risk of retinopathy increases, particularly when the Hb level is below 6 g/dL.8

Moreover, sickle cell disease constitutes a group of autosomal recessive genetic disorders characterized by the variant, Hb S.9

**Editor’s Note:** This case report is part of a series by members of Intrepid Eye Society.

**Figure 2.** Normal fundus OD.

**Figure 3.** Resolving cotton wool spot inferior arcade.

**Figure 4.** Resolved cotton wool spot.

**TAKE-HOME MESSAGE** A patient presenting for a routine exam exhibits a cotton wool spot not seen previously. Blood loss due to a bleeding stomach ulcer caused anemia. Uterus repaired improved the patient’s bloodwork, and the cotton wool spot spontaneously resolved. ODs should add anemia to their differential diagnosis for cotton wool spots, as illustrated by this case.
Conclusion
The exact pathophysiology of anemic retinopathy is not completely understood. However, it seems to be related to retinal hypoxia, venous stasis, angiospasm, or increased capillary permeability.11

When anemia causes retinal hypoxia, it can lead to infarction of the nerve fiber layer and clinically manifest as cotton wool spots. The ocular changes found in anemic retinopathy are nonspecific and may closely resemble diabetic or hypertensive retinopathy, such as retinal hemorrhages and macular edema.12

As alluded to in the discussion, this disease state may also be a secondary manifestation of other systemic diseases such as cancer or autoimmune disorders. Therefore, in addition to ordering a complete blood count, other appropriate medical testing may be necessary.

With a timely diagnosis, anemic retinopathy can be stabilized and treated to prevent long-term damage to your patient’s vision.

REFERENCES
Image aids in differential diagnosis of uncommon disease

Patient initially presented with poor vision following cataract surgery

Editor’s Note: This case report is part of a series by members of Intrepid Eye Society.

By Daniel Epshtein, OD, FAAO

A 67-year-old Asian female presented with a complaint of worsening blurred vision in both eyes over the previous five years. She reported unremarkable cataract extraction OU three years prior. While the patient admitted that her vision did improve after the cataract extraction, she was still not happy with her near vision.

Medical and ocular history
Her medical history was positive for type 2 diabetes and hypertension controlled with metformin and lisinopril (Prinivil, Merck). She reported her last fasting blood sugar as 134 mg/dL and HbA1c as 6.4 percent. Best-corrected vision was 20/30 OU with a plano refraction. Pupils were equal, round, reactive to light, and without an afferent pupillary defect. Motility testing was smooth and full OU, along with normal confrontation visual fields OU.

Clear and centered posterior chamber intraocular lenses (IOLs) were noted OU with slit lamp biomicroscopy. Intraocular pressures (IOPs) were 14 mm Hg OU with Goldmann applanation tonometry. The remainder of the anterior segment exam was unremarkable.

Dilated fundus exam revealed a posterior vitreous detachment, healthy optic nerve head appearance, age-appropriate vasculature, and unremarkable retinal periphery OU.

Foveal pigmentary changes were appreciated OU with a single druse seen extrafoveally OD only (See Figure 1). Careful examination of the vessels temporal to the fovea uncovered tortuosity, but there was no evidence of edema or epiretinal membrane present. Aside from the single druse OD macular findings were symmetrical between both eyes.

Macular optical coherence tomography (OCT) was ordered to better evaluate the retinal degeneration. Internal limiting membrane drape with several round hyporeflective spaces were noted in each eye.

A baseline fluorescein angiogram was scheduled to rule out diabetic retinopathy or other forms of maculopathy. It revealed mild hyperfluorescence most prominent on the temporal fovea OU. Vessel tortuosity on the temporal fovea only was also confirmed. Angiographic results were symmetrical between the two eyes.

Diagnosis
Though the patient was diabetic, the funduscopic and OCT findings were not consistent with diabetic macular edema. There was no hemorrhaging, exudation, retinal thickening, or extramacular findings in either eye.

The OCT images revealed internal limiting membrane drape and cavitation without retinal thickening that is consistent with macular telangiectasia type 2 (MacTel type 2). Fluorescein angiogram confirmed the findings, and no treatment was deemed necessary.

The patient was apprised of all findings and educated on the pathogenesis and prognosis of MacTel type 2. She was offered a low vision referral to aid with her near vision blur, but she deferred the consultation.

Figure 1.
Above, fundus photography and fluorescein angiography reveal mild vasculopathy. Below, OCT imaging reveals internal limiting membrane drape and cavitation.

1

Take-home message
A patient with diabetes presented with worsening blurred vision, even after cataract surgery. Imaging testing showed a single druse and internal limiting membrane drape and cavitation without retinal thickening. The patient was diagnosed with macular telangiectasia type 2.
A follow-up visit was scheduled for six months to re-evaluate the retinal findings.

**Discussion**

MacTel type 2 is a bilateral, symmetric, and progressive retinopathy characterized by retinal neurodegeneration and vasculopathy confined to the foveal and juxtafoveal space.\(^1,2\)

MacTel type 2 is distinguished from MacTel type 1 in that the vascular findings of the latter are associated with edema and occasionally found outside the macula.\(^3\) The exact pathogenesis is still unknown, but research implicates Müller cell loss.\(^1,3\)

Previous population studies based on photographic evaluation have reported prevalence of less than 0.1 percent.\(^2\) Contrary to these studies, experts believe that MacTel type 2 is more common but significantly underdiagnosed because earlier stages of MacTel type 2 are difficult to detect clinically. Later stages often resemble age-related macular degeneration (AMD) or the atrophic stage of chronic macular edema, further confounding prevalence studies.\(^4\)

Earlier stages of MacTel type 2 are characterized by loss of retinal transparency, retinal telangiectasia, right-angle venules, intra-retinal crystalline deposits, and foveal thinning.\(^1\) These findings are almost always more prominent on the temporal side of the fovea.

As the disease progresses, retinal pigment hypertrophy develops that can lead to sub-retinal neovascularization. OCT imaging will reveal internal limiting membrane drapes, cavitations, and outer retinal degeneration.

Though cavitations may be confused for fluid accumulation, MacTel type 2 changes are atrophic in nature unless there is noted neovascularization. Significant variability in presentation and progression has been noted, though this is poorly understood at this time.

Currently, there is no accepted treatment for the nonproliferative form of MacTel type 2.

**Future thoughts**

A pilot study investigating the use of carotenoid supplementation has shown promising results in stabilizing vision and improving retinal architecture as imaged by OCT, but no large-scale studies have been initiated.\(^5\)

Diagnosis of MacTel type 2 is difficult with clinical evaluation alone. Multimodal imaging aids in differentiating this disease from more common entities such as diabetic retinopathy, cystoid macular edema, and AMD.

**REFERENCES**


Dr. Epshtein’s interests focus on ophthalmic imaging and clinical diagnosis. In his free time, he enjoys traveling and has recently taken up swimming. Daniel.Epshtein.OD@gmail.com.
Why doctors are rethinking AMD standards

Continued from page 1

The authors set out to determine to what extent AMD is underdiagnosed by optometrists and ophthalmologists when the disease is actually present. In the study, they reviewed the medical records of 644 adults 60 years or older who were enrolled in ALSTAR. To be eligible, the patient’s medical record from the most recent comprehensive dilated examination did not indicate a diagnosis of AMD in either eye, and the medical record notes did not contain terms that signified the signs of AMD.

Each patient in the ALSTAR study had digital color fundus photos taken, which were reviewed by masked, trained graders who determined the presence or absence of AMD findings according to the Clinical Age-Related Maculopathy Staging (CARMS) system. The types of AMD-associated lesions also were noted. Results revealed that one of four eyes studied was not diagnosed with AMD during the dilated fundus examination, despite these eyes having large drusen, a known risk factor for wet AMD.

Nonexudative AMD is often not diagnosed until the patient presents with drusen and visual function like difficulty driving at night. According to the Clinical Age-Related Maculopathy Staging (CARMS) system, the types of AMD-associated lesions also were noted. Results revealed that one of four eyes studied was not diagnosed with AMD during the dilated fundus examination, despite these eyes having large drusen, a known risk factor for wet AMD.

Wake-up call
There is no doubt that many AMD patients are overlooked. A study published in JAMA Ophthalmology showed just how often a diagnosis is missed.

This cross-sectional study, which included 1,288 eyes (644 adults) from patients enrolled in the Alabama Study on Early Age-Related Macular Degeneration (ALSTAR), revealed that doctors are missing AMD about 25 percent of the time.

Also quite concerning is that 30 percent of the undiagnosed eyes in the study had large drusen, a known risk factor for wet AMD.

The authors set out to determine to what extent AMD is underdiagnosed by optometrists and ophthalmologists when the disease is actually present. In the study, they reviewed the medical records of 644 adults 60 years or older who were enrolled in ALSTAR. To be eligible, the patient’s medical record from the most recent comprehensive dilated examination did not indicate a diagnosis of AMD in either eye, and the medical record notes did not contain terms that signified the signs of AMD.

Each patient in the ALSTAR study had digital color fundus photos taken, which were reviewed by masked, trained graders who determined the presence or absence of AMD findings according to the Clinical Age-Related Maculopathy Staging (CARMS) system. The types of AMD-associated lesions also were noted. Results revealed that one of four eyes studied was not diagnosed with AMD during the dilated fundus examination, despite these eyes having large drusen, a known risk factor for wet AMD.
having macular characteristics indicative of AMD in the fundus photos. 
Approximately three-fourths of the 320 undiagnosed eyes had 10 or more small drusen (249 [77.8 percent]) and/or intermediate drusen (250 [78.1 percent]), and 96 (30.0 percent) of the undiagnosed eyes had large drusen. ³

More frequent follow-up visits provide the clinician increased opportunity to detect CNV before visual acuity loss

Preserve visual function
The goal of managing AMD is to preserve visual function. To achieve this goal, proper early detection, diagnosis, monitoring, and treatment must be practiced.

Unfortunately, many doctors are passive when diagnosing and treating nonexudative AMD. ¹ ⁷ Nonexudative AMD is often not diagnosed until the patient presents with drusen and visual function changes. By this criterion, the patient likely has had the disease for years. The patient has lost some of the potential benefits of proactive treatment. In addition, the patient is at higher risk of central visual loss, especially in the first eye that progresses to choroidal neovascularization (CNV). ⁸ ⁹

There is no cure for AMD, so eyecare professionals must try harder to halt or slow the disease progression. Earlier detection allows for earlier treatment, which can potentially lead to better patient outcomes.

With proper care, significant visual acuity loss may be prevented in many patients. In fact, authors of the JAMA study point out that improved AMD detection strategies may be needed because many of the patients with missed diagnoses would have been candidates for therapeutic intervention with nutritional supplements. ³

Simplified staging
The Beckman Initiative for Macular Research
See AMD standards on page 18
AMD standards

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published a classification system designed for use in a primary care setting.10 The practical guidelines presented here are a modification of the Beckman system (see Figure 1).

However, the Beckman system is based solely upon structural findings—whereas the practical guidelines are based upon the structural findings and augmented by functional findings. As with other diseases, such as glaucoma, diagnosing and staging AMD is most accurately and easily achieved when both structure and function are taken into consideration.

Another key difference between the new practical guidelines and the Beckman system is that the new system defines a disease stage called “subclinical AMD,” which is the stage at which abnormal dark adaptation is present in the absence of drusen and/or RPE pigmentedary changes.

In AMD, functional deficits often exist before structural change is evident. Histopathological studies have shown that retinal pigment epithelium (RPE) cells deposit locally generated cholesterol beneath the RPE cell layer and in Bruch’s membrane before drusen are formed.11

With disease progression, cholesterol continues to accumulate, resulting in focal areas that are sufficiently thickened to be identified as drusen. Thus, drusen caused by AMD are the tip of an iceberg of the earliest lesions caused by AMD. More dysfunction is present than would be concluded simply on the appearance of drusen.

The fact that a patient has visual symptoms of impaired dark adaptation before we can clinically detect illustrates the imperative to be more proactive in early detection and intervention.

These functional deficits are easily detected using dark adaptation testing.12 Indeed, impaired dark adaptation, which is often expressed by the patient as night vision difficulties, is often the first detectable consequence of AMD and can be used to identify patients with subclinical disease.13

Treatment to preserve vision

The management of AMD has two primary goals, both aimed at preserving vision:

- Prevent progression to advanced AMD—geographic atrophy (GA) and choroidal neovascularization (CNV)
- Effectively detect and manage CNV

Achieving these goals will allow the patient to enjoy additional years of high-quality central vision, enhancing the odds of a better quality of life.

Early diagnosis and consistent, aggressive management of the disease are required to minimize risk of vision loss. Based on our current understanding of AMD pathogenesis, the stages of subclinical, early, and intermediate AMD represent different clinical manifestations of the same underlying disease process. Thus, the treatment of the disease should be initiated at first detection, regardless of the stage.

The following treatment recommendations apply to patients with all stages of AMD:

- Prescribe smoking cessation programs. Smoking is the largest modifiable risk factor for the progression of both CNV and GA,14 yet in one study, 90 percent of patients with AMD were not advised to stop smoking.15
- Prescribe nutritional supplements. Although there is debate about which supplements are most appropriate, evidence strongly suggests prescribing them because, on average, treated patients have better outcomes than untreated patients.16,17
- Discuss diet and exercise lifestyle modifications. Following a healthy diet, exercising regularly and maintaining overall health are sound goals for all patients.17

These lifestyle choices may act synergistically to prevent or delay onset or progression of AMD. Research shows that women who followed a healthy diet, engaged in physical exercise, and avoided smoking had substantially lower risk of early AMD compared with women who did not follow these healthy lifestyles.18,19

- Manage systemic disease. Several systemic conditions carry an increased risk of the development of AMD, based on epidemiological studies.

Cardiovascular disease, diabetes, hypocholesterolemia, and obesity have been associated with increased risk of AMD and/or progression of AMD.20,21 Body mass index and abdomi-
nal obesity are independent risk factors for progression to advanced AMD.20

Prescribe retinal light protection. Epidemiological evidence suggests that chronic sunlight exposure increases the risk of incident AMD and its progression.21 Based on increased study in this area, you may also want to consider recommending high energy visible light (HEVL)-blocking eyeglass lenses.

Finally, for a patient with AMD, more frequent retinal examinations are recommended. Moving from a 12-month follow-up interval to a six-month (or even shorter in some cases) follow-up interval may be useful for monitoring disease progression.22 More frequent visits provide the clinician increased opportunity to detect CNV before visual acuity loss and to continue to educate the patient.

AMD is a devastating disease that has been complicated by diagnostic and treatment uncertainty for far too long. These new practical guidelines aim to simplify care and preserve many years of vision for millions of patients.

REFERENCES

See AMD standards on page 20
AMD standards

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Dr. Gerson’s area of emphasis is retinal disease, but he practices full scope optometry. He lectures and authors frequently. He enjoys biking and swimming and traveling with family. is an adviser for MacuLogix. He is a member of the speakers’ bureau for Bausch + Lomb, Allergan, VSP, and ZeaVision.

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4. OCT shows the small drusen under the RPE in the same patient’s eyes, but her macular contour is normal overall. Inferiorly, a mild amount of retinal atrophy OD>OS is worsening over a one-year period per the OCT change analysis. Her rod intercept time is significantly delayed in both eyes but worse in the right eye (18.17 minutes OD vs. 15.61 minutes OS), which matches the more advanced fundus appearance of OD compared to OS. The patient was graded with early bilateral nonexudative macular degeneration due to her small to medium drusen OD>OS and abnormal dark adaptation OD>OS. The patient was educated about the etiology and management protocol for macular degeneration including lifestyle changes, AREDS2 therapy, Amsler grid at-home screening, and routine monitoring with dilation and fundus examination. She is monitored every five months for progression to wet AMD. If the funduscopic appearance or rod intercept in dark adaptometry worsens over time she will be monitored more closely in three- to four-month intervals. Photos courtesy Amanda Legge, OD

Figures 4 and 5.
How to handle non-ophthalmic emergencies

ODs should have a basic knowledge of first aid for use in and out of the office

By Andrew S. Gurwood, OD, FAAO

While it is a foregone conclusion that eyecare practitioners are experts in providing eye care, because of limited experience and insufficient repetition in the skills necessary for the treatment of systemic emergencies, they are often reluctant or unable to dispense what may be potentially life-saving care for non-ophthalmic emergencies both in and out of the office.

When an injury or healthcare emergency is encountered, the doctor, at the very least, should initiate the response of emergency medical services (EMS) by activating the EMS system. This is done by calling 911 (the nationwide EMS number), providing a description of the nature of the emergency, and giving the location of the emergency (never being the first to hang up the phone—today, dispatchers are trained personnel capable of providing life-saving instructions).¹

Performing first aid is an obligation only while the doctor is on duty. While out of the office and wearing no identifying markings of a person skilled in dispensing medical services, there is no duty to act. However, with basic training and by using common sense, appropriate and timely interventions can increase the rate of saving function and the rate of saving a life.²,³

First aid history

The modern EMS system takes its roots from the military between 1790 and the mid-1900s when it served to introduce the concept of moving or transporting patients away from the hazards of battle.¹

In the 1960s, the idea was refined to beginning first aid at the scene and allowing it to proceed, uninterrupted, from the place of occurrence through hospital treatment. In 1966, The National Highway Safety Act charged the United States Department of Transportation (DOT) with developing and organizing EMS standards nationwide, for the purpose of improving “prehospital” care.¹

The law

Medical/legal and medical/ethical concerns are included in one’s decision to render care. Rendering care to a minor without a parent or guardian, rendering care to the unconscious, making sure that a terminally ill patient or victim wants your help, making sure that a conscious casualty wants your help, and the delivery of competent emergency care are sources of hidden anxiety and liability.²

The Good Samaritan Law exists in all states and was developed to shield from liability individuals who might try—in good faith, to the best of their ability, and to the standard of care for their level of training—to provide assistance in an emergency.¹ The laws do not prevent individuals (victims or relatives) from initiating lawsuits nor do they protect rescuers from being sued.²,³ The laws will not protect caregivers from liability in cases of gross negligence, such as an intentional act or omission which egregiously falls short of standard of care resulting in harm to the patient.²,⁴

Expressed consent is permission given by adults who are of legal age (this varies from state to state and is usually over age 16) or emancipated minors (those living away from home such as college students or individuals married and on their own) and judged to be mentally competent to make a rational decision regarding their well-being.²,³,⁵ Such consent must be obtained from all conscious patients who are able to provide it before care begins.

Implied consent applies to unconscious patients. In this circumstance, it is implied that if the patient were rational and conscious, he would permit help.²,³ This allows rescuers the flexibility to treat the unconscious.²

Treating a conscious, mentally competent patient, without her consent is considered assault and battery. Transporting such a patient without consent is considered kidnapping.

The “do not resuscitate” (DNR) order is a written, legal, advanced directive signed by the patient and his doctor. Without the properly notarized document in hand, rescuers and doctors should proceed to start care if they are on duty or if they have decided to intervene.³

Children and mentally incompetent adults cannot legally provide consent or refuse medical care or transport. Consent must be obtained from a parent or legal guardian before care can be initiated. Implied consent covers children in life-threatening situations in which a parent or guardian is not present to provide consent.²

Once care is initiated, it must remain ongoing and can be transferred only to someone of equal or greater healthcare rank.¹

TAKE-HOME MESSAGE

While ODs are trained to handle ocular emergencies, they may not know how to handle non-ocular emergencies. A basic understanding of first aid can help ODs better manage emergency situations both and out of the office.

This includes understanding the principles of consent and how to treat minors, surveying the scene, building an emergency kit, and treating shock and bleeding.

See Emergencies on page 22
rank. The caregiver/first responder becomes the patient advocate. Leaving the patient and/or scene before securing proper another appropriate caregiver constitutes abandonment.36 The rescuer may stop care to save his own life if the scene deteriorates or if he becomes too exhausted to continue the rescue.

Conscious patients have the right to refuse care. When a patient refuses care, four conditions must be fulfilled:2
- The patient must be legal to consent (adult or emancipated minor)
- The patient may refuse whether or not he is mentally oriented
- The patient must be informed of the consequences
- The patient must sign a release of liability, indicating the informed refusal of care

The concept of negligence is recognized as an intentional act or omission resulting in the failure to act properly within the boundaries of one’s level of training.2

Scene safety
Every situation should begin with a scene size-up.1-10 That is, observing the area in which the incident or injury occurred, victim, bystanders, circumstances, and elements involved.

Reassessing the mechanism of injury, breathing, vital signs, and interventions are a staple of EMS care

In fact, any time an incident occurs outside of the office, one should be mindful to treat the area as a crime scene: observe who is involved; do not move objects; if you move something to render care, remember where it came from or place it back.

When an incident happens in the office, it’s a foregone conclusion that the practitioner would know what happened by proxy or direct observation. Scene size-up allows responders to become part of the solution instead of part of the problem. Rushing into an environment full of hazards (such as fire, water, chemicals, natural gas, sharps, and more) can result in injury to the helper, creating the need for a second rescue.1.5-10

The dangers of potential exposures to both airborne and bloodborne pathogens (Hepatitis B and C, tuberculosis, human immunodeficiency virus [HIV], chicken pox [varicella], measles [rubella], bacterial and viral meningitis) mandate specific precautions before initiating patient contact.1.2,5-10

The methods and equipment used for protection against bloodborne and airborne pathogens were previously termed “universal precautions.” Today, it has been redefined as “body substance isolation precaution” (BSI).1,7-10 Everyone in every situation, everytime should be handled the same.1,7-10

A lab coat, scrubs, protective mask, protective eyewear, and gloves make up personal protective equipment (PPE).7-10

Required instruments
The basic trauma/urgencies first response kit has some requirements. Each compartment should be easy to access and well labeled.

The first compartment in the kit should contain BSI (several pairs of gloves, masks, goggles) along with critical emergency phone numbers and instruction cards.

Another compartment should house the instruments which measure vital signs (blood pressure, pupils, lung sounds, respiration, pulse, skin) such as a stethoscope, sphygmomanometer, and penlight. It should also contain data recording devices (several pens and forms). A stopwatch and a thermometer might be helpful but are optional.

The main compartment of the bag should store airway management devices such as a pocket mask or bag valve mask, bite sticks, and airways (if the attending knows how to use them). Oxygen masks (nonrebreather mask, nasal canula) should be available only as licensure permits. An automatic external defibrillator (AED) is also a nice option.

Finally, the kit should include various wound and bleeding control implements along with antiseptics (Band-Aids, 4x4 bandages, gauze bandages, Ace bandages, tape, scissors, tweezers).

Wool blankets or towels are versatile tools in the first-aid armamentarium. They can be used to warm the patient and prevent shock, elevate the legs and or head for comfort, or to cover the patient to prevent exposure from debris. When rolled, blankets or towels can be used creatively as flexible/moldable splints, cravats (slings), and temporary cervical immobilization collars.

While cervical immobilization devices (CID collars) are an essential element of managing victims of trauma, they are not an absolute requirement because most people do not know how to use or size them properly. An improperly fitted CID can disturb the injury, affect breathing, and lead to unnecessary movement by the patient or treatment team. Because EMS will be summoned, manually holding the head and cervical spine steady is satisfactory; however once head holding begins, it must be maintained until someone with proper credentials clears the spine.

Basic life support sequence
The CABH approach to emergency care stands for: Circulation, Airway, Breathing, and Hemorrhage.11-16

Recent changes to the cardiopulmonary resuscitation (CPR) sequence recognize
that most non-professional rescuers do not know how to properly assess for a pulse. The new algorithm calls for rescuers who find unconscious individuals when they did not witness what happened or how the person lost consciousness to immediately begin compressions at a rate of 100 compressions per minute. The balance of the CPR protocol can be followed (layperson [non-breathing] or healthcare professional with automatic external defibrillator [AED] use).

I add hemorrhage to this protocol as a reminder that circulating the blood via compressions without stopping life-threatening bleeding is counterproductive and fatal.\(^{11-18}\) While CPR increases the probability of recovery for the lifeless, rapid external defibrillation via the deployment of an AED provides the best chance for patient survival.\(^{11,12,20-22}\)

First response
According to the first responders, all unconscious cases, whether determined to involve medical circumstances (diabetes, seizure, fainting, myocardial infarction) without a significant mechanism of injury (head trauma, high speed injury, fall from two times the person’s height) or involving significant mechanism of injury should be handled with the same approach:

- Assess and size up the scene, making sure it is safe to intervene
- Begin a rapid medical/trauma assessment by observing the entire body working from the head down. Included in the rapid assessment are:
  - Examination of the head (bleeding from the nose, ears, obstruction of the airway)
  - Neck (bleeding, deformities, normal jugular vein distention)
  - Chest (paradoxical motion, broken ribs)
  - Abdomen (rigid/distended belly)
  - Pelvis
  - Extremities
- Back; the casualty should not be rolled unless the first responder is skilled in the proper technique. Unskilled rescuers can slip a gloved hand under the casualty to determine if there is bleeding or other concerns

A child should be examined from the feet up because children may become frightened with a stranger so close to their faces.

Once the patient is determined to be breathing and stable, a more detailed evaluation can begin. A detailed assessment includes looking for deformities, contusions, abrasions/punctures, burns, bleeding, tenderness, lacerations and swelling.

See Emergencies on page 26.

The best way to manage shock is to prevent it—keep the patient well oxygenated, warm, and lying in the recovery position, if possible.

In these cases, the rescuer needs to call EMS and provide stabilizing interventions until EMS arrives, reassessing the patient every five minutes to ensure that the interventions are still working.\(^{11-16}\)

Things become more complicated when with an unconscious victim.\(^{23}\)

For the first responder, all unconscious cases, whether determined to involve medical circumstances (diabetes, seizure, fainting, myocardial infarction) without a significant mechanism of injury (head trauma, high speed injury, fall from two times the person’s height) or involving significant mechanism of injury should be handled with the same approach:

- Assess and size up the scene, making sure it is safe to intervene
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Refractive Cataract Surgery: Creating a new paradigm with extended-depth-of-focus IOL technology

Josh Johnston, OD, FAAO

The opportunity to achieve patient satisfaction after cataract surgery with implantation of a presbyopia-correcting intraocular lens (IOL) has improved with innovations in IOL technology. Early-generation multifocal IOLs did not address patient needs for good uncorrected intermediate vision. These lenses also had significant potential to cause highly symptomatic photic phenomena in some patients, which meant that clinicians could end up spending a lot of chair time in postoperative patient management. As a consequence, interest was dampened in presbyopia-correcting IOL technology.

The TECNIS Symfony®/TECNIS Symfony® Toric extended-depth-of-focus IOLs represent a significant advance in the category of presbyopia-correcting IOLs. The TECNIS Symfony® IOL is distinguished from multifocal IOLs by its novel diffractive echelette design (Figure). Instead of providing two discrete foci as does a traditional multifocal IOL, the TECNIS Symfony® IOL optic elongates the focal point to deliver an extended range of functional vision.

In addition, the TECNIS Symfony® IOL optic uniquely corrects chromatic aberration and compensates for spherical aberration of an average natural human eye.1 Because of these features, it provides good quality of vision.3 Results from the US pivotal clinical trial evaluating the TECNIS Symfony® IOL show that the difference in contrast sensitivity between TECNIS Symfony® IOL and monofocal is not clinically significant and a low incidence of nighttime visual symptoms.3

In my experience, patients who have been implanted with the TECNIS Symfony® IOL are happy with their outcome and have been an excellent source of word-of-mouth referrals. Still, the optometrist plays an important role both preoperatively and postoperatively in optimizing success and satisfaction in these cases.

Preoperative counseling

As the primary eye care provider for many patients, optometrists often make the diagnosis of cataract and then initiate the preoperative evaluation and patient education process. Because of our role, it is incumbent on optometrists to be fully versed in the features of available IOL technologies so that we can give patients thorough and accurate information about their options for surgery and vision correction.

I tell patients there is no perfect IOL, but that I can confidently recommend the TECNIS Symfony® IOL for individuals whom I consider appropriate candidates. The TECNIS Symfony® IOL meets the needs of patients who want a full functional range of vision and, in particular, provides excellent visual acuity at far and intermediate distances. With people now spending so much time on their computers, reading from tablets, or looking at a cell phone, most patients today are especially motivated to achieve good uncorrected intermediate vision.

From my perspective, postoperative management is simple and straightforward. Typically, I see these patients at their planned postoperative visits 1 day, 1 week, and 1 month after surgery.

The follow-up visit for patients with the TECNIS Symfony® IOL involves slightly more chair time compared with patients who have a monofocal IOL. The difference, however, is minimal, and I think it is a good clinical pearl and customer service tip to spend more time with premium IOL patients and to give a little more TLC. Patients who have invested in a premium technology have heightened expectations. With that said, the TECNIS Symfony® IOL delivers...
good outcomes. So, patients seem happy having their expectations met.

It is important to remind TECNIS Symfony® IOL patients that the lens is a different optical system and the brain needs to get used to it. I explain that after the second eye is operated on, the eyes will start to work well together as a team and their vision will improve. In addition, I tell patients that while the TECNIS Symfony® IOL allows a functional range of vision with great distance and intermediate vision, they are likely to need glasses to read small print or up close.

I make it a point to ask patients with a TECNIS Symfony® IOL how their near and intermediate vision is doing. I ask if they are enjoying their new vision after surgery and wearing glasses less often. I make this a fun conversation, having them tell me about the positives.

In addition to the excellent range of vision patients report with the TECNIS Symfony® IOL, they often tell me how much brighter and more vibrant colors are after their cataract surgery. This is something I do not often hear from my monofocal patients.

Some patients implanted with the TECNIS Symfony® IOL may comment initially that colors appear different, but these reports are expressed as an observation rather than a complaint or concern. Patients who describe a change in color perception tend to mention it only in the early postoperative follow-up period, at 1 day or 1 week after surgery, because it seems to become less noticeable over time. I believe that the phenomenon may be related to the IOL’s achromatic technology, which I explain to patients.

In my experience, patients implanted with the TECNIS Symfony® IOL have generally voiced limited complaints about glare and halos. They might acknowledge experiencing nighttime symptoms if asked about them specifically, but even counting those patients, the incidence of dysphotopsia seems low.

Obtaining an accurate refraction

Refractive error should be considered in the workup for any patient with a TECNIS Symfony® IOL who raises concerns about their vision, and it is part of the standard evaluation after cataract surgery. In obtaining the measurement, however, it is important to use manifest refraction techniques unique to the IOL’s echellette technology to avoid over-minus endpoints. To achieve a true reading, examiners should perform a “push plus” technique and watch for the “refractive plateau.” Refraction should be done in each eye, beginning by fogging the patient with +0.50 D over the anticipated refraction, pushing plus to avoid over-minusing these patients. Do not rely on an autorefractor, because many of these devices use infrared light that has chromatic aberration correction and therefore generates a falsely myopic result for an eye implanted with achromatic technology.

Conclusion

To best serve patients, optometrists should identify and recommend surgery for a cataract once it becomes symptomatic. Then, optometrists need to stay progressive and keep abreast of the latest advances in IOL technology so that we can fully educate patients about their surgical options and match patients with an IOL that will meet their vision goals and expectations.

In July 2016, the FDA approved the TECNIS Symfony® IOL as the first IOL that provides cataract patients with an extended depth of focus. Over the past 2 years, I have found it to be a valuable option for patients who want to wear glasses less often for a variety of activities. With the availability of the TECNIS Symfony® IOL, I am comfortable recommending a presbyopia-correcting IOL to a broader pool of patients and gratified by their overall satisfaction.

REFERENCES

1. DOF2015CT0023_Chromatic aberration of the TECNIS Symfony® IOL.
2. DOF2015CT0018_Chromatic aberration of the TECNIS Symfony® IOL.
3. TECNIS Symfony® IOL DU.
4. DOF2015CT0020_Symfony®_MT_versus_competition.

INDICATIONS and IMPORTANT SAFETY INFORMATION for TECNIS SYM’FY® and TECNIS SYM’FY® TORIC EXTENDED RANGE OF VISION IOLs

Rx Only

INDICATIONS FOR USE

The TECNIS Symfony Extended Range of Vision IOL, Model ZXR00, is indicated for primary implantation for the visual correction of aphakia, in adult patients with less than 1 diopter of pre-existing corneal astigmatism, in whom a cataractous lens has been removed. The lens mitigates the effects of presbyopia by providing an extended depth of focus. Compared to an aspheric monofocal IOL, the lens provides improved intermediate and near visual acuity, while maintaining comparable distance visual acuity. The Model ZXR00 IOL is intended for capsular bag placement only. The TECNIS Symfony Toric Extended Range of Vision IOLs, Models ZXT150, ZXT225, ZXT300, and ZXT375, are indicated for primary implantation for the visual correction of aphakia and for reduction of residual refractive astigmatism in adult patients with greater than or equal to 1 diopter of preoperative corneal astigmatism, in whom a cataractous lens has been removed. The lens mitigates the effects of presbyopia by providing an extended depth of focus. Compared to an aspheric monofocal IOL, the lens provides improved intermediate and near visual acuity, while maintaining comparable distance visual acuity. The Model Series ZXT IOLs are intended for capsular bag placement only.

WARNINGS

Patients with any of the conditions described in the Directions for Use may not be suitable candidates for an intraocular lens because the lens may exacerbate an existing condition, may interfere with diagnosis or treatment of a condition, or may pose an unreasonable risk to the patient’s eyesight. Lenses should not be placed in the ciliary sulcus. May cause a reduction in contrast sensitivity under certain conditions, compared to an aspheric monofocal IOL; fully inform the patient of this risk before implanting the lens. Special consideration should be made in patients with macular disease, amblyopia, corneal irregularities, or other ocular disease. Inform patients to exercise special caution when driving at night or in poor visibility conditions. Some visual effects may be expected due to the lens design, including: a perception of halos, glare, or starbursts around lights under nighttime conditions. These will be bothersome or very bothersome in some people, particularly in low-illumination conditions, and on rare occasions, may be significant enough that the patient may request removal of the IOL.

Rotation of the TECNIS Symfony Toric IOLs away from their intended axis can reduce their astigmatic correction, and misalignment >30° may increase postoperative refractive cylinder. If necessary, lens repositioning should occur as early as possible prior to lens encapsulation.

PRECAUTIONS

I interpret results with caution when refracting using autorefractors or wavefront aberrometers that utilize infrared light, or when performing a duochrome test. Confirmation of refraction with maximum plus manifest refraction technique is recommended. The ability to perform some eye treatments (e.g. retinal photocoagulation) may be affected by the optical design. Target emmetropia for optimum visual performance. Care should be taken to achieve IOL centration, as lens decentration may result in a patient experiencing visual disturbances under certain lighting conditions. For the TECNIS Symfony Toric IOL, variability in any preoperative surgical parameters (e.g. keratometric cylinder, incision location, surgeon’s estimated surgically induced astigmatism and biomey) can influence patient outcomes. Carefully remove all viscoelastic and do not over-inflate the capsular bag at the end of the case to prevent lens rotation.

SERIOUS ADVERSE EVENTS

The most frequently reported serious adverse events that occurred during the clinical trial of the TECNIS Symfony lens were cystoid macular edema (2 eyes, 0.7%) and surgical reintervention (treatment injections for cystoid macular edema and endophthalmitis, 2 eyes, 0.7%). No lens-related adverse events occurred during the trial.

ATTENTION: Reference the Directions for Use for a complete listing of Indications and Important Safety Information.
Given which includes:

- Working.
- Perfusion (capillary refill), and evaluation of circulatory status, reassessment of vital signs, reassessment of mental status, reassessment of injury/life threatening medical cases,
- Each reassessment should include measurement of vital signs, reassessment of mental status, reassessment of circulatory perfusion (capillary refill), and evaluating whether the current interventions are working.

When EMS arrives, a report should be given which includes:

- Demographics of the patient
- Description of the events that lead up to the injury or illness

Shock and bleeding

It is imperative one recognize the signs and symptoms of shock or hypoperfusion. Shock is the failure of the circulatory system to provide adequate oxygenation to the body. It may result from loss of blood (hypovolemic shock), a failing heart (cardiogenic shock), or neurologic messages dilating the blood vessels causing the blood pressure to drop (neurogenic shock).

Shock is categorized three ways:

- Compensated shock: the body can correct for some of the deficiencies of the hypoperfusion
- Decompensated shock: compensation no longer possible, crash immanent
- Irreversible shock: irreparable damage to organs

The best way to manage shock is to prevent it. Keep the patient well oxygenated, warm, and lying in the recovery position, if possible. If the patient is having trouble breathing, a sitting position may be preferred (Fowler’s position). If circulation is a concern, as in the case of syncope, an elevated leg position (Trendelenberg position) may be required.

Never move patients with potential spinal injuries in a stable scene.

The “golden hour” is defined as the 60-minute time period from point of the injury discovery injury until care is transferred to the hospital staff. Getting the casualty stable and to the hospital within this interval offers the best chance for recovery.

Arterial bleeding is characterized by its bright red color (oxygenated blood) and its pulsating flow which coincides with the heartbeat. Capillary bleeding is slow and oozing. Venous bleeding is recognized by a steady flow and maroon or bluish color (deoxygenated blood).

A gloved hand can pass around the head, under the neck, and over all surfaces of the body. The examiner can inspect the gloves to identify an area where bleeding control is necessary. The loss of one liter of blood is considered serious in an adult (6 quarts total=4,200 liters). The loss of 500 cc (2 pints) is considered serious in a child (3 quarts total=3,000 liters). In an infant (total volume of 800 cc), losing a mere 150 cc is critical.

Bleeding control should be accomplished in stages:

**STEP 1**

The first step is the application of a direct pressure dressing in the position where the injury was found. While elevation used to be a staple, it is no longer performed because it was found to cause unintended consequences. If blood soaks through the initial dressing, apply additional dressings on top of the first dressing. Once applied, a pressure dressing should not be removed in the field.

**STEP 2**

If Step One is not adequate, the next step is compression of the major vessel of supply. This activity is discourages for untrained persons. In the arms, the brachial arteries can be compressed against the humerus. In the legs, the femoral arteries can be compressed against the femur or in the region of the pelvis.

**STEP 3**

3. When Steps One and Two fail, apply a tourniquet. Tourniquets are a last resort and should be considered only when the situation has become life threatening. Once applied, they should not be removed in the field.

Internal bleeding may be marked by rigidity of the abdomen, lapsed consciousness, cool clammy skin, nausea, low blood pressure, thirst and or altered mental status.

Stay current

An OD with a basic understanding of first aid and the steps to initiate can become an effective EMS team member in an ophthalmic emergency care in or out of her office when professional responders are not present.
One of my patients, a 20-something nurse who works long hours in a cool, dry assisted living facility, complained to me that, long before the end of her shift, her contact lenses grow too uncomfortable to continue wearing. I asked if she wanted to switch to daily disposables, but she preferred to continue with a monthly replacement schedule, having worn monthly replacement lenses most of her life. Another patient—a 17-year-old young man new to contact lenses—only stopped using his smartphone long enough for me to examine his eyes, telling me he needed to finish his homework before basketball practice later that evening. When I asked how much time he spent using the phone each day, he barely hesitated before telling me, “Almost all the time, except during practice.”

I often hear of similar patient experiences. A large percentage of my patients are students and young professionals who lead very active lives, often involving intense, prolonged concentration on digital devices, long hours working or studying, extra-curricular sports/exercise, and full social schedules. Demanding visual activities, though, can stress the contact-lens–wearing eye by destabilizing the tear film, which in turn can contribute to contact-lens–related dryness and discomfort. My nurse patient was already complaining of limited comfortable wear time, and I knew that the student’s digital use could lead to a poor experience if not in the right lenses. Both cost-conscious patients wanted a monthly replacement lens that provides exceptional comfort and vision throughout the day, each day for the full wear period.

The solution for both was AIR OPTIX® plus HydraGlyde® contact lenses, my go-to choice for patients who prefer a monthly-replacement schedule. These lenses incorporate two unique technologies—SmartShield® for excellent deposit resistance1 and the HydraGlyde® Moisture Matrix wetting agent—into one outstanding lens. AIR OPTIX® plus HydraGlyde® contact lenses have demonstrated excellent lens-surface wettability and tear film stability in laboratory and clinical studies.1,2

Additionally, HydraGlyde® Moisture Matrix technology is also found in CLEAR CARE® PLUS Cleaning & Disinfecting Solution and OPTI-FREE® PureMoist® Multi-Purpose Disinfecting Solution. Using either of these solutions daily can maintain the lens surface-moisture benefits of AIR OPTIX® plus HydraGlyde® contact lenses—with supporting outstanding comfort and excellent vision from Day 1 to Day 30 (Figure 1).3 And the nurse, who needed more comfortable wear time during her long work shifts, was pleased to hear that these HydraGlydeo®-containing lens care solutions increased hours of comfortable wear in symptomatic AIR OPTIX® lens wearers, compared to habitual multipurpose solutions.3,4

Patient preference plays a strong role in lens choice, and in another recent survey, 4X as many patients preferred AIR OPTIX® plus HydraGlyde® versus their habitual lenses after trying them for 1 month.5 Since the cost of premium daily disposables may be prohibitive to cost-conscious patients like students and young professionals, the trick is to find a monthly replacement lens that can offer them that “Wow!” factor. For my patients, that monthly replacement lens is AIR OPTIX® plus HydraGlyde®. With excellent lens surface wettability supporting outstanding tear film stability,6 AIR OPTIX® plus HydraGlyde® lenses—paired with daily use of either CLEAR CARE® PLUS Cleaning & Disinfecting Solution or OPTI-FREE® PureMoist® Multi-Purpose Disinfecting Solution—offer my young, digitally connected patients month-long comfort and vision that keeps up with their active lifestyles,7 helping them to see, look and feel their best!
Doctors interested in additional training for themselves—or their staffs—can take in-person or online first aid classes through the American Red Cross and similar organizations.

REFERENCES

Dr. Gurwood is a member of the clinical staff of Albert Einstein Medical Center, department of ophthalmology. His areas of active research include diseases of the anterior and posterior segment. He is a retired suppression firefighter and EMT. He is a retired faculty member of both Bucks and Montgomery County Public Safety Training Centers, Bucks and Montgomery Counties, PA. In his free time, he likes to participate in competitive sports and play guitar. agurwood@salus.edu.

ProQR receives license for retinitis pigmentosa therapy

LEIDEN, THE NETHERLANDS—ProQR Therapeutics N.V. announced the signing of an agreement with Ionis Pharmaceuticals to license QR-1123 (formerly “IONIS-RHO-2.5Rx”), an RNA medicine for autosomal dominant retinitis pigmentosa (adRP) caused by the P23H mutation in the rhodopsin (RHO) gene.

Says Daniel A. de Boer, chief executive officer of ProQR: “QR-1123 is a gampier with a mutant allele-specific knockdown mechanism of action. If validated, it would further broaden the potential of RNA-targeted therapies in retinal diseases.”

Under the terms of the agreement, ProQR was granted an exclusive worldwide license to QR-1123 and relevant patents. ProQR made an upfront payment in ordinary shares in the aggregate amount of $2.5 million, at $22.23 per share, which represents a 20 percent premium to its common stock, to Ionis upon signing the agreement.

ProQR will also make future milestone payments and royalties on net sales of 20 percent through the royalty term.

ProQR expects to start a Phase 1/2 clinical trial in patients with adRP in 2019, pending submission and clearance of the IND application by the U.S. Food and Drug Administration (FDA).

“QR-1123 is an antisense oligonucleotide we designed to specifically target only the mRNA from the disease-causing rhodopsin gene, which has a single nucleotide P23H mutation, while preserving expression of the mRNA from the normal rhodopsin gene, which is important for the eye to function properly,” says Brett P. Monia, PhD, chief operating officer and senior vice president of translational medicine at Ionis.
Costa launches frame line using recycled fishing nets

DAYTONA BEACH, FL—Every year, the amount of discarded fishing nets and gear polluting the oceans grows by 640,000 tons. In an effort to help clean up the waters, Costa announces a new line of eyeglass frames that offer an ecologically sustainable frame using recycled nylon fishing nets: the Costa Optical Untangled Collection.

The new frame line features recycled nylon from Bureo at the brow accents and temple sleeves over a streamlined stainless-steel chassis for a seamless modern look.

The new line continues Costa’s partnership with Bureo, a company working with fishing communities to recycle discarded fishing nets into a variety of quality products.

Costa Optical Untangled frame styles feature PLUSfoam Hydrolite rubber, which is a recycled material. At the end of the product’s life, the entire frame can be shipped into the PLUSfoam organization to be recycled (PLUSfoam.com/reclaim) and includes PLUSfoam Hydrolite rubber on the temple tips.

Like all Costa Optical cases, the soft pouches and cork cases for the Costa Optical Untangled Collection are fully biodegradable.

A classic rectangular eye shape, Untangled Collection 100 contrasts textured, recycled nylon on the brow bar and temples with three different colors of the adjustable stainless steel metal bridge, lower rim, and front temple. Each color features vibrant PLUSfoam Hydrolite rubber on the temple tips. Color combinations include matte black metal with gray rubber temple grips, shiny brushed light gunmetal with royal blue rubber temple grips, and matte brushed gold metal with burgundy rubber temple grips.

Untangled Collection 110 features a female cat-eye shape accented on the upper brow line and temples with textured, recycled nylon from discarded fishing nets, as well as pops of color on the temple tips with textured PLUSfoam Hydrolite rubber. The rubber color pairs three different colors of stainless steel metal on the bridge, lower rim, and front of the temples, including shiny brushed gold metal with teal rubber temple grips, matte brushed rose gold metal with red rubber temple grips, and matte brushed light gunmetal with royal blue rubber temple grips.
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PROVIDE OPTOMETRY CARE TO COMMUNITIES IN KENYA
Leverage your professional expertise and skills by making a difference in the world. Travel on a fully funded ME to WE Trip to rural Kenya to help transform eye care for thousands of adults and children in our charity partner’s communities. In collaboration with ME to WE Trips, the Passion to Heal℠ initiative funds the cost of these medical volunteer trips, supported by Valeant Pharmaceuticals NA LLC (VPNA).

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Moncler Lunettes add sporty, duvet, and timeless frames

The new Moncler Lunettes sunglass and optical collection is divided into three segments:
• Sport, which comprises eyewear designed for the mountains but also suitable for city life
• Duvet, which features iconic innovative frames, aesthetic functionality, and technological research in line with the brand’s heritage
• Timeless, which features classic, retro-inspired shapes

Attention to detail distinguishes each model, with square or round frames featured alongside graphic styles designed for an active lifestyle.

Sunglass collection

ML0054

Unisex sport sunglass frames feature a shape reminiscent of classic pilots. The frame front is structured around a single lens on which injected material is applied following the edges along with thin temples.

ML0053

Athletic-style men’s sunglass frames combine a sporty frame front with thin, cylindrical temples, complete with built-in Moncler-logo hinges. The single lens is outlined with injected material, which defines cut-outs on the top of the frame front.
**Optometry Times | PRACTICAL CHAIRSIDE ADVICE**

**InDispensable**

**ML0063** reminiscent of Moncler Longue Saison, one of the brand’s classic models, features fully injected unisex sunglass frames. The lens is secured with small screws on the frame front. The Moncler logo is featured on the temples.

**ML0064** is functional, practical, and lightweight; these unisex sunglasses with their classically round frame suit any look. The lenses are secured onto the injected structure with small, invisible screws. The injected temples are finished with the Moncler logo and small cut-outs near the rubberized temple tips.

**Optical collection**

**ML0064** features a “petit” concept for the essential shape of this feminine, acetate optical model. These glasses stand out for their bold edges and their duvet surface, reminiscent of the brand’s padded jackets.

**ML5032** This classic men’s optical model with an acetate pilot shape falls within the “timeless” category. The metal and acetate temples are equipped with built-in hinges featuring the Moncler logo.
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Cornea, almost two residencies, and a Vietnamese hoagie

Why did you go to school in the U.S., and why did you decide to stay? I knew I wanted to do something in health care, so, I decided to find jobs in different health clinics and see which I liked the most. I ended up staying at an optometry clinic in Vancouver for several years. Hanif Paroo, OD, stood out for me there, and I had lot of after-hours inspirational conversations with him. I thought if I could become anywhere close to the type of doctor he is, I would be happy. His alma mater Salus University was my first choice. When I graduated, I did a residency in primary care, then afterward I obtained a fellowship in cornea and contact lenses in Teaneck, NJ. I stayed in that clinic for close to nine years.

Why academia and not private practice? If I had gone back to Canada after my residency, I would have enjoyed private practice. I remember that my mentors told me the best way to learn is to teach. [Laughs] The longer I stayed in an academic setting, I realized it was true. I enjoy being able to process material that may not be digestible for other people, then transfer it in a simpler content to see other people learning with me. That is very gratifying, and I’m not sure I would get that in private practice.

How did you develop your lecture style? I’m really prepared with my content, but I was never quite prepared with my style. I didn’t have enough time to take care of both; I could focus only on new information that I want to share with colleagues. I let whatever feels natural to me come to the podium. Some people love me, some people don’t. I find it humbling to look at the course review because people care enough to give you constructive criticism. So when my delivery style comes from my personality, I kind of let it fly.

What’s something your colleagues don’t know about you? Optometry wasn’t my first choice—I wanted to go to culinary school. I thought if I couldn’t find a way to get into culinary school, I would then try optometry. [Laughs]

What’s your guilty pleasure food? A Vietnamese hoagie with spicy marinated vegetables on top, complimented with a cup of really dark, strong Vietnamese coffee laced with condensed milk.

Where do you see yourself 10 years from now? I can barely see myself a year from now. It’s hard to project that far ahead. In 10 years, I hope I slow down a little even though I’m not near retirement age. There has been a lot of travel in my career, which I appreciate, but it does take a toll. I would love to become a liaison between new research and my colleagues in our optometric community. I would love to continue to represent optometry.

What was the craziest thing you’ve ever done? I’ve always been told how crazy I am for wanting to do a residency, and afterward, still feeling like that wasn’t enough knowledge for me, wanting to go for more. I offered to do a second residency. It was shocking my friends who knew I was going to give up another two years of pay—did a two-year fellowship because one year wasn’t enough. [Laughs] —Vernon Trollinger

To hear the full interview with Clark Chang listen online: optometrytimes.com/ClarkChang
BRIEF SUMMARY:
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).

DOSEAGE 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 urticaire 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.
Xiidra may provide
LASTING RELIEF starting as early as 2 weeks

One drop in each eye, twice daily, about 12 hours apart. Discard the single-use container immediately after use.

Choose Xiidra first for patients with signs and symptoms of Dry Eye Disease

Xiidra reduced symptoms of eye dryness at 2 weeks in 2 out of 4 studies, and in all 4 studies at 6 and 12 weeks. Xiidra also improved signs of inferior corneal staining at 12 weeks in 3 out of 4 studies.¹

The safety and efficacy of Xiidra compared to vehicle were studied in 2133 patients in 4 well-controlled, 12-week trials.¹

Check it out at Xiidra-ECP.com

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.

Reference:
1. Xiidra (Prescribing Information). Lexington, MA: Shire US.

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5. In vitro study over 16 hours to measure wetting substantivity, Alcon data on file, 2015.

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