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Hailey's Brother

Mom's Manicurist

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IN THE NEWS

More women than men in the US have age-related macular degeneration, cataracts, glaucoma and diabetic retinopathy, according to a recent study by **Prevent Blindness America** (PBA). To educate women about the steps they can take now to help preserve their vision in the future, PBA has designated April as **Women's Eye Health and Safety Month**. "The first thing every woman should do, especially those ages 40 and older, is get a dilated eye exam," says Hugh R. Parry, PBA president and CEO. "Through early detection and treatment, vision loss can be lessened."

The FDA has approved **Prolensa** (bromfenac 0.07%, **Bausch + Lomb**) a once-daily **NSAID** indicated for treatment of postoperative inflammation and reduction of ocular pain in patients who have had cataract surgery. In two clinical trials, patients started on Prolensa one day before surgery, and continued it for two weeks after surgery. At one day post-op, about four out of five patients (79%) treated with Prolensa were pain free. By day 15, post-op inflammation was completely cleared in 46% of patients on Prolensa.

A bill in **Tennessee**, which would have allowed optometrists to **inject local anesthetics**, has been tabled until 2014. ODs in Tennessee have been licensed to perform minor procedures and injections for two decades, so this bill would not permit optometrists to perform any new procedures, stated the **Tennessee Association of Optometric Physicians**. It would only allow ODs to apply anesthetic by a different means. The legislature will likely revisit the bill during the new session next January.

Topical Eye Drop for AMD Works in Mice

Researchers have found a link between AMD and heart disease—and treated it. **By John Murphy, Executive Editor**

For years, researchers have been seeking a hard link between heart disease and age-related macular degeneration. But treatment—such as prescribing cholesterol-lowering statins to patients with AMD—has been disappointing.

Now, researchers at Washington University School of Medicine in St. Louis have found an important connection between AMD and atherosclerosis.[1] Better yet, they tested an eye drop in older mice that not only halted but also reversed choroidal neovascularization.

"We were able to deliver the drug, called an LXR agonist, in eye drops," says lead author Abdoulaye Sene, PhD. "And we found that we could reverse the macular degeneration in the eye of an old mouse. That's exciting because if we could use eye drops to deliver drugs that fight macular degeneration, we could focus therapy only on the eyes and we likely could limit the side effects of drugs taken orally."

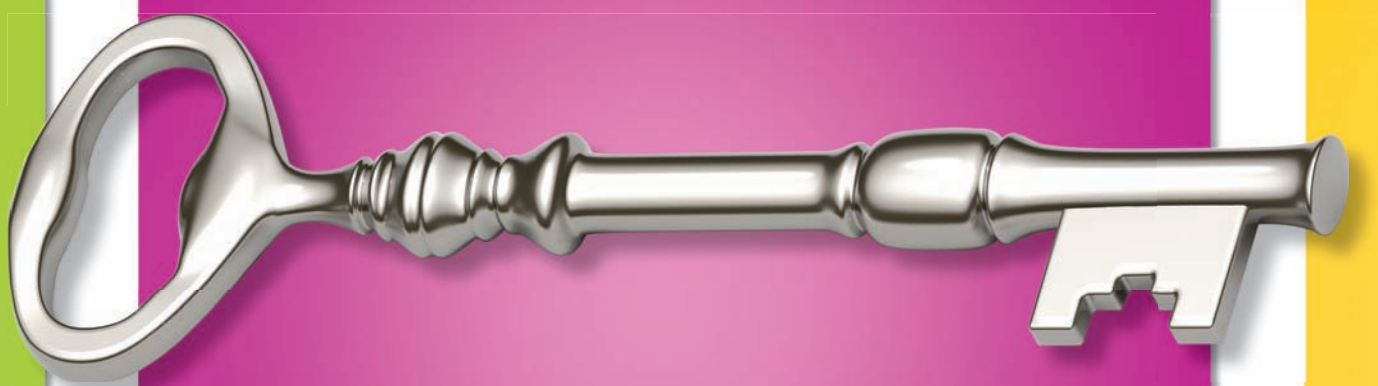
Both AMD and atherosclerosis have the same underlying defect: the inability to remove a buildup of fat and cholesterol. Researchers have been investigating whether cholesterol-lowering eye drops, or other medications that might prevent the buildup of lipids in the retina, could prevent vision loss caused by AMD.

In this study, the investigators focused on macrophages, immune system cells that remove harmful materials such as cholesterol and fats from tissues. The scientists found that macrophages in both old mice and in patients with AMD have inadequate levels of the protein ABCA1, which transports cholesterol out of cells. As mice and humans age, they make less of this protein, and macrophages become less effective at engulfing and removing fat and cholesterol. As a result, the old macrophages accumulate high levels of cholesterol and cannot inhibit the CNV that occurs with wet AMD.

But when the researchers treated the macrophages with LXR agonist, it boosted levels of ABCA1, so the cells removed cholesterol more effectively. It also slowed the development of new blood vessels.

"We have shown that we can reverse the disease cascade in mice by improving macrophage function ... with eye drops or with systemic treatments," says senior investigator Rajendra S. Apte, MD, PhD. "Some of the therapies already being used to treat atherosclerosis target this same pathway, so we may be able to modify drugs that already are available and use them to deliver treatment to the eye."

Sene A, Khan AA, Cox D, et al. Impaired cholesterol efflux in senescent macrophages promotes age-related macular degeneration. Cell Metab; 2013 Apr 2;17(4):549-61.



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Why We Should Accept the 'Olive Branch' from ASCRS

By Richard Edlow, OD

Last year, the American Society of Cataract and Refractive Surgery (ASCRS) announced plans to promote "an eye care delivery model based on a synergistic collaboration between optometry and ophthalmology." As part of this effort, ASCRS decided to allow some optometrists to join the organization and also included an educational track for ODs at its annual meeting, taking place April 19 to 23.

The only catch: To join ASCRS, the OD must be employed by an ophthalmologist, by industry or be a member of the military. Subsequently, many optometrists considered this a backhanded insult, and a collaborative effort in name only.

Dr. Edlow, one of five optometrists on the task force, explains the ultimate need for this project:

Optometrists and ophthalmologists work together under the same roof with increasing frequency. Most often, the collegial working relationships are the result of market forces and just plain common sense.

Historically, the same cannot be said of the relationships on the state and national levels, where bickering and disagreement have existed for decades over which class of professionals should provide which services. What comes to mind is the lack of agreement on issues and the drawing of lines in the sand that we observe amongst our representatives in Congress—a clear example of little to no progress at the expense of the average citizen.

Recently, as many of the national leaders in eye care have realized, the increasing demand for eye care services is being met by a flat to declining workforce of eye doctors. Thus, for the overall benefit of the average citizen, optometry and ophthalmology must find ways to work together cooperatively in a more efficient and productive model.

I was asked to participate in the ASCRS Integrated Ophthalmic-Managed Eyecare Delivery Model (IOMED) Task Force and readily accepted the challenge. This has not been without controversy, as participation in the ASCRS IOMED program has been limited to optometrists who are employed by an ophthalmologist, the military or industry.

My perspective is quite simple: You have to start somewhere. Ignoring the "olive branch" does nothing positive in my mind and, in the long run, the marketplace will work its magical wonders to determine how optometrists and ophthalmologists should structure their professional working relationships.

In the meantime, the more collaborative efforts there are, the better. Who knows, perhaps someday optometrists and ophthalmologists may all be members of the "American Association of Eye Care Providers"?

Glaucoma Drug Moves to Phase III

An experimental glaucoma drug, BOL 303259-X (Bausch + Lomb), reduces intraocular pressure as well as or better than latanoprost, according to results released at last month's American Glaucoma Society meeting, in San Francisco.

In the Phase II clinical trial, researchers evaluated 413 patients with open-angle glaucoma or ocular hypertension. The patients were randomized to one of four once-daily BOL 303259-X groups (0.006%, 0.012%, 0.024% or 0.040%) or a once-daily latanoprost group. The patients' IOP was assessed seven times during a 28-day dosing period.

At the study's conclusion, the researchers found that patients in the BOL 303259-X 0.024% group had a mean IOP reduction of 9.0mm Hg, compared with a decrease of 7.8mm Hg in those treated with latanoprost.

"We found that the optimal dose of the drug produced a significantly greater reduction in intraocular pressure than latanoprost at 28 days, but with a similar side-effect profile," said researcher Robert N. Weinreb, MD, chairman and distinguished professor of ophthalmology at the University of California, San Diego, and consultant for Bausch + Lomb. "Based on these data, a Phase III clinical trial program has been initiated."

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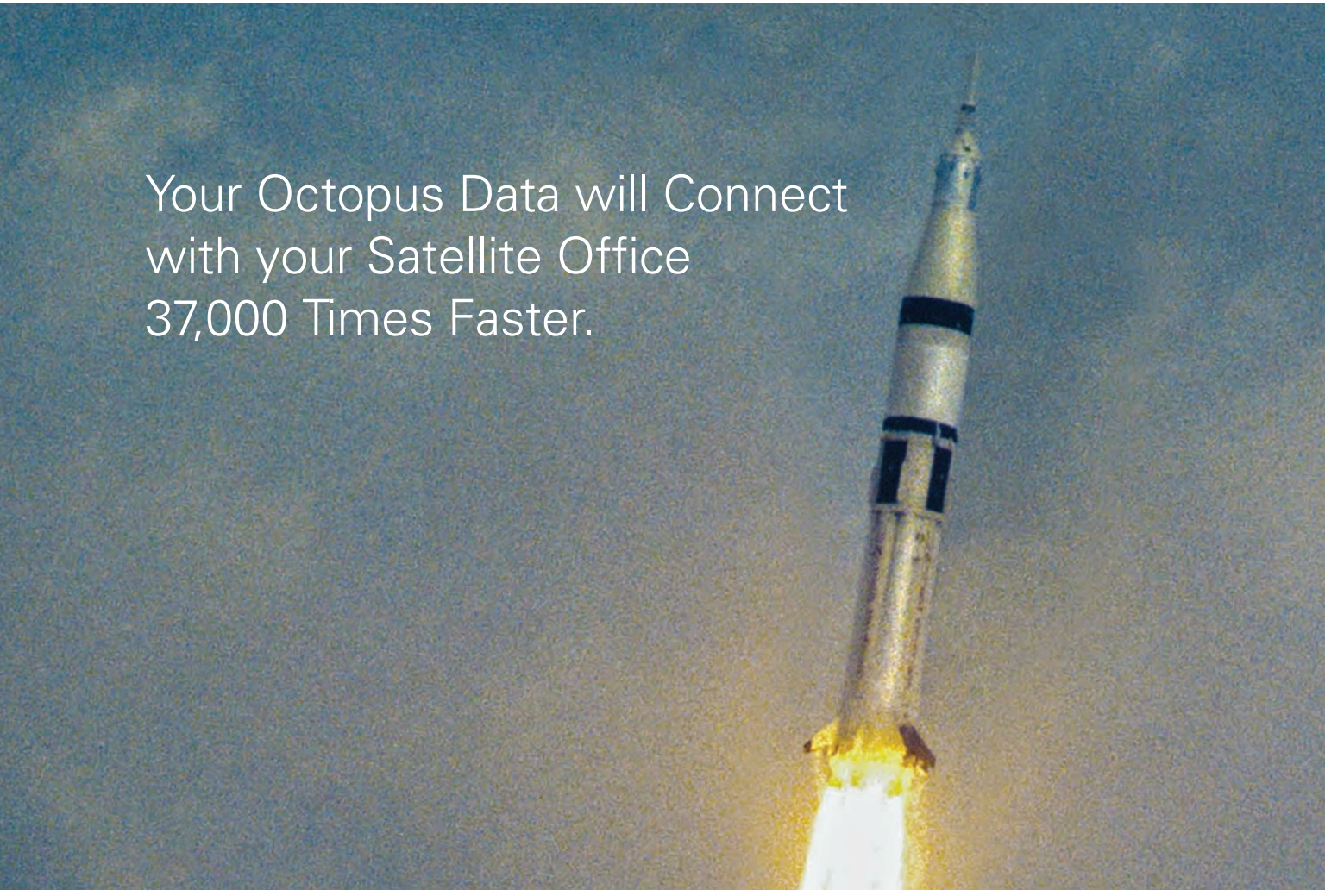

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SECO 2013 Celebrates 90 Years of Education

This year's annual SECO congress in Atlanta offered something "old" and a wealth of what's "new." The new was, of course, the latest in continuing education courses—from scleral lens classes to injection workshops, from diabetes courses to experts offering their insights on femtosecond lasers. As for the "old," SECO 2013 provided a compelling walk down memory lane as SECO celebrated its 90th anniversary and nine decades worth of milestones as a leader in optometric education.

At SECO 2013, Jimmy D. Bartlett, OD, Paul Ajamian, OD, and Louis Catania, OD, took a look back and a look ahead at optometrists' involvement with therapeutics.

The meeting, held February 27 to March 3 in Atlanta, kicked off with a tribute to two optometric pioneers—Lou Catania, OD, and Jimmy Bartlett, OD, DOS, ScD—who played a major role in shaping optometric scope of practice and continuing education. SECO CE Chairman Paul C. Ajamian, OD, moderated this memorable session, "Therapeutics: A Look Back, A Look Forward."

"We now practice in a profession where topical and oral medications are used routinely," Dr. Ajamian told the packed crowd. "We practice in a profession where in Kentucky, West Virginia and Oklahoma, optometrists can use lasers and perform minor procedures. We practice in a profession where we are finally valued and recognized as primary eye care providers."

But, it wasn't always that way, Dr. Ajamian recalled. "I remember when we were excluded from the Medicare program. I remember when the Mydriacyl and proparacaine were locked in cabinets at school, and we had to refer to ophthalmology to use them. I remember sneaking antibiotics into tear bottles to treat the dreaded pink eye. I remember when surgery patients were referred out and never came back. I remember thinking that the only lectures I would ever hear on ocular disease would be given by ophthalmologists."

When Dr. Catania took the podium, he quipped, "The only thing worse than an old man reminiscing is *two* old men reminiscing." But, in looking back, he reminded the audience of optometry's

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SECO Marks 90 Years of Education

Continued from page 8

"inferiority complex" in the 1970s and 1980s—and how much things have changed since.

When Dr. Bartlett spoke, he acknowledged that, in some ways, things haven't changed enough. He urged the audience, "Don't be timid about using steroids. QID is not enough! The more frequently you dose the steroid, the greater the anti-inflammatory effect."

The Education Destination

Along with Drs. Catania and Bartlett's stellar presentation, SECO 2013 also featured more than 240 continuing education courses, more than 100 world-renowned speakers, and nearly 300 industry-leading companies.

The OD program featured 109 courses, including three symposia, seven joint-education courses and a special course titled "Teaming Up with Pediatric Ophthalmology."

The Allied Ophthalmic Professionals (AOP) program included 132 courses, including seven review sessions and the fifth annual AOP General Session.

SECO launched a new audience-interaction innovation this year during the special session "Refractive/Cataract Surgery: The Future Revealed," which featured Paul Karpecki, OD, Jason Brinton, MD, and Tyrie Jenkins, MD. During the session, each audience member had a remote control device they used to weigh in on several poll questions posed by Dr. Karpecki, while the expert panel discussed cutting-edge laser procedures and surgical techniques.

Another SECO 2013 highlight was the special session "Hot Topics in Glaucoma: Burning Questions Answered," with Michael Chaglasian, OD, John Flanagan, BSc, PhD, MCOptom, and Leo Semes, OD. The course covered the most current topics in glaucoma diagnosis and treatment, including using technology to detect glaucoma progression and exploring the relationship between intraocular pressure, ocular perfusion pressure and cerebrospinal fluid pressure.

Incoming SECO President Darby Chiasson, OD, and Immediate Past President Ron Foreman, OD, cut the ribbon to open the exhibit hall, Optometry's Marketplace.

SECO 2013 offered something for everyone, including the popular special session "The Peripheral Retina: Front and Center," presented by Anthony A. Cavallerano, OD, and Steven Ness, MD. These two retinal experts shared their insight on causes of retinal detachment and proper management of the patient presenting with risk factors for retinal separation.

Another SECO 2013 crowd favorite was "Is There a Subspecialist in the House?" with Joseph Shovlin, OD, and colleagues Thomas Boland, MD, Arthur Jordan, DO, and John Lee, MD, of the Northeastern Eye Institute of Scranton, Pa. The doctors presented treatment options for a variety of subspecialties including neuro-ophthalmology and cornea/anterior segment disease, including medications for neurologic conditions, intravitreal devices/implants for drug delivery, collagen cross-linking for corneal conditions, and new techniques in lamellar surgery.

Of course, a SECO Congress would not be complete without Optometry's Marketplace, which featured some 300 companies showcasing new trends and the most recent product introductions and technologies in one expansive exhibit hall.

Last but not least, SECO and the Armed Forces Optometric Society teamed up to allow uniformed service members an opportunity to attend SECO 2013 for free. The two organizations made this decision after learning that AFOS members would have had to pay out of pocket to attend SECO because of unexpected federal budget cuts.

London Calling

Mark your calendars for October 6 when SECO, along with the UK's Association of Optometrists, will host a joint education meeting at the AOP headquarters in London. The meeting will feature 12 hours of CET and COPE-approved continuing education as well as a guest program, networking events and plenty of opportunities to see England's capitol city. For more information, visit www.secointernational.com/london-2013.html.

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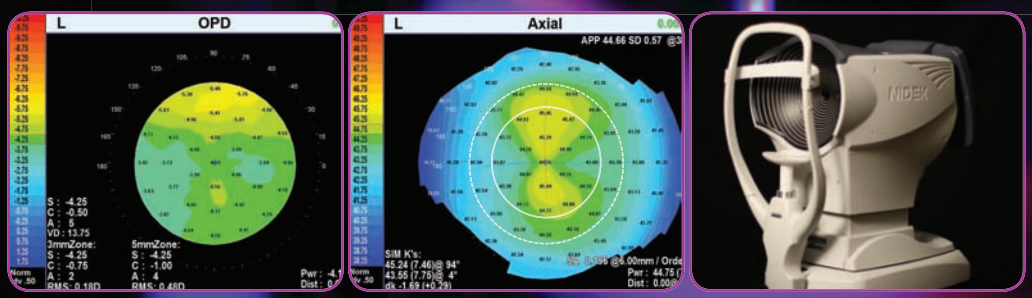

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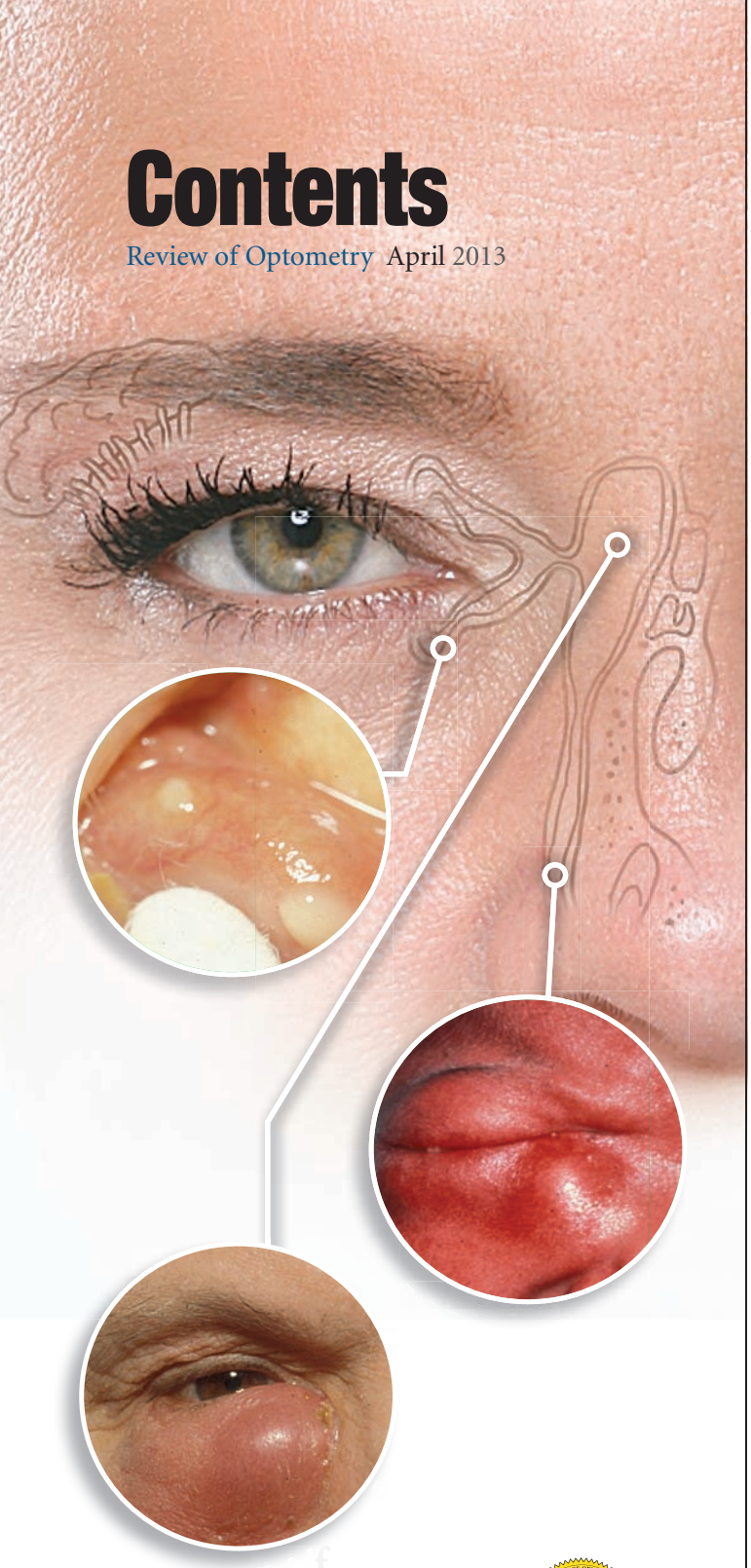

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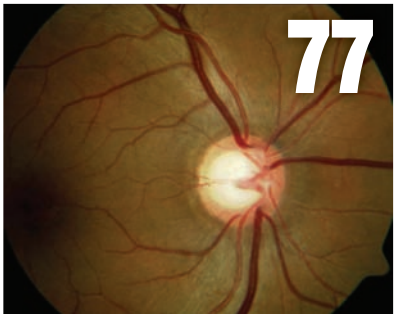

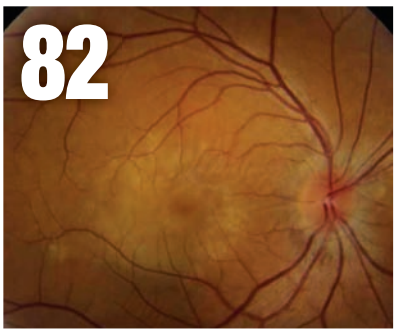

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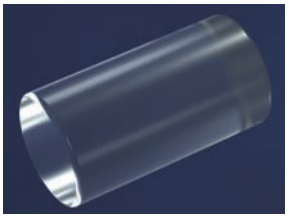

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† In most patients, one LACRISERT® placed into each eye once daily is effective in providing all-day symptom relief. Some patients may require twice-daily use for optimal results.

Please see Brief Summary of Prescribing Information on adjacent page.

Reference: 1. Koffler BH, McDonald M, Nelinson D, Improved signs and symptoms and quality of life with dry eye syndrome: hydroxypropyl cellulose ophthalmic insert patient registry. *Eye Contact Lens.* 2010;3:170-176.

Bridgewater, NJ 08807 LAC102-0512ROPT

Brief Summary of Prescribing Information

ATON PHARMA

ATON Pharma, a Division of Valeant Pharmaceuticals North America LLC
Madison, NJ 07940

Rx Only

LACRISERT® (hydroxypropyl cellulose) OPHTHALMIC INSERT

DESCRIPTION

LACRISERT® Ophthalmic Insert is a sterile, translucent, rod-shaped, water soluble, ophthalmic insert made of hydroxypropyl cellulose, for administration into the inferior cul-de-sac of the eye.

Each LACRISERT is 5 mg of hydroxypropyl cellulose. LACRISERT contains no preservatives or other ingredients. It is about 1.27 mm in diameter by about 3.5 mm long. LACRISERT is supplied in packages of 60 units, together with illustrated instructions and a special applicator for removing LACRISERT from the unit dose blister and inserting it into the eye.

INDICATIONS AND USAGE

LACRISERT is indicated in patients with moderate to severe dry eye syndromes, including keratoconjunctivitis sicca. LACRISERT is indicated especially in patients who remain symptomatic after an adequate trial of therapy with artificial tear solutions. LACRISERT is also indicated for patients with exposure keratitis, decreased corneal sensitivity, and recurrent corneal erosions.

CONTRAINDICATIONS

LACRISERT is contraindicated in patients who are hypersensitive to hydroxypropyl cellulose.

WARNINGS

Instructions for inserting and removing LACRISERT should be carefully followed.

PRECAUTIONS

General

If improperly placed, LACRISERT may result in corneal abrasion.

Information for Patients

Patients should be advised to follow the instructions for using LACRISERT which accompany the package.

Because this product may produce transient blurring of vision, patients should be instructed to exercise caution when operating hazardous machinery or driving a motor vehicle.

Drug Interactions

Application of hydroxypropyl cellulose ophthalmic inserts to the eyes of unanesthetized rabbits immediately prior to or two hours before instilling pilocarpine, proparacaine HCl (0.5%), or phenylephrine (5%) did not markedly alter the magnitude and/or duration of the miotic, local corneal anesthetic, or mydriatic activity, respectively, of these agents. Under various treatment schedules, the anti-inflammatory effect of ocularly instilled dexamethasone (0.1%) in unanesthetized rabbits with primary uveitis was not affected by the presence of hydroxypropyl cellulose inserts.

Carcinogenesis, Mutagenesis, Impairment of Fertility

Feeding of hydroxypropyl cellulose to rats at levels up to 5% of their diet produced no gross or histopathologic changes or other deleterious effects.

Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

Geriatric Use

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

ADVERSE REACTIONS

The following adverse reactions have been reported in patients treated with LACRISERT, but were in most instances mild and transient: transient blurring of vision, ocular discomfort or irritation, matting or stickiness of eyelashes, photophobia, hypersensitivity, edema of the eyelids, and hyperemia.

DOSAGE AND ADMINISTRATION

One LACRISERT ophthalmic insert in each eye once daily is usually sufficient to relieve the symptoms associated with moderate to severe dry eye syndromes. Individual patients may require more flexibility in the use of LACRISERT; some patients may require twice daily use for optimal results.

Clinical experience with LACRISERT indicates that in some patients several weeks may be required before satisfactory improvement of symptoms is achieved.

Issued June 2007

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by Ron Melton, O.D., and Randall Thomas, O.D.

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1. DEWS Report, The Ocular Surface, April 2007: 164,86
2. Modified from Gilbard JP, Rossi SR, Ophthalmology, Apr 1992, 99(4): 600-4
3. DEWS Report, The Ocular Surface, April 2007: 164

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Take a Systematic Approach to Eye Care

For Whom the Bell Tolls

It tolls for your contact lens practice—if you can't keep presbyopes wearing lenses!

By Jack Persico, Editor-in-Chief

I got an unwelcome present for my 44th birthday: presbyopia. Yes, the classic arms-too-short scenario started to happen often enough that I could no longer avoid it. Having worn contacts since age 20, I was reluctant to give them up. Glasses are too visually distracting, especially while driving—the loss of peripheral vision has always been a deal-breaker to me. And as someone who tends to watch TV with an iPad on my lap, I especially found it fatiguing to shift focus so often between the two screens (my eyes couldn't keep up with my ADHD). Lastly, in my line of work, I do a whole lot of near-vision tasks.

So, I had three specific real-world visual scenarios in mind when I went to my optometrist. Your patients' issues may differ from mine, but the transition into presbyopia is not a pleasant experience. For many people, it's their first age-related change of any kind—and, for that reason, patients are highly motivated to make it go away.

As contact lens specialists discuss this month (*see "The Multifocal Contact Lens Market: It's Yours to Lose," page 42*), the opportunity to better serve this patient group is often literally right in front of you. Unfortunately, the view from the other side of the slit lamp is that we emerging presbyopes are more enthusiastic about this than you are.

Although multifocal lens designs have improved considerably, eye care professionals still consider them the redheaded stepchild of the family far too often. When presbyopic contact lens correction is brought up, it's usually monovision that gets the attention, because it's considered easier for the practitioner and cheaper for the patient. That deference to our wallets is certainly appreciated, but I speak for many of my brethren when I say I'd be glad to pay more for a better product, particularly given that monovision is a stop-gap measure. Once the presbyopia advances, patients have to abandon it—and contact lens wear too. By then, the transition to multifocals will be too hard. But those who start adapting to multifocals early on can gradually progress with them as their presbyopia does.

Flip to page 46 and look at the graph of contact lens wear among different age cohorts. It traces a (somewhat misshapen) bell curve with a peak in the early-30s group, followed by an inexorable decline to zero as age progresses. For whom does this bell toll? For thine contact lens practice, if you let these trends continue without intervention.

Everyone knows the aging of the population is transforming the demographics of optometric practices. Expect the proportion of your traditional contact lens-aged patient base to shrink as a consequence.

Industry research shows that 16% of contact lens wearers drop out every year—and this has held steady for the last 20 years, despite improvements in technology along the way. The number one reason is discomfort, an obstacle strongly correlated with poor compliance. So the first order of business is to be more forceful in your policing of lens wear-and-care habits. But getting more attuned to the visual demands of presbyopes runs a close second in terms of priorities.

The 16% of patients who drop out every year have been replaced by, coincidentally, the same amount of new lens wearers each year. But this parity between those entering and those exiting won't last forever. You'll end up working harder to replace a growing number of patients with a shrinking base of new recruits. Meanwhile, a huge group of patients will be deprived of a correction they'd clearly desire.

What to do

First, master the techniques. Fitting multifocal contact lenses is a bread-and-butter optometry service that needs to be a part of your everyday repertoire. If not you—who? Opticians can't, and ophthalmologists don't want to bother.

Second, get over any hang-ups about price-sensitive patients. We emerging presbyopes don't mind paying for value. Identify the specific visual tasks that concern your patient the most, and direct the conversation to how you can help.

Lastly, be enthusiastic! If you discuss presbyopia in the grave tones of a cancer diagnosis, patients will get apprehensive and bail. Tell patients all about the compromises, of course. But then flaunt your unique abilities to help us put off, a wee bit longer, our need to acknowledge the aging process. Trust me, we'll be glad to play along. ■

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Let Me Look Into Your Eyes

Who would you trust with your most precious gift? No, I'm not talking about your Xbox! I'm talking about your vision. Now go get an eye exam. **By Montgomery Vickers, OD**

When was your last eye examination, doctor? I know…87.6% of you have just turned the page to read something important—like how to improve employee morale with a virtual cotton candy station in the lounge, as required by Obamacare. But for you few hardy souls still on this page, I want to help you understand that eye examinations are an important part of anyone's health care—eye doctors included.

My expert research team has determined that, out of 100 optometrists, only 12.3% get a yearly eye examination. (Twelve percent is bad enough, but I was confused by the remaining 0.3%—until I met this guy at a recent meeting who seemed to be only one-third there. He'll move up now that I've explained a PD rule to him.)

So why haven't you had your eyes examined? It's very easy to get a convenient appointment with a trusted colleague. All you do is call him or her at home and threaten to accept another vision plan unless they meet you on a Saturday at their office. So, getting the appointment is the easy part.

Getting a decent eye examination is the hard part. I mean, they kinda know how to give a decent eye exam, even though you know they are idiots. But by the time you show up and hang out (dissing the other eye guys in town), you might be lucky to get a perfunctory, "Which is better, one or two?"

Deep down inside, they could care less if you can see the big E.

Now, they like you all right and they want you to have a wonderful, nice, healthy and happy life. But they really wish you weren't a block away from where they are trying to have their own wonderful, nice, healthy and happy life. Perhaps shorting you on your near add would sway the balance of power?

The good news is they do want to dilate your pupils—so you can't see patients that day. The best revenge is to put them on your recall system and then insist they come in every year so YOU can check THEIR eyes. Now, who's laughing, Dr. Overrefraction? He who laughs first gets 10% atropine last!

Treat Your Staff...to an Exam

OK, by now, you've probably scheduled your own next eye examination with the cheesy doctor across town, plotting how to test his retinoscopy skills and to steal his best employee or something. That's all good, but what about your own staff members? Have you checked their eyes lately?

I don't mean when they say their eye itches and you give them a sample artificial tear. I mean a real exam, the kind you give that patient of yours who works for the meanest lawyer in town. How are you going to show your staff that eye health and vision is important if you don't really check them out?

I know, you're busy all day long. If you are, then you're the first eye doctor in the country with that problem. You can see them at the end of the day. How about that?

Everyone needs a good eye examination. Even you. Even me. Even your best friend. Even your worst enemy. The last two could be the same guy some days.

If you need an exam, and you're afraid of your colleagues, you can come down to my office. Not only do I have 34 years of experience, I also am HIPAA compliant, so I won't put your IOPs on Facebook.

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[1]Bergmanson J. Clinical Ocular Anatomy and Physiology, 14th ed. Houston , Texas: Texas Eye Research and Technology Center, 2007.

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Whoa, Not So Fast!

A new policy change allows OCT and fundus photography to be performed on the same day. But is there a catch? **By John Rumpakis, OD, MBA, Clinical Coding Editor**

Whether the rules work for us or against us, there is usually very little gray between the black and white of interpretation.

But it's those gray, in-between situations that worry me the most.

I bring this up because of a very timely change in policy—and a new gray area. As you know, the use of OCT and fundus photography performed on the same date of service on the same eye has always been considered "mutually exclusive"—thus, not allowed—according to the National Correct Coding Initiative (NCCI). This is defined as "procedures that cannot reasonably be performed at the same anatomic site or same patient encounter."[1]

Many (yours truly included) have questioned the logic of this particular pairing. I can understand the genesis of the rule, because when Scanning Computerized Ophthalmic Diagnostic Imaging (SCODI) came on the scene in 1999, many of the outputs from the various instruments were very similar to fundus photographs. Needless to say, there have been significant changes to today's SCODI technology that now clearly differentiate it from a fundus image. But, the rules have lagged behind, so it has remained inappropriate to perform both on the same day of service on the same patient.

Until now…

The 2013 NCCI policy manual includes a change to this rule: "Fundus photography (CPT code 92250) and scanning ophthalmic computerized diagnostic imaging (CPT code 92135) are generally mutually exclusive of one another in that a provider would use one technique or the other to evaluate fundal disease. However, there are a limited number of clinical conditions where both techniques are medically reasonable and necessary on the ipsilateral eye. In these situations, both CPT codes may be reported appending modifier -59 to CPT code 92250."[1]

Not 'Mutually Exclusive'?

Now, ignoring the fact that this 2013 rule still uses the CPT code 92135 for SCODI that was retired on January 1, 2011 (and replaced with 92133 and 92134), this is a significant change in policy.

But, whoa, not so fast! What I fear is that everyone will rush into doing these procedures together on the same date of service, just because of a change in the rule.

Let's consider a couple areas that could be problematic.

- ***Which diagnoses are allowed?*** The policy manual includes no national list of these "limited number of clinical conditions." The closest thing that I can find is a list of diagnoses that are allowed in the state of Florida, where this policy has been in place for a few years. Most of the diagnoses allowed in Florida are related to retinal disease; however, glaucoma is *not* included.
- ***Where does the -59 fit in?*** The definition of modifier -59 is very specific and should not be taken lightly, as it is an often misused (overused) modifier that can raise the scrutiny of insurers and the Office of the Inspector General.

Modifier -59 is defined: "Distinct Procedural Service: Under certain circumstances, the physician may need to indicate that a procedure or service was distinct or independent from other services performed on the same day. Modifier -59 is used to identify procedures/services that are not normally reported together, but are appropriate under the circumstances."[1]

Modifier -59 is generally used as a modifier of last resort, when no other modifier fits the situation at hand. This NCCI policy specifically states to use modifier -59, so at least a reference exists should a claim get called into question.

While insurance coverage policies and rule sets typically lag the development and adoption of technology in our practices, it's nice when we actually see some progress.

But be careful not to rush into doing both OCT and fundus photography together on every single patient until the carriers flesh out their policies. I'd like to see a definitive list of diagnoses allowed and a specific reference to CPT code(s) 92134 and 92133, if both are eventually allowed. ■

Please send your comments to CodingAbstract@gmail.com.

1. Centers for Medicare & Medicaid Services. National Correct Coding Initiative Policy Manual For Medicare Services. Baltimore, MD: CMS; Revised January 1, 2013: I-32; XI-11; I-23.

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Dry Eye: Getting Down to Business

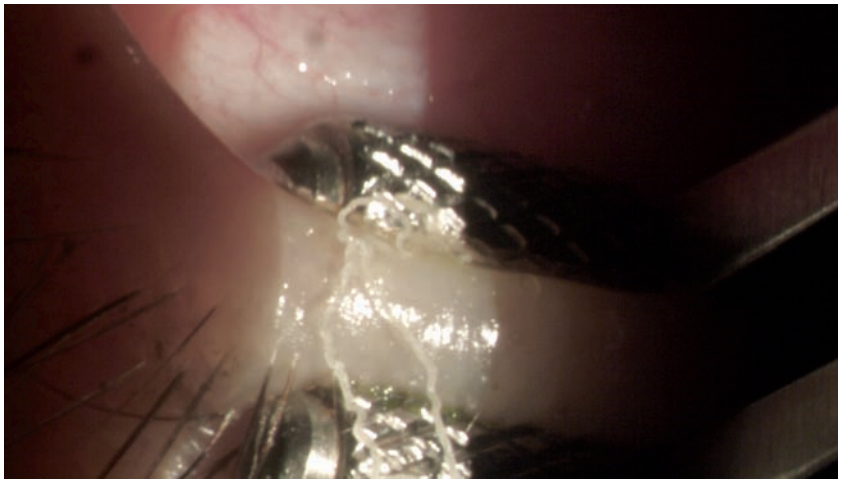
Dry eye treatment can be a productive part of a medical model primary care practice. With the right approach, it can benefit both your patients and your bottom line.

By Jack L. Schaeffer, OD

Not long ago, we had very few effective treatments for dry eye disease—and so, our time and effort in the office often provided little relief for patients and minimal revenue for our practices. In the past several years, new research has given us a much better understanding of this chronic condition, leading to a number of exciting clinical advances in dry eye evaluation and treatment.

The result is an expanded armamentarium of tools to help us more accurately diagnose and successfully treat dry eye. And that means better quality of life for our patients and improved reimbursement for our practices. Of course, we must always operate on the tenet that patient care is the number one priority—we are doctors first, and the business comes second.

With that in mind, we should run our practices efficiently and look at the most cost-effective way to deliver the highest level of care. In this article, we'll look at how you can provide an approach to dry eye evaluation and treatment that yields both clinical and financial gains.



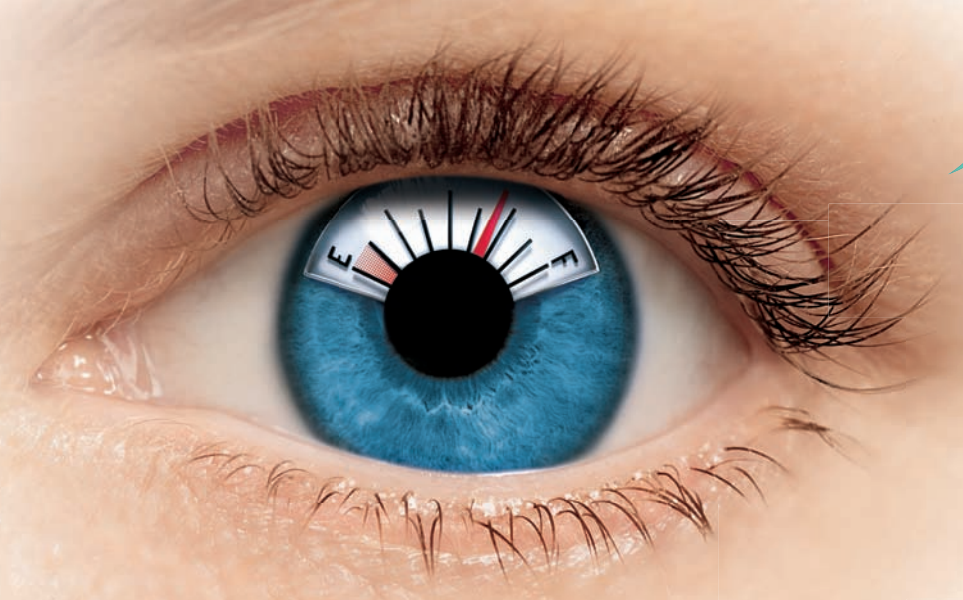
Meibomian fluid produced by using the Maskin meibomoan gland expressor.

Take a Good Look

A business-savvy approach to dry eye must begin with a clinically sound understanding of this complex, multifaceted disease process. Let's start by referring to the definition of dry eye that came from the 2007 International Dry Eye WorkShop:

"Dry eye is a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface."[1]

In light of this definition, we need to get our staff and our patients to view ocular surface



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Indication and Usage

RESTASIS® (cyclosporine ophthalmic emulsion) 0.05% is indicated to increase tear production in patients whose tear production is presumed to be suppressed due to ocular inflammation associated with keratoconjunctivitis sicca. Increased tear production was not seen in patients currently taking topical anti-inflammatory drugs or using punctal plugs.

Important Safety Information

Contraindications

RESTASIS® is contraindicated in patients with known or suspected hypersensitivity to any of the ingredients in the formulation.

Warnings and Precautions

Potential for Eye Injury and Contamination: To avoid the potential for eye injury and contamination, individuals prescribed RESTASIS® should not touch the vial tip to their eye or other surfaces.

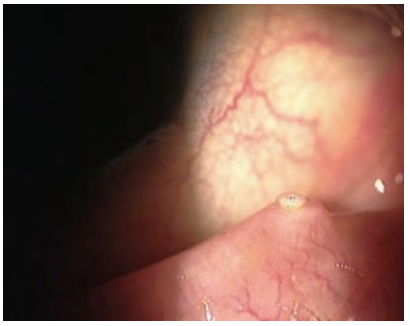
Use With Contact Lenses: RESTASIS® should not be administered while wearing contact lenses. If contact lenses are worn, they should be removed prior to the administration of the emulsion.

Adverse Reactions

In clinical trials, the most common adverse reaction following the use of RESTASIS® was ocular burning (upon instillation)—17%. Other reactions reported in 1% to 5% of patients included conjunctival hyperemia, discharge, epiphora, eye pain, foreign body sensation, pruritus, stinging, and visual disturbance (most often blurring).

Please see Brief Summary of the full Prescribing Information on adjacent page.

ALLERGAN



Surface occlusion punctal plug.

disease (OSD) as a chronic, multifactorial disease—not a secondary issue that's lumped into a routine eye exam.

Many optometric offices suffer because of a failure to differentiate between medical and refractive exams. Both are comprehensive and are part of your daily routine, but should not be considered part of the same examination.

Some doctors make the mistake of prescribing a dry eye treatment as part of the comprehensive exam—but handing the patient a sample or writing a prescription without an evaluation and follow-up is just not good care. A patient with any type of OSD deserves a medical workup.

In our practice, if we uncover a medical issue like dry eye during a routine eye exam, we reschedule the patient for a medical OSD evaluation, which is billed to the medical insurance plan. This approach ensures that you get fairly compensated for your time, and that the patient gets a thorough and complete dry eye evaluation, which is necessary if you're going to make any difference in this disease process.

The OSD evaluation allows you to get a complete history of contributing factors and medical conditions, and to examine the ocular surfaces and adnexa. Some clinicians use tear osmolarity

testing as part of their evaluation. Instruments such as the LipiView Ocular Surface Interferometer (TearScience) aid in a clinical evaluation of the tear film, providing a measure of lipid layer thickness. You may also wish to perform Schirmer's testing, corneal staining and tear film break-up time (which are considered part of the overall evaluation, not as separately billable procedures).

Develop a Long-term Relationship

Once you've determined that the patient has dry eye, take the time to educate them about the nature of the condition and prepare them for what's ahead. Patients often do not understand that dry eye is a chronic and progressive disease.

Many of our patients have a "single-visit" mentality, so one of the most important steps in effective dry eye practice is to educate the patient that dry eye is not a condition that can be solved in one session. Nor will it necessarily be solved with one approach. Instill in your patients a mindset that treating dry eye is a process that you will work through together over a number of visits, trying various options to find a combination that works.

That said, the number of follow-up visits will be different for each patient, depending on what level of care they require. Some dry eye patients need only one or two visits, while others may need up to 10 or 12 in order to control the disease process. Because the majority of vision plans don't reimburse for dry eye evaluation and management (E/M), you'll likely want to bill the patient's major medical insurance for this.

Choose the appropriate E/M code that corresponds with the visit—many providers use 99213 or 99214 for mild to moderate dry eye evaluation.

Let's take a look at the numbers in my state (Alabama) to get an idea of how these medical office visits add up.

Medical Office Visit: OSD Evaluation

99212	$48.00
99213	$64.93
99214	$98.65

Medical Office Visit: Follow-up

99212	$48.00
99213	$64.93

If you anticipate three follow-up visits during the year, here's what the revenue would look like:

Follow-up Revenue per Year

99212(x3)	$144.00
99213(x3)	$194.79

It's easy to see that follow-up is not only key for clinical success, but can also produce significant revenue for your practice.

Reimbursable Dry Eye Evaluation and Treatment

Here's a breakdown of the fees generated for some of the most common dry eye evaluation and treatment procedures you might employ as part of a comprehensive approach. Note: These figures are based on Alabama's reimbursement levels, and may vary by state and carrier.

Procedure	Reimbursement Code	Reimbursement Amount
Anterior segment OCT	92134	$43.00*
Anterior segment photos	92285	$21.45
Lid scrubs	Private Pay	$35.00
LipiFlow expression	Private Pay	$1,500-$1,800 (retail fee)
Medical follow-up (3)	99213/12	$194.79
MG expression	Private Pay	$189.00
OSD evaluation	99203/13	$64.93
Punctal plugs	68761	$178.00
Scleral lenses	V2627/Private Pay**	$2,500-$5,000
Sunglasses	Private Pay	$200.00
TearLab	83861	$20.00*
Topography	92025	$33.16*
Vitamins	Private Pay	$80.00

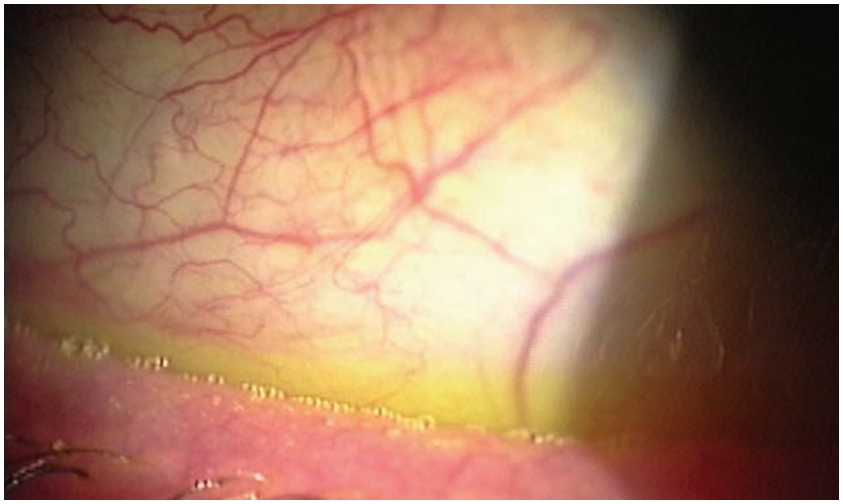
**Only covered in select cases **Covered in select cases and patient is responsible for balance*

Embrace a Combination Approach

For few patients, artificial tears may be enough to relieve their dry eye symptoms, but most require a treatment strategy that involves several different therapies to see real improvement. Our job is to make sure we're providing our patients with the treatment options they need. In a Gallup poll of dry eye sufferers, results indicated that:[2]

- ***72% of patients had physicians recommend artificial tears for their dry eye problem (n=541).***
- ***82% of patients somewhat agreed or strongly agreed that they wish there was something more effective to treat their dry eye (n=751).***
- ***97% of patients reported that their dry eye condition is frustrating (n=751).***

These results suggest that the majority of patients want more from us. Again, this gives us an



Frothing, as seen here, is an early sign of meibomian gland dysfunction.

opportunity to not only improve patient care and satisfaction, but also to enhance our revenue stream. Advances in the last decade have given us a number of effective procedures to add to a comprehensive dry eye treatment strategy—many of which are reimbursable (*see "Reimbursable Dry Eye Evaluation and Treatment," page 31*). Let's take a look at some of the most common approaches:

• ***Meibomian gland expression.*** As it's now been established that meibomian gland dysfunction is probably the single most common cause of dry eye, we know that meibomian gland expression is one of the most valuable treatment options we have.[3] The first step in MGD treatment is to perform an in-office expression procedure. In addition to hot compresses, a number of instruments are available to aid in therapeutic lid expression—several of which we use in our office.

When you're using a procedure that does not have a medical procedure code, remember to have the patient sign an Advance Beneficiary Notice of Noncoverage (ABN) so that the patient agrees to be financially responsible for the treatment if it's not covered. (You can download the forms for free at www.corcoranccg.com.)

One of the procedures we have instituted involves the use of a Maskin expressor (Rhein Medical). We choose to do three in-office expressions over a six-week period, and we have developed a global fee for the procedure. We also use the Maskin meibomian gland intraductal probe (Rhein Medical) to open up each of the meibomian glands in both upper and lower lids. This procedure is also based on private pay fees, as there is no medical code.

The LipiFlow Thermal Pulsation System (TearScience) is also becoming more popular in meibomian gland expression. The device applies heat to the palpebral surfaces of the upper and lower eyelids directly over the meibomian glands to aid in expression. In the absence of prior authorization, it's best to use an ABN form to ensure payment for this procedure as well.

• ***Punctal plugs.*** Once the ocular condition has been treated for a minimum of six to 12 weeks and you feel that the tear film is free of debris and byproducts, you may decide to add a punctal plug to the treatment regimen. (When plugs are inserted too soon, they may actually increase the cytokines, recruiting more T-cells and inflammatory debris contributing more to the dry eye and allergic response.) Punctal plugs diminish tear drainage from the ocular surface and enhance contact time between tears and ocular surface. There are multiple modalities, manufacturers and products, such as collagen, silicone and acrylic polymers as well as intracanalicular and surface punctal occlusion. I prefer surface punctal occlusion for ease of removal.

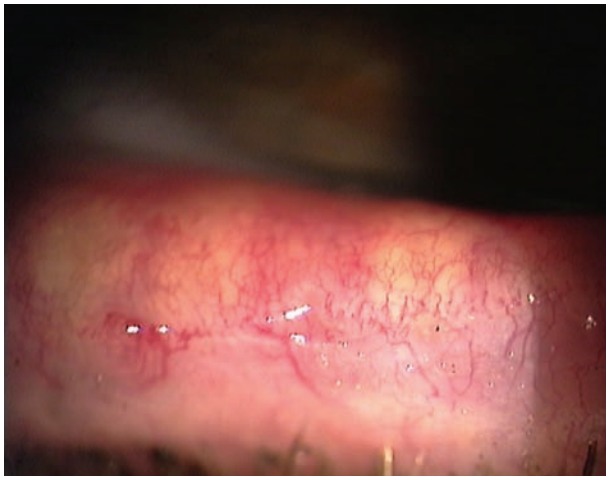
• ***Scleral contact lenses.*** For those patients who have failed with other modalities for dry eye treatment, scleral contact lenses can be an excellent addition. When fit properly, they create a bathing effect on the cornea and alleviate most chronic dry eye signs and symptoms. This is an extremely lucrative profit center when time and expertise are considered in establishing a proper fee structure.

Does Dry Eye Treatment Pay Off?

While many practices don't think of dry eye treatment as a revenue generator, it actually has the potential to produce more revenue than some other expected profit centers in the eye care office. Let's take at the total fees generated to see how it stacks up.[6]

Eyeglass patient	$150-$200
Contact lenses	$125-$200
Eye exam	$60-$225 (depending on payer)
Dry eye	$300-$800 (can be upwards of $1,300-$1,600)

**All figures reflect profit per year.*



Clogged and atrophied meibomian glands.

Make sure you employ a comprehensive contact lens evaluation and follow-up program.

• ***Nutritional therapy.*** Another new profit center is adding nutritional therapy to your product inventory. Omega-3s suppress meibomitis, decrease apoptosis, improve neural signal transduction, stimulate tear production and augment the oil layer.[4] Population studies show omega-3s prevent dry eye.[5]

• ***Sunglasses and spectacles.*** The use of sunglasses and spectacles can be a valuable supplemental treatment for the dry eye patient. When prescribing sunglasses, it is important to create a mini moisture chamber by using a wrap design or specialty inserts.

In addition to the revenue you generate through dry eye testing, follow-up visits and treatment, the patient's satisfaction may earn you more referrals. Financial rewards come when you change the lives of your patients. When we put the patient first, the rest falls into place. ■

Dr. Schaeffer is the president and CEO of Schaeffer Eye Center in Birmingham, Ala., a 13-location practice that offers laser vision correction, comprehensive contact lens services, high fashion eyewear and sunglasses.

1. The definition and classification of dry eye disease: report of the Definition and Classification Subcommittee of the International Dry Eye WorkShop (2007). Ocul Surf. 2007 Apr;5(2):75-92.
2. The Gallup Organization, Inc. The 2008 Gallup Study of Dry Eye Sufferers. Princeton, NJ: Multi-Sponsor Surveys, Inc; 2008.
3. Nichols KK, Foulks GN, Bron AJ, et al. The international workshop on meibomian gland dysfunction: executive summary. Invest Ophthalmol Vis Sci. 2011 Mar 30;52(4):1922-9.
4. Dry Eye Science For Practitioners. How an omega-3 supplement treats dry eye. December 9, 2010.
5. Miljanovic B, Trivedi KA, Dana MR. Relation between dietary n-3 and n-6 fatty acids and clinically diagnosed dry eye syndrome in women. Am J Clin Nutr. 2005 Oct;82(4):887-93.
6. Wright M. Know the five biggest profit drains in your practice. MBA Essentials for Practice Management & Business Growth. February 28, 2013.

Case Report

Feeling the Burn

This patient presented with a large central corneal abrasion associated with pepper spray exposure at a nightclub. **By Len V. Hua, OD, PhD, and Jonathan Hughes, BSc**

Capsaicin—an oily extract from chili pepper plants—is the active ingredient in pepper spray. Commonly used by police officers, security guards and civilians for protection against assailants, the spray's recommended target is the eye. Capsaicin has been added to these self-defending sprays because it has an immediate onset of action—inducing pain, tearing, blurred vision and blepharospasm.[1]

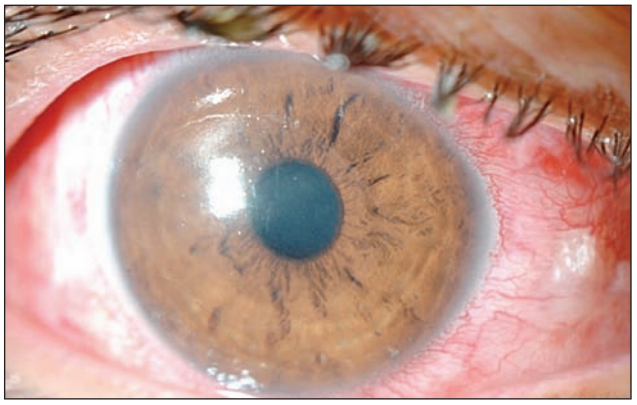
Previous studies have shown that capsaicin can cause mild and transient ocular surface injury, but is relatively harmless to the cornea and conjunctiva after a single exposure.[2] Capsaicin is considered safer than early-generation tear gas, such as chloroacetophenone, which frequently lead to broad keratopathy that required long-term medical management.[3] These advantages have made pepper spray the preferred legal, non-lethal form of self-protection used by both civilians and law enforcement agencies.

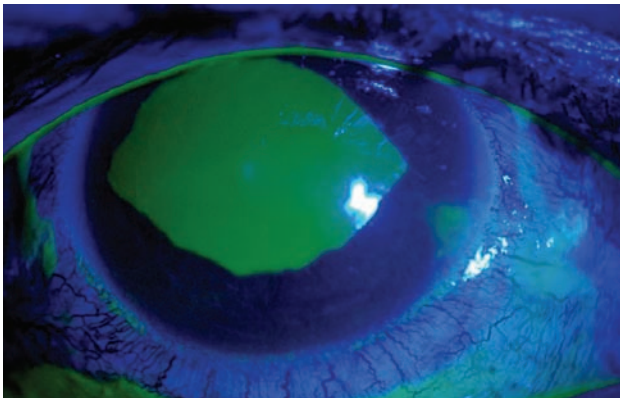
Law enforcement officers must go through drills and simulations with live pepper spray exposures to appreciate its effects and management.[4] Although acute exposure to pepper spray is relatively safe with appropriate and prompt first aid, serious and long-lasting damage to the ocular surface—including the cornea—can arise when medical attention is delayed or omitted.

Here, we present the case report of a patient who got pepper sprayed in his right eye, which resulted in severe conjunctival hyperemia, chemosis and a large central corneal abrasion. We will briefly review the literature on capsaicin and discuss its clinical management and use.

History

A 27-year-old Hispanic male presented with a complaint of





1, 2. Anterior segment photography (left) and fluorescein staining (right) of our patient's right eye at the initial visit.

For the reduction of IOP in patients with POAG or OHTN

When it's important to consider ocular and systemic side effects...

An alternate route to IOP reduction

- Effective at lowering IOP throughout the day and over the long term[1-3]
- Excellent systemic safety profile including no deleterious effects on CV or pulmonary function in clinical studies[1]
- Established ocular side effects profile: In clinical trials comparing RESCULA and timolol,* both were generally well tolerated regarding ocular adverse events, with similar incidence of hyperemia and similar changes to eyelash length and density[1,4,5]
  - The only events seen significantly more often with RESCULA than with timolol were burning and stinging and burning/stinging upon instillation; these events were generally mild and transient[2,4]
- No labeled drug-drug interactions[1,4]

Indication

RESCULA (unoprostone isopropyl ophthalmic solution) 0.15% is indicated for the lowering of intraocular pressure in patients with open-angle glaucoma or ocular hypertension.

Important Safety Information

RESCULA is contraindicated in patients with hypersensitivity to unoprostone isopropyl or any other ingredient in this product.

RESCULA has been reported to increase pigmentation of the iris, periorbital tissues, and eyelashes. Patients should be advised about the potential for increased brown iris pigmentation which is likely to be permanent.

RESCULA should be used with caution in patients with active intraocular inflammation (e.g., uveitis) because the inflammation may be exacerbated.

Macular edema, including cystoid macular edema, has been reported. RESCULA should be used with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema.

*In pooled safety analyses of pivotal trials comparing RESCULA with timolol maleate 0.5%.[4]

Please see Brief Summary on reverse and full Prescribing Information, available from your Sucampo representative.

Rescula®
(Unoprostone isopropyl
ophthalmic solution) 0.15%

Brief Summary of Prescribing Information for RESCULA.

INDICATIONS AND USAGE
Rescula (unoprostone isopropyl ophthalmic solution) 0.15% is indicated for the lowering of intraocular pressure in patients with open-angle glaucoma or ocular hypertension.

DOSAGE AND ADMINISTRATION
The recommended dosage is one drop in the affected eye(s) twice daily.

Rescula may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure. If two drugs are used, they should be administered at least five (5) minutes apart.

CONTRAINDICATIONS
Rescula is contraindicated in patients with hypersensitivity to unoprostone isopropyl or any other ingredient in this product.

WARNINGS AND PRECAUTIONS
Iris Pigmentation
Unoprostone isopropyl ophthalmic solution may gradually increase the pigmentation of the iris. The pigmentation change is believed to be due to increased melanin content in the melanocytes rather than to an increase in the number of melanocytes. The long term effects of increased pigmentation are not known. Iris color changes seen with administration of unoprostone isopropyl ophthalmic solution may not be noticeable for several months to years. Typically, the brown pigmentation around the pupil spreads concentrically towards the periphery of the iris and the entire iris or parts of the iris become more brownish. Neither nevi nor freckles of the iris appear to be affected by treatment. Treatment with Rescula solution can be continued in patients who develop noticeably increased iris pigmentation. Patients who receive treatment with Rescula should be informed of the possibility of increased pigmentation.

Lid Pigmentation
Unoprostone isopropyl has been reported to cause pigment changes (darkening) to periorbital pigmented tissues and eyelashes. The pigmentation is expected to increase as long as unoprostone isopropyl is administered, but has been reported to be reversible upon discontinuation of unoprostone isopropyl ophthalmic solution in most patients.

Intraocular Inflammation
Rescula should be used with caution in patients with active intraocular inflammation (e.g., uveitis) because the inflammation may be exacerbated.

Macular Edema
Macular edema, including cystoid macular edema, has been reported. Rescula should be used with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema.

Contamination of Tip and Solution
To minimize contaminating the dropper tip and solution, care should be taken not to touch the eyelids or surrounding areas with the dropper tip of the bottle. Keep bottle tightly closed when not in use. There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products.

Use with Contact Lenses
Rescula contains benzalkonium chloride, which may be absorbed by soft contact lenses. Contact lenses should be removed prior to application of solution and may be reinserted 15 minutes following its administration.

ADVERSE REACTIONS
Clinical Studies Experience
Because clinical studies are conducted under widely varying conditions, adverse reaction rates observed in the clinical studies of a drug cannot be directly compared to rates in the clinical studies of another drug and may not reflect the rates observed in practice.

In clinical studies, the most common ocular adverse reactions with use of Rescula were burning/stinging, burning/stinging upon drug instillation, dry eyes, itching, increased length of eyelashes, and injection. These were reported in approximately 10–25% of patients. Approximately 10–14% of patients were observed to have an increase in the length of eyelashes (≥ 1 mm) at 12 months, while 7% of patients were observed to have a decrease in the length of eyelashes.

Ocular adverse reactions occurring in approximately 5–10% of patients were abnormal vision, eyelid disorder, foreign body sensation, and lacrimation disorder.

Ocular adverse reactions occurring in approximately 1–5% of patients were blepharitis, cataract, conjunctivitis, corneal lesion, discharge from the eye, eye hemorrhage, eye pain, keratitis, irritation, photophobia, and vitreous disorder.

The most frequently reported nonocular adverse reaction associated with the use of Rescula in the clinical trials was flu-like syndrome that was observed in approximately 6% of patients. Nonocular adverse reactions reported in the 1–5% of patients were accidental injury, allergic reaction, back pain, bronchitis, increased cough, diabetes mellitus, dizziness, headache, hypertension, insomnia, pharyngitis, pain, rhinitis, and sinusitis.

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

Voluntary reports of adverse reactions occurring with the use of Rescula include corneal erosion.

There have been rare spontaneous reports with a different formulation of unoprostone isopropyl (0.12%) of chemosis, dry mouth, nausea, vomiting and palpitations.

USE IN SPECIFIC POPULATIONS
Pregnancy Category C - There are no adequate and well-controlled studies in pregnant women. Because animal studies are not always predictive of human response, RESCULA should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Pediatric Use - the safety and efficacy of RESCULA in pediatric patients have not been established.

It is not known whether RESCULA is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when RESCULA is administered to a nursing woman.

No overall differences in safety or effectiveness of RESCULA have been observed between elderly and other adult populations.

CLINICAL PHARMACOLOGY
Mechanism of Action
Rescula is believed to reduce elevated intraocular pressure (IOP) by increasing the outflow of aqueous humor through the trabecular meshwork. Unoprostone isopropyl (UI) may have a local effect on BK (Big Potassium) channels and CIC-2 chloride channels, but the exact mechanism is unknown at this time.

STORAGE AND HANDLING
Store between 2°–25°C (36°–77°F).

For more detailed information please read the Prescribing Information.

Marketed by:

Sucampo Pharma Americas, LLC
Bethesda, MD 20814

Revised 01/2013

References: **1.** RESCULA [package insert]. Bethesda, MD: Sucampo Pharmaceuticals, Inc; 2012. **2.** Data on file. CSR C97-UIOS-004. Sucampo Pharmaceuticals, Inc. **3.** Data on file. CSR C97-UIOS-005. Sucampo Pharmaceuticals, Inc. **4.** Data on file. Integrated summary of clinical safety. Sucampo Pharmaceuticals, Inc. **5.** McCarey BE, Kapik BM, Kane FE; Unoprostone Monotherapy Study Group. Low incidence of iris pigmentation and eyelash changes in 2 randomized clinical trials with unoprostone isopropyl 0.15%. *Ophthalmology.* 2004;111(8):1480-1488.

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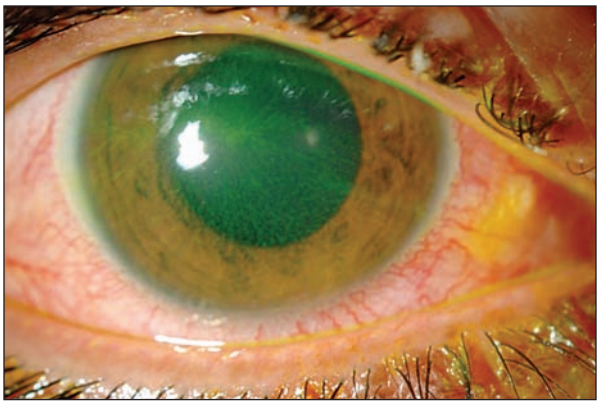
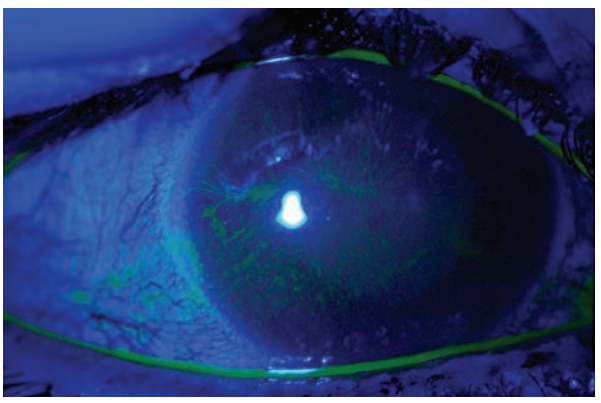
general ocular pain, pain on eye movements, severe redness, tearing and blurry vision in his right eye. He explained that a security guard at a nightclub had subdued him with pepper spray on a Saturday night four days prior. The exposure was mainly in his right eye and minimal in his left eye. Immediately after the incident, he washed his eyes with soda.

On Sunday, he woke up with severe pain in his right eye, but decided to wait, hoping it would improve. He had a similar experience three years ago with minimal symptoms. He was healthy and not taking any medications.





3, 4. Anterior segment photography (top) and fluorescein staining (bottom) of our patient's right eye at the two-day follow-up visit.

Diagnostic Data

The patient's right eye had moderate lid swelling, conjunctival hyperemia and a large, central corneal abrasion, which was alarming at initial presentation. We instilled a drop of topical anesthetic to relieve the blepharospasm. Before measuring visual acuity, we performed a thorough saline lavage and confirmed (with litmus strips) that his ocular pH was neutral. His best-uncorrected entering visual acuity was 20/60-1, pinhole 20/50+2 OD in the affected right eye and 20/25-1 OS. Confrontational fields were normal and there was no afferent defect. Refraction was deferred.

Biomicroscopy of the anterior segment showed 360° grade 3 conjunctival injection (*figure 1*) and, upon fluorescein staining, a large (1DD) central corneal abrasion OD with significant swelling, but no Seidel's sign (*figure 2*), symblephara or foreign debris. The lids were everted. Anterior segment examination of the left eye showed mild conjunctival injection without corneal defect.

Intraocular pressure by applanation measured 18mm Hg OU. Direct funduscopy showed no gross defects.

Management

We instilled one drop of atropine sulfate 1% for in-office cycloplegia as well as TobraDex (tobramycin/dexamethasone, Alcon) for antibiotic/inflammatory coverage OU.

We prescribed a bandage contact lens (AirOptix Night & Day, Ciba Vision), along with TobraDex QID OD, and scheduled the patient to return to the clinic in two days. We educated the patient about bandage contact lenses, medical treatment and the importance of follow-up visits. We also advised him to take over-the-counter acetaminophen or ibuprofen as needed, along with cold compresses and artificial tears. The left eye required only passive lubrication therapy.

Follow-up Visit 1

The patient returned two days later for a follow-up. He reported feeling better with less pain. After removal of the bandage contact lens, uncorrected visual acuity was 20/70, pinhole 20/60- OD and 20/20- OS.

Biomicroscopy of the anterior segment showed 360° grade 2 conjunctival injection (*figure 3*) and a resolving corneal abrasion OD via fluorescein staining (*figure 4*). Anterior segment examination of the left eye was normal. IOP was 16mm Hg OD and 14mm Hg OS.

Dilated fundus examination showed normal ocular health with cup-to-disc ratios of 0.15H x 0.15V OU. We instructed the patient to continue with TobraDex QID OD and return in five days, or sooner if necessary. We did not replace the bandage lens.

Follow-up Visit 2

One week later, the patient's visual acuities had improved significantly and measured 20/25- OD and 20/20- OS. Biomicroscopy of the anterior segment OD showed trace conjunctival injection (*figure 5*) and an intact cornea via fluorescein staining (*figure 6*). Anterior

segment examination of the left eye was normal. IOP by applanation was 16mm Hg OD and 15mm Hg OS.

We informed the patient that the surface injuries to both the conjunctiva and cornea were now 95% resolved. We instructed him to taper the TobraDex to BID for two days OD, then QD for two days and then discontinue.

We explained the possibility of recurrent corneal erosion in the future and advised him to continue using the topical artificial tears to prevent it. We also educated him on first aid for chemical exposure (emergency eye wash techniques) in case of future exposures, and asked him to return in four months, or earlier if needed.

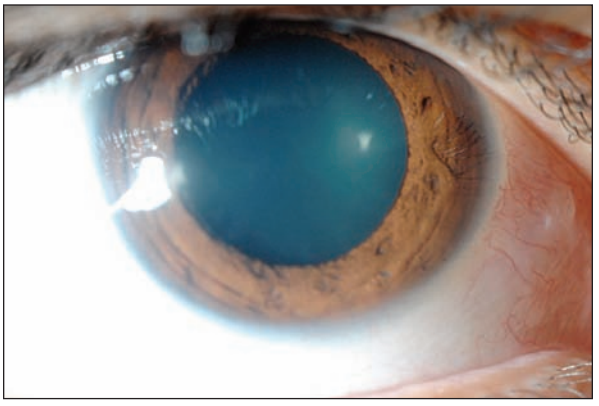
Discussion

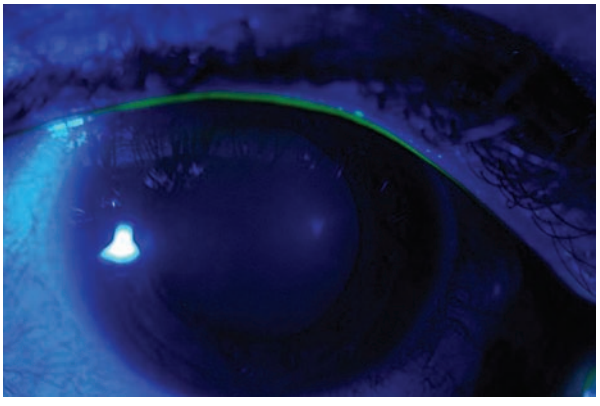
Pepper spray products are sold in various formulations and packages containing a large variety of ingredients and different concentrations of capsaicin. For example, one version used in a police drill study (Cap-Stun, Zarc) was a mixture containing 5.5% oleoresin capsicum, 30.5% isobutane as a propellant and 64% isopropyl alcohol as a carrier.[2] In addition, caustic chemicals—such as alcohols and organic solvents—are standard components of both the spray and propellant, and each of these components has the potential to induce serious conjunctival and corneal injury.

Central corneal abrasion secondary to pepper spray insult is not common, but can occur secondary to the chemical's effects or rubbing of the eyes following the exposure. Ocular injury associated with pepper spray is common. Fortunately, most cases of capsaicin exposure cause only minor and ephemeral ocular injury with prompt irrigation and medical care. However, serious and long-lasting ocular damage can result with delayed management.

Our patient's large corneal epithelial damage could very well have been caused by violent rubbing and/or isopropyl alcohol, and other organic solvents that were part of the pepper spray mixture, rather than by capsaicin.

Previous studies on the acute effects of capsaicin on corneal nerve in animals suggested that it activates the vanilloid receptor (VR1, an ion channel) in polymodal nociceptive neurons, leading to massive neuronal calcium entry and a transient excitation of the nerves producing intense pain followed by neuronal damage and desensitization of most fibers to all subsequent stimuli.[5-8] In other words, capsaicin usually causes acute neurogenic inflammation, pain, erythema, tearing, blepharospasm and blurred vision.





5, 6. Anterior segment photography (top) and fluorescein staining (bottom) of our patient's right eye at the one-week follow-up visit.

Most recently, researchers in Switzerland reported a rare case of conjunctival proliferation in a toddler after a mild exposure to pepper spray.[9] Emergency medical doctors reported the case of a 21-year-old military police officer candidate who developed a corneal ulcer after pepper spray exposure following military training.[10] Serious systemic effects due to pepper spray exposure have been also reported, including bradycardia, hypotension and even death.[11]

Pepper spray has been approved for use as self-defense weapon since the 1970s.[2] There have been various anecdotal treatments published but little research into their efficacy—including vegetable oil, baking soda paste, vinegar, milk, alcohol, lidocaine gel, antacids and corticosteroids.

A 2008 trial studied the amount of pain relief over time provided by antacid Maalox (magnesium hydroxide-aluminum hydroxide, Novartis), whole milk, 2% lidocaine gel and baby shampoo, as compared with tap water, in adult volunteers who were exposed

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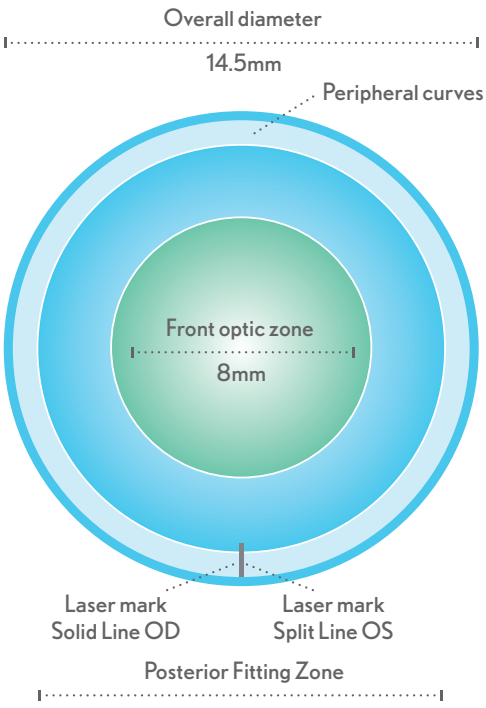

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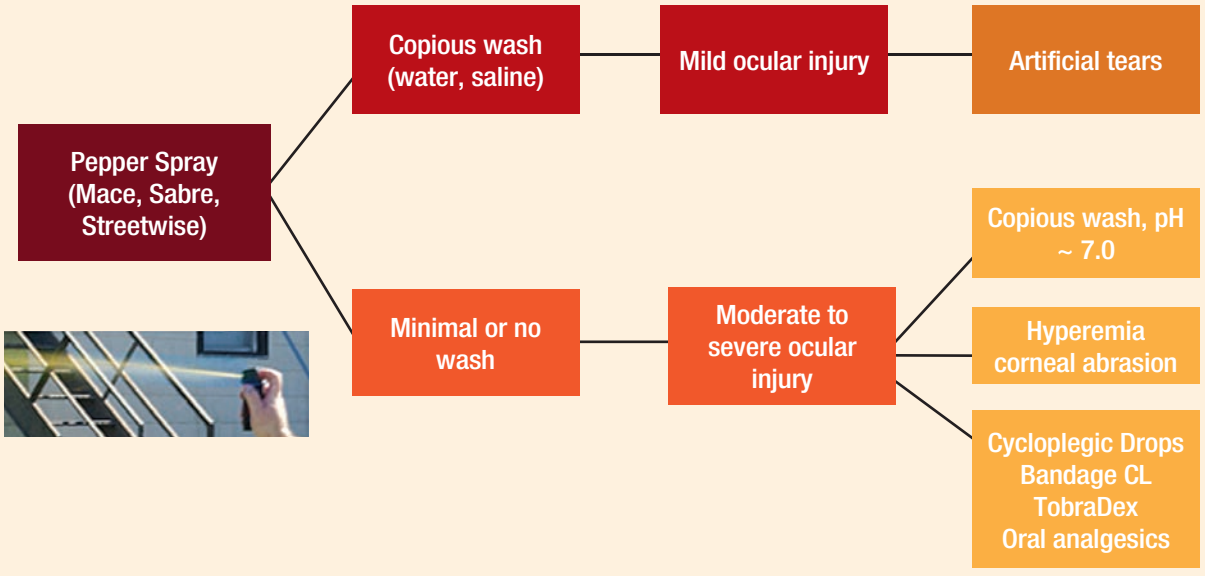
Clinical Management of Ocular Injury Secondary to Pepper Spray Exposure



to Cap-Stun.[13] Results showed there was no significant difference between treatment groups, and time was the most important factor in the resolution of pain from pepper spray exposure. The authors concluded that a copious water wash remains the preferred method of decontamination after exposure to pepper spray, and oral analgesics may be used for pain relief as needed.

Interestingly, low-concentration topical capsaicin has been used effectively as treatment of post-herpetic neuralgia (PHN) for decades and, more recently, Qutenza (capsaicin, NeurogesX Inc.), a higher concentration (8%) capsaicin patch, has been approved for PHN.[14,15]

The patch is applied to the affected area with a topical anesthetic to reduce application site pain. A single, one-hour application can provide three months of relief from PHN or pain after shingles.[16]

Although acute exposure to pepper spray is relatively safe with appropriate and prompt first aid, serious and long-lasting damage to the ocular surface—including the cornea—can arise without prompt irrigation and medical attention. Exposure to pepper spray is similar to other chemical exposure; thus, ocular injury must be managed initially by copious irrigation with water or saline and followed by medical therapy. ■

Dr. Hua is assistant professor of optometry at the Pacific University College of Optometry in Forest Grove, Ore. Mr. Hughes is a third-year optometric intern at the same university.

1. Zollman TM, Bragg RM, Harrison DA. Clinical effects of oleoresin capsicum (pepper spray) on the human cornea and conjunctiva. Ophthalmology. 2000 Dec;107(12):2186-9.
2. Vesaluoma M, Muller L, Gallar J, et al. Effects of oleoresin capsicum pepper spray on human corneal morphology and sensitivity. Invest Ophthalmol Vis Sci. 2000 Jul;41(8):2138-47.
3. Hoffmann DH. Eye burns caused by tear gas. Br J Ophthalmol. 1967 Apr;51(4):265-8.
4. Lee RJ, Yolton TL, Yolton DP, et al. Personal defense sprays: effects and management of exposure. J Am Optom Assoc. 1996 Sep;67(9):548-60.
5. Caterina MJ, Schumacher MA, Tominaga M, et al. The capsaicin receptor: a heat-activated ion channel in the pain pathway. Nature. 1997 Oct 23;389(6653):816-24.
6. Tominaga M, Caterina MJ, Malmberg AB, et al. The cloned capsaicin receptor integrates multiple pain-producing stimuli. Neuron. 1998 Sep;21(3):531-43.
7. Belmonte C, Gallar J, Pozo MA, Rebollo I. Excitation by irritant chemical substances of sensory afferent units in the cat's cornea. J Physiol. 1991 Jun;437:709-25.
8. Chen X, Belmonte C, Rang HP. Capsaicin and carbon dioxide act by distinct mechanisms on sensory nerve terminals in the cat cornea. Pain. 1997 Mar;70(1):23-9.
9. Gerber S, Frueh BE, Tappeiner C. Conjunctival proliferation after a mild pepper spray injury in a young child. Cornea. 2011 Sep;30(9):1042-4.
10. Shimada M, Young C, Tanen DA. Corneal ulcer associated with pepper spray exposure during military training. J Emerg Med. 2012 Aug;43(2):e149.
11. Steffee CH, Lantz PE, Flannagan LM, et al. Oleoresin capsicum (pepper) spray and "in-custody-deaths." Am J Forensic Med Pathol. 1995 Sep;16(3):185-92.
12. Watson WA, Stremel KR, Westdorp EJ. Oleoresin capsicum (Cap-Stun) toxicity from aerosol exposure. Ann Pharmacother. 1996 Jul-Aug;30(7-8):733-5.
13. Barry JD, Hennessy R, McManus JG Jr. A randomized controlled trial comparing treatment regimens for acute pain for topical oleoresin capsaicin (pepper spray) exposure in adult volunteers. Prehosp Emerg Care. 2008 Oct-Dec;12(4):432-7.
14. Watson CP, Tyler KL, Bickers DR, et al. A randomized vehicle-controlled trial of topical capsaicin in the treatment of postherpetic neuralgia. Clin Ther. 1993 May-Jun;15(3):510-26.
15. Irving GA, Backonja MM, Dunteman E, et al. A multicenter, randomized, double-blind, controlled study of NGX-4010, a high-concentration capsaicin patch, for the treatment of postherpetic neuralgia. Pain Med. 2011 Jan;12(1):99-109.
16. Jones VM, Moore KA, Peterson DM. Capsaicin 8% topical patch (Qutenza)--a review of the evidence. J Pain Palliat Care Pharmacother. 2011;25(1):32-41.

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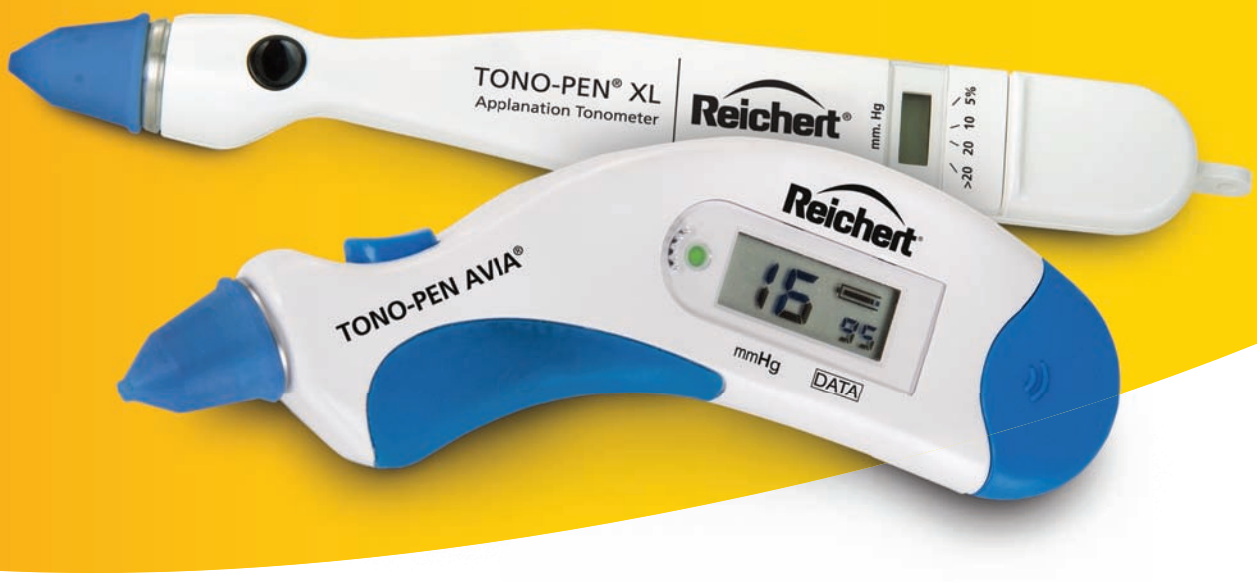

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The Multifocal Contact Lens Market: It's Yours to Lose

The patients are already in your practice. Many are happy wearing lenses. Don't give them a reason to discontinue. **By Robert Murphy, Contributing Editor**

When a patient in his or her 40s first reports trouble seeing at near, what is your next step? Someone wearing spectacles might reasonably wish to stay with them. Or maybe not—you might take this occasion to introduce or reiterate the option of contact lens correction, as the patient will need new lenses (either progressives or stand-alone reading glasses) anyway. One piece of advice from multiple sources: Be proactive in discussing multifocal contact lenses, which today are considered better than ever, with unprecedented high success rates.

Naturally, a long-time contact lens wearer might prefer to stay in contact lenses. These days, there are several effective multifocal contact lens designs—including soft, gas permeable and hybrid lenses—that satisfy wide-ranging yet individualized visual demands. The mantra seems to be, multifocal contact lenses will fulfill most of a patient's visual demands most of the time. Efforts to maximize lighting, a critical factor especially with near vision, as well as the occasional use of a pocket magnifier may improve success.

Practitioners today must grapple with some pertinent and potentially profitable facts. For one, the presbyopic population continues to expand—with the number of presbyopes in the US projected rise to 116 million (36%) in 2016 from 108 million (35%) in 2011.[1] Even as the population grows, however, we also know that contact lens use diminishes sharply with age.

The good news: Contact lens wearers are largely committed to remaining in contact lenses. This is the core of your patient population for multifocal contact lenses. Some 91% of contact lens wearers ages 35 to 55 have their hearts set on continuing with contact lenses.[2]

Here we find an unmet need among early presbyopes. In a 2009 survey of 500 presbyopic patients, only 8% of contact lens wearers reported being told about multifocal contact lenses when they first complained about near vision problems.[3] The same study found that one out of three patients said they would likely switch to another practitioner if their current doctor did not inform them about multifocal contact lenses.

Fact is, many presbyopes express an interest in trying multifocal contact lenses. In a 2007 survey conducted by the Contact Lens Council, 40% of patients reported that they were unaware that multifocal contact lenses could correct their presbyopia.[4]

The key is to start the patient in multifocal contact lenses early in presbyopia.[5] What are the advantages? The patient adapts more smoothly when moving into a low-add lens. At this stage, the patient is less likely to get frustrated and perhaps drop out. Success rates are high when fitting presbyopes at an early stage—and those satisfied

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patients are likely to boost referrals to your practice.

Be Proactive

When dealing with a patient who reports or exhibits symptoms of early presbyopia, the first step is to communicate all available options to correct the problem.

A patient accustomed to glasses may lean toward progressive addition lenses or some other spectacle correction, such as reading glasses. But don't assume that is a given—don't take it for granted that a patient is unwilling to try contact lenses, even those well into their 40s. Looking at the long term, contact lenses are not solely for the young; depending on their tear film integrity and other factors, some patients wear contact lenses happily well into their 70s.

Explaining all options inevitably includes the pros and cons of monovision. Though recognizing that monovision works in the short term, specialty contact lens practitioners tend to cast aspersions on this option, seeing it as an inferior (though less expensive) option and envisioning worsened binocularity down the road.

"Monovision is dead," proclaims Jack Schaeffer, OD, of Schaeffer Eyecare Center in Birmingham, Ala. "Monovision is a cop-out. It is an alternative avenue for a doctor to charge a lower fee, spend less time and give the patient less care." At some point, monovision is going to reduce stereopsis, and patients will also experience reduced night vision. "You're putting the patient and others in danger when driving at night because of the reduced vision," Dr. Schaeffer says.

"Doctors should charge a higher fee for multifocal contact lenses to compensate for their time," says Dr. Schaeffer, "because it takes additional chair time and expertise to have multifocal success."

As with any presbyopic correction, monovision delivers a mix of advantages and disadvantages. "It's not only harder to fit them in a multifocal after they've used monovision," says Thomas Quinn, OD, a private practitioner from Athens, Ohio. "We believe that there's also a neurological adaptation required. It's like asking a runner to swim and a swimmer to run. It's hard to switch. Likewise, there's some brain adaptation when you switch from monovision to multifocals."

A prerequisite to success is a patient who understands how multifocal contact lenses work and what it takes to achieve an optimal fit. This is where an exhaustive face-to-face conversation with the patient comes in. Few other patient encounters in eye care demand such an extensive degree of practitioner-patient communication. Here you convey the pros and cons of all available corrective options, carefully interview the patient about occupational and leisure-activity visual demands, and develop an early sense of which multifocal contact lens design might best satisfy the patient's specific individual needs.

Be careful here. Emphasize the benefits of your first lens of choice without suggesting that it will solve all their visual needs at all times. There is no magic bullet. All presbyopic corrections come with trade-offs. Discuss the limitations of multifocal contact lenses and the other presbyopia correction options. Set realistic expectations for the patient. A patient who knows what to expect and is willing to accept the compromises is less likely to drop out of contact lens wear or blame your practice for promising more than you delivered.

Be Creative

Many contact lens practitioners recommend using the manufacturer's evidence-based fitting guidelines, at least as a way to choose an initial lens design. Some clinicians, especially those with extensive experience fitting all types of contact lenses, may choose to disregard the guidelines altogether and place their faith in their own empirically-based intuition, which is fine, too. Whatever your level of expertise, though, it's hard to question the value of evidence-based fitting guidelines that incorporate clinical research rigorously conducted by experienced specialty contact lens practitioners.

One of those investigators is New York optometrist Susan Resnick. She favors the use of fitting guidelines, perhaps in part because she has worked hard contributing to these advisory documents.

"One of the mistakes—probably less prevalent among the newer clinicians than among older ones like myself—is that sometimes we rely on past experience to approach new products," she says. "And that can be a problem. Because some of us have ingrained habits that have worked in the past, we feel like we have experience in making the sort of adjustments and knowing where to start. You start tweaking too soon, you start changing the recipe before you've tasted it."

Dr. Resnick advises colleagues to follow the guidelines for your first trial pair of lenses, and to follow the manufacturer's nomogram and flowchart for troubleshooting. Once you select an initial lens, and carefully evaluate it, you will be on the path to a more efficient and successful fitting outcome.

In the meantime, have the patient try their new lenses—first within and then outside the office—for

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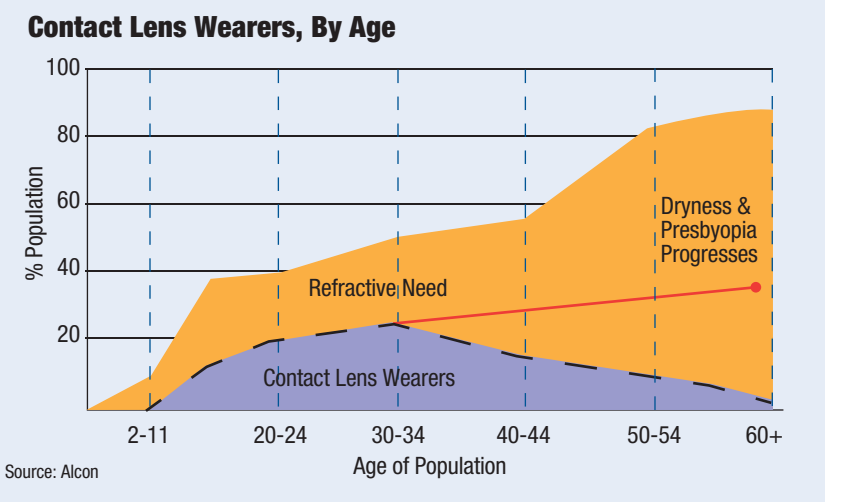
10 minutes or so as the lenses settle. Listen closely to the patient's account of their initial experience with the lenses. Fitting multifocal contact lenses often calls for clinical creativity based largely on the patient's subjective experience. It's one of the instances in which the patient's subjective impressions play a paramount role in achieving clinical success.

After the initial fitting, you should have the patient come back in a week or two, or else call the patient to get a report of his impressions. You don't need to speak face-to-face to find out how the patient is doing. If they're having trouble with some aspect of their vision, invite the patient to visit so you might rectify the matter.

Be Persistent

Practitioners recommend limiting the number of lens choices of varying powers that you try to two or three. That is, don't abandon the modality if your initial lens design and prescription leave the patient with subpar vision in some circumstances. Maybe a different lens or adjustment of powers will provide just what the patient needs. Crucial to clinical success is the effort to fit patients according their occupational and leisure-time activities. A patient who is an avid reader has different visual needs from, say, an avid golfer.

Practitioners commonly agree to provide follow-up care on a per-visit cost basis. A time frame of 60 to 90 days for anticipated follow-up visits—which may or may not prove to be necessary—sets a general limit for follow-up visits. At some point, you or the patient may decide that another option is best, but do allow for some trial-and-error before making that decision.



Contact lens wear declines as refractive need begins to dramatically increase. The red line shows a projection of the potential contact lens wearing population if drop-outs could be eliminated.

Be Realistic

Kenny Rogers famously put some valuable advice to song: "Know when to walk away." Maybe the optometrist is something of a clinical version of "The Gambler" when it comes to tricky contact lens fits. Given today's lens designs, the odds are on your side. The question boils down to, how exactly do you know the time has come to discontinue fitting? "There are some patients who want to try every single power combination that you have," says Jason Miller, OD, of Powell, Ohio. "And certainly that can be very time-consuming. Number one, I try to minimize the number of follow-ups. If you understand the designs of the lenses, you can usually make a couple changes and correct someone's vision early on. But there are times when some patients are a very challenging fit, either because of their expectations or visual needs."

That stands to reason. But how do you address it? "Narrow it down to two lens choices for the patient, one that may give a little more distance and one that maybe gives a little more near," Dr. Miller says, echoing a popular refrain in optometric offices: "Ask them, 'Which do you like better, lens one or lens two? Which one gives you better vision?' Let them decide. That will help minimize your follow up."

Be Fairly Compensated

No one disputes the reality that fitting multifocal contact lenses—especially with mid- to late-stage presbyopia—is a time-consuming task requiring extensive consultation and chair time. When setting fees, don't undervalue the worth of your expertise, not to mention your time.

Many practitioners favor a sort of modified global fee approach. That is, they charge for a comprehensive eye exam, a diagnostic contact lens fitting and materials. The degree of follow up care hinges on the patient's prognosis at the initial visit. In the case of a failed fit, many clinicians limit refunds solely for returnable lenses.

"We use a modified global fee structure," says S. Barry Eiden, OD, who practices in Deerfield and

Park Ridge, Ill. "We will perform a contact lens diagnostic evaluation and initial fitting to determine the lens design that we feel will be most appropriate. If the patient is an established and successful contact lens wearer, we may dispense diagnostic lenses and order their annual supply at that time in order to keep costs under control."

But, many cases require aftercare visits, he adds, "which we charge in advance for a specified period of time. Then again, some cases that require aftercare may be more straightforward and we decide to perform perhaps only one or two aftercare visits, which we charge on a per-visit basis."

Satisfy an Underserved Population

There exists a large unmet need for contact lens patients, including those with incipient presbyopia. It's an expensive proposition for the patient, not to mention one of the more time-consuming services you can deliver. The best time to fit a presbyope in contact lenses is at the early stages of visual symptoms.

The idea here is to start the patient in multifocal contact lenses when they are easiest to fit, owing to a low add. As the patient adapts to and embraces multifocal contact lenses over time, you not only have a satisfied patient but also one who is likely to tell family members and friends about your skills and corrective options. ■

1. The 2011 Comprehensive Report on the Global Presbyopia Correcting Surgery Market. St. Louis, MO: Market Scope.
2. Reindel WT, Edmunds FR. A clinical assessment of presbyopic soft contact lens designs: comparing the impact of SofLens multifocal contact lenses and Acuvue bifocal contact lenses on successfully adapted monovision patients. Rev Optom. 2003 Apr 15;140(4).
3. Studebaker JB. Soft multifocals: practice growth opportunity. Contact Lens Spectrum. June 2009.
4. Eye on innovation [survey]. Landover, MD: Contact Lens Council; 2007.
5. Alcon Laboratories. Best practices for multifocal contact lens use in your practice [webinar]. August 8, 2012.

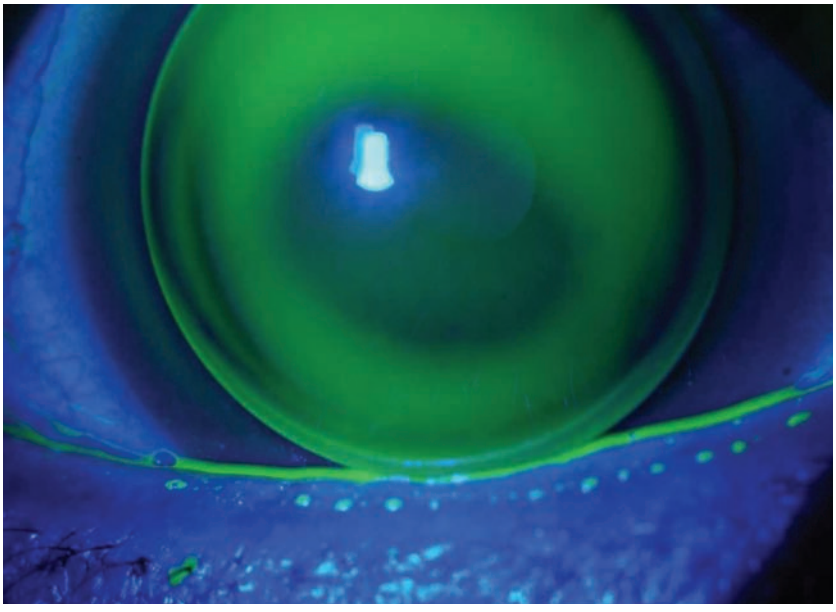
7 Steps for Success When Coding Contact Lens Fits

Don't neglect to make the most of your contact lens services for your patients—and your practice. **By Jason R. Miller, OD, MBA**

In the face of health care reform, contact lenses are vitally important to the optometric business model. Advanced contact lens materials, designs and solution systems have improved our ability to provide a comfortable contact lens wearing experience—but being able to properly code and be reimbursed for your time, expertise and materials is critical to success.

You may be missing a key opportunity if you neglect to promote your treatment protocol with contact lens wearers. Developing a strong foundation will, in turn, create a strong business revenue center.

Here are seven ways to make sure you do it right:



Fitting a patient with keratoconus can be tricky. (This lens will need to be altered to vault the cone area better.) Coding and billing for such a lens fit can be even trickier.

1. Orchestrate the Encounter

Analyze your interaction with your patients from their perspective and break it down:

• ***Who is going to start the conversation about contact lenses?*** Is it going to be the doctor, a staff member or the patient who initiates this process? My recommendation is that the doctor or staff members should lead a proactive discussion about the contact lens options. Let the patient know that she or he is an excellent candidate for contact lens wear. If it is your patient who initiates the discussion every time, you're likely missing some opportunities.

• ***Who is going to present the***

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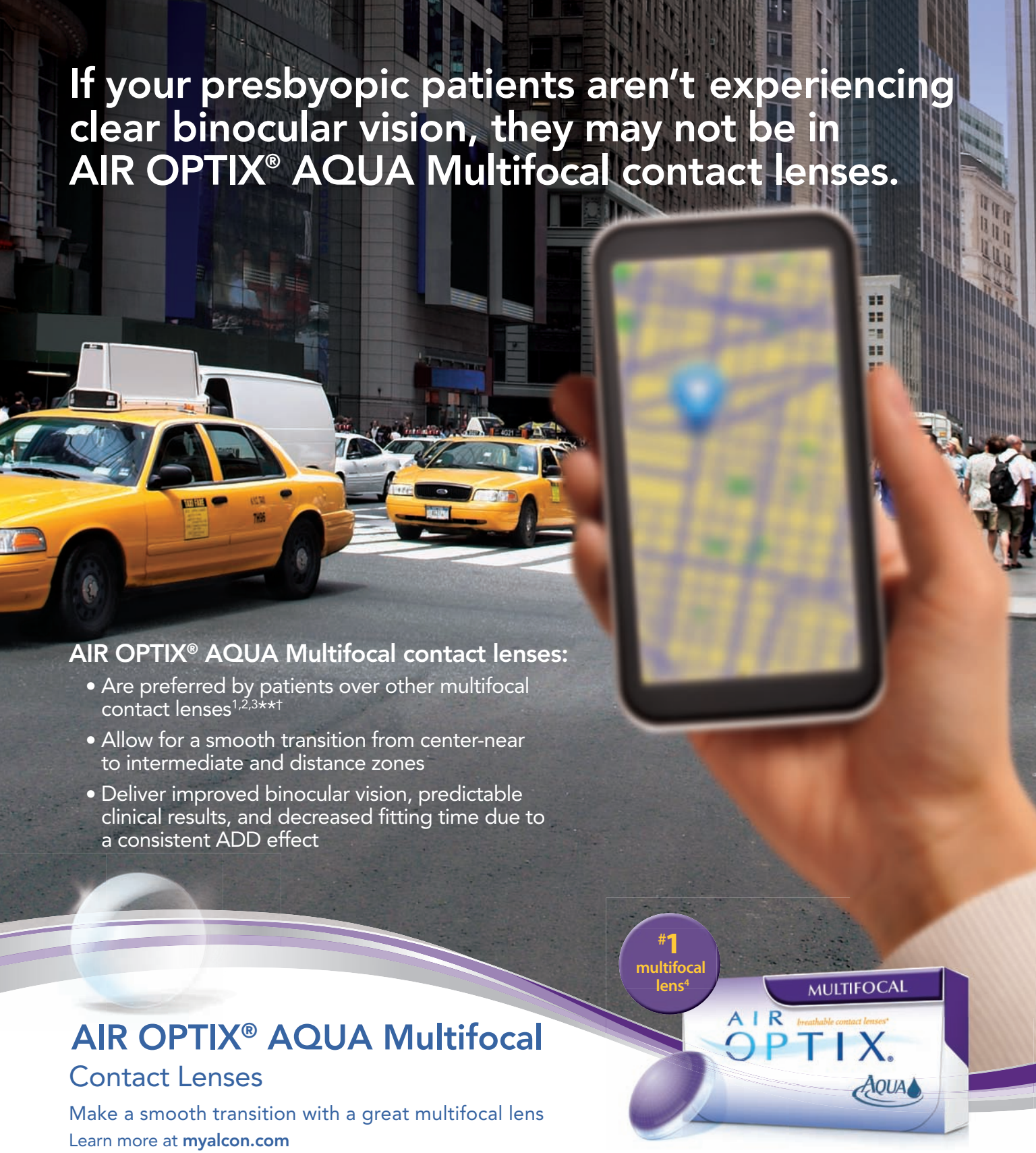

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References: 1. In a randomized, subject-masked clinical study at 20 sites with 252 patients; significance demonstrated at the 0.05 level; Alcon data on file, 2009. **2.** Rappon J. Center-near multifocal innovation: optical and material enhancements lead to more satisfied presbyopic patients. *Optom Vis Sci.* 2009;86:E-abstract 095557. **3.** In a randomized, subject-masked clinical trial at 6 sites with 47 patients; significance demonstrated at the 0.05 level; Alcon data on file, 2008. **4.** Based on a third-party industry report, 12 months ending October 2012; Alcon data on file.

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fees? Again, once you've determined that a patient is interested in wearing contact lenses, a conversation about the costs should be immediate and should take place right in the exam room. Whether it is the doctor or a staff member who will discuss the process and go over the associated fees, this step needs to be done before the patient gets to the checkout desk.

2. Differentiate the Coding for Elective Contact Lens Wearers

Contact lens wearers do require more time and follow-up; that additional service is worth something. When setting the various levels of fees, it is important to consider whether it's an established contact lens patient, a first-time multifocal wearer or a newly-diagnosed keratoconic patient. The fee will most likely have a range from the least (straightforward evaluation) to the highest (very challenging).

Use CPT 92310, which is defined as: "Prescription of optical and physical characteristics of and fitting of contact lens, with medical supervision of adaptation; corneal lens, both eyes, except for aphakia."[1]

Note that CPT 92310 is for both eyes. If you're prescribing and fitting for only one eye, add modifier -52 (for "reduced services"). In addition, because "elective contact lenses" may be a covered benefit by your refractive carriers, it's vital that you understand what your obligations are under your contract.

3. Discuss and Disclose Fees with a Contact Lens Agreement Form

Assign your staff to help with some of the contact lens-related duties. For example, technicians can discuss the fitting process, expected follow-up visits and appropriate fees depending on the patient's prescription needs.

Fees can be a hurdle for some patients, and some are surprised that there's an extra cost for this service. Our technicians can handle many of these inquiries and can head off any uncomfortable situations to avoid such surprises.

To that end, consider developing a contact lens agreement form to discuss the fees and any associated follow-up appointments. (*See "Sample Annual Contact Lens Agreement," page 52.*)

4. Use the Unique Codes for Aphakic Fits

Aphakic contact lens fits are often reimbursed through the patient's medical carrier. Keep in mind that this service is separate from any evaluation and management services or general ophthalmological services, which should be reported using the appropriate code (99000 or 92000 series) if that level of service was performed and met.

The codes for aphakic contact lens fits are either 92311 (for one eye) or 92312 (for both eyes). CPT defines these as:[1]

- **92311**: "Prescription of optical and physical characteristics of and fitting of contact lens, with medical supervision of adaptation; corneal lens for aphakia, one eye."
- **92312**: "Prescription of optical and physical characteristics of and fitting of contact lens, with medical supervision of adaptation; corneal lens for aphakia, both eyes."

Make sure to bill the appropriate material code (V code) that most closely matches the material and design of the lenses:

- **V2513**: Gas-permeable lens, extended wear, per lens.
- **V2530**: Hybrid contact lens.
- **V2531**: Gas-permeable scleral lens, per lens.
- **V2599**: Contact lens, other type, per lens.

5. Use the Unique Codes for Therapeutic Lens Fits

Since January 1, 2012, there has been a change in the CPT codes for therapeutic contact lenses. CPT Code 92070 was retired and replaced with the following codes:

- **92071**: Fitting of contact lens for treatment of ocular surface disease.
- **92072**: Fitting of contact lens for management of keratoconus, initial fitting only.

Unfortunately, not every medical insurance carrier will pay for these codes. So, contact the patient's medical insurer in advance to determine what, if anything, they will pay for before proceeding. It's important that the patient knows the total amount that they will owe *before* you provide the services, rather than after.

6. Don't Neglect Ocular Surface Disease

Ocular surface disease is a very familiar situation that many eye care professionals encounter. Providing medical eye care to these patients can be a powerful addition to an optometric practice, which includes bandage contact lenses (rigid or soft). Bandage soft contact lenses can help relieve pain and promote healing in patients with trauma to the cornea, and larger diameter scleral lenses are often prescribed for other ocular surface conditions.

Corneal abrasion is one of the most common uses for these lenses in primary care practices. In the presence of a corneal abrasion, bandage soft contact lenses shield the corneal surface from the constant mechanical irritation of the blinking

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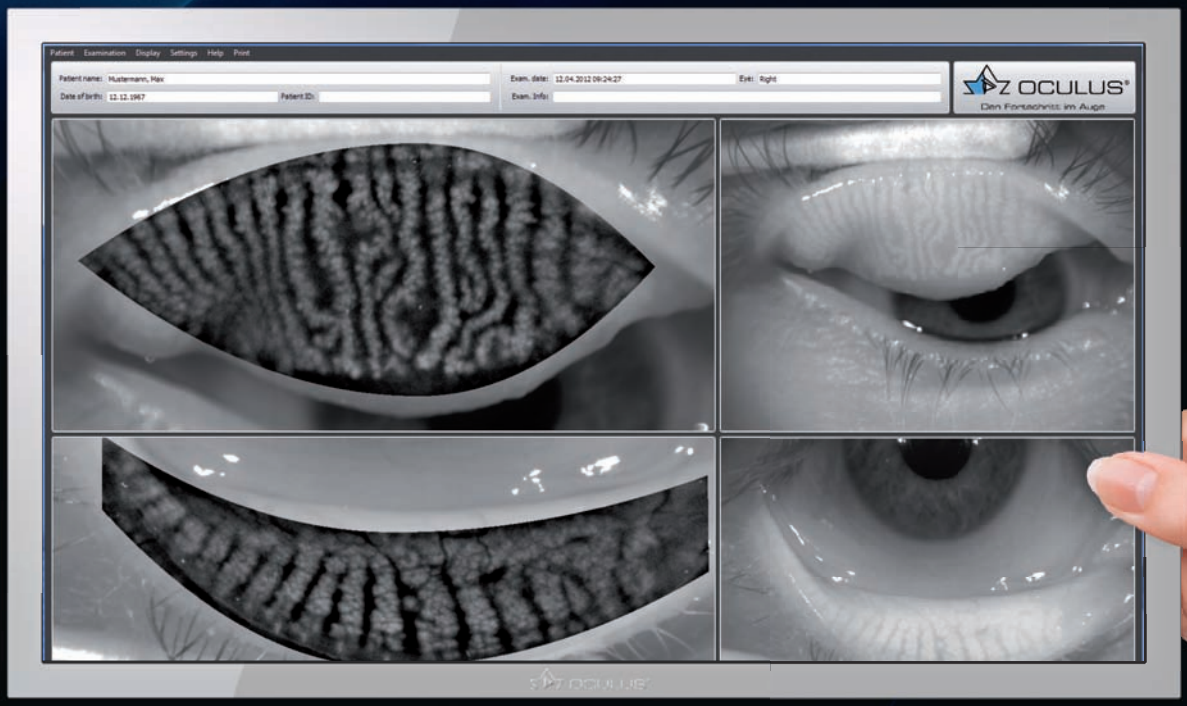

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Annual Contact Lens Agreement

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A **Contact Lens Evaluation** fee is necessary to renew the current contact lens prescription and is in addition to the comprehensive eye examination fee. This evaluation will include precise measurements, analysis of your vision needs and recommendations specifically tailored for you. It may also include the use of diagnostic lenses if necessary by our doctors to ensure the proper fit of the lenses and good ocular health.

The Contact Lens Evaluation fee will range in price depending on the complexity of contact lenses worn:

- **Standard** Contact Lens Evaluation (Soft Spherical) . . . . . **$X**
- **Superior** Contact Lens Evaluation (Toric, Extended Wear, Multifocal) . . . . . **$X**

A **Contact Lens Fit Evaluation** or **Re-fit Evaluation** is necessary if the patient has no previous history of contact lens wear or if there is a need/desire to change the current contact lens fit. This charge will be in addition to the comprehensive eye examination fee. This fee will cover the initial evaluation and all contact lens related follow-up visits for a period of 3 months. If necessary, it will also include the cost of any additional contact lens training classes needed for those individuals needing contact lens instruction for insertion, removal and lens care.

The **Contact Lens Fit Evaluation/Re-fit Evaluation** fee will range in price depending on the complexity of contact lenses worn:

- **Standard** Contact Lens Re-fit Evaluation (Soft Spherical) . . . . . **$X**
- **Advanced** Contact Lens New Fit (New Wearer) or Refit (Toric, Extended Wear) . . . . **$X**
- **Superior** Contact Lens New Fit (New Wearer) or Refit (RGP, Multifocal, Hybrid) . . . . **$X**
- **Medical** Contact Lens New Fit or Refit (CRT, Post Surgical, Keratoconus). . . . . **$X**

Note: Follow-up visits may not be included in some Medical Fits

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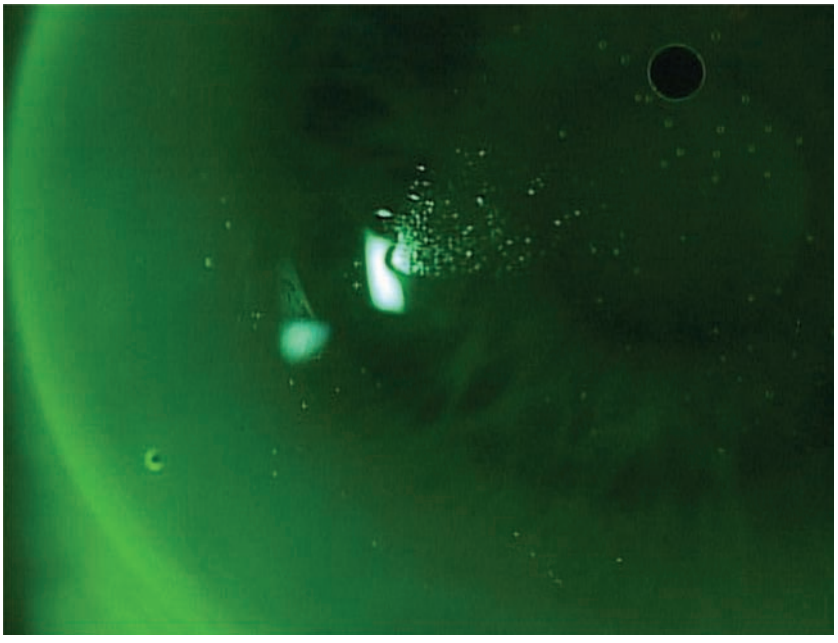

A large-diameter GP lens vaults the cornea of a post-LASIK patient. Do you think this lens is "medically necessary"? Of course—but not every insurance plan will agree.

eyelids. Once the lens is placed on the eye, patients feel considerable comfort almost immediately and, by controlling the pain, they can return to normal function.[2,3]

For the billing and coding, you would:

• Bill the office visit at the appropriate level (92xxx or 99xxx), if performed and recorded.

• Bill for the fitting of the contact lens for the treatment of the ocular surface disease (CPT 92071). Be sure to indicate the specific eye (RT or LT) because this code is unilateral in nature.

• Bill a material fee as well. Choose either CPT 99070 (supplies and materials, except spectacles, provided by the physician over and above those usually included with the office visit or other services rendered) or the appropriate V code, most likely V2523 (contact lens, hydrophilic, extended wear, per lens).

Note that many providers are typically using a disposable contact lens for this purpose and it is inappropriate to bill for a non-revenue lens (trial or diagnostic lens) if you have provided that.

7. Take Care with Specialty Services, like Keratoconus

Many patients require specialty contact lenses for either vision or comfort reasons. Specialty lenses are valued for their ability to mask corneal irregularities associated with various diseases, including keratoconus. If you're working with a vision plan:

• The benefit for "medically necessary" contact lenses is usually in addition to, and not a substitute for, eyeglasses. Check to see if you can obtain spectacles for your patient as well.

• Complete a pre-authorization form to determine the patient's eligibility ahead of time.

For a keratoconus contact lens fit submitted to the medical carrier:

• Bill the office visit at the appropriate level (92xxx or 99xxx), if performed and recorded.

• Bill the fitting of the contact lens for the treatment of keratoconus (CPT 92072—a bilateral code).

• Bill a material fee with the most appropriate V code (most likely V2530, V2531 or V2599).

92072 describes the act of fitting the keratoconus lenses for both eyes, establishing parameters and ordering the lenses. It does not include the follow-up visits, which should be charged separately using the most appropriate office visit code (99xxx or 92xxx).

It is a travesty that some carriers do not perceive this service (92072) as a covered medical service and will not reimburse for it. These patients often desire and need special medical attention and too often the bill often falls back on the patient; be sure to use an Advance Beneficiary Notice of Noncoverage (ABN) appropriately and within the guidelines as provided by the carrier.

Your contact lens business is vitally important to the success of your optometric practice. These steps will improve your in-office protocols and the ability to be reimbursed appropriately for your time and expertise. ■

Dr. Miller is in a partnership practice in Powell, Ohio. He is an extern preceptor for fourth-year students at The Ohio State University College of Optometry, and he is one of the doctors (along with Chuck Brownlow, OD, and Walter Whitley, OD, MBA) behind AOA's AskTheCodingExperts@ExcelOD.com.

1. CPT definitions. AOACodingToday. Available at: www.aoacodingtoday.com. Accessed March 4, 2012.
2. Buglisi JA, Knoop KJ, Levsky ME, Euwema M. Experience with bandage contact lenses for the treatment of corneal abrasions in a combat environment. Mil Med. 2007 Apr;172(4):411-3.
3. Brujic M, Miller J. Alternative uses for contact lenses. Rev Cornea Contact Lenses. 2009 Mar: 146(2):12-3.

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Streamlining Your Multifocal Fitting Process

Not all success comes from simplicity, but it does make the job easier.

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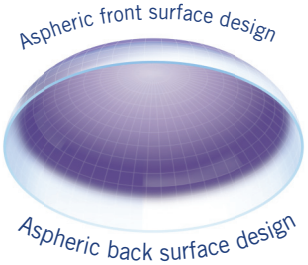
Another way I increase my fitting success is by offering near correction to patients as soon as accommodative decline is evident. Trouble focusing at near often begins in a patient's mid to late 30s, and I am surprised at the number of patients in their late 30s who could benefit from near correction.



Aspheric front and back surfaces enhance image quality and facilitate fit

Why not begin the presbyopia conversation with patients in their early 30s? Educating patients about this unavoidable condition before it affects them goes a long way in earning their respect, instilling trust and possibly garnering the referral of their friends.

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AIR OPTIX® AQUA Multifocal contact lenses have a Precision Profile Lens Design to help streamline the fitting process. And the lens' bi-aspheric surface provides enhanced image quality and ease of fit across a wide range of corneal curvatures.

Transitioning patients from sphere lenses to AIR OPTIX® AQUA Multifocal contact lenses with a LO ADD is simple and makes the conversion into higher ADD ranges nearly effortless later on. Once you determine the prescription and ADD range, following the provided Fitting Guidelines is easy.

After the initial fit, I have patients go about their lives for two weeks before returning to the office. At this visit, I ask for their feedback, examine their performance in the lenses and discuss possible ways to improve the fit.

The adaptive minus power profile allows for a smooth progression of power gradients from center-near, to intermediate, and distance. This allows for clear binocular vision and minimizes aberrations at all distances. The center-near design allows for enhanced visual range and works synergistically with the eye's natural function. It is available in a wide range of powers and ADDs, enabling practitioners to find that perfect fit to accommodate a wide range of presbyopic patients.

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Marketing Contact Lenses to the Public: Boon or Bane?

Doctors weigh in on the pros and cons of direct-to-consumer advertising for contact lens products, and how it affects their relationships with patients.

By Jane Cole, Contributing Editor

You can't escape. Turn on your TV, log onto Facebook or pick up a magazine and you'll find them. Direct-to-consumer (DTC) advertising has exploded over the past decade. And with the advent of social media, your patients are being exposed to a constant bombardment of ads that try to influence their decision making about contact lens products.

Patients are becoming more educated on potential options as a result, and some ODs point to a changing dynamic of patient/doctor relationships.

"There is something wrong with a 30-second TV commercial making the patient believe they know better than the doctor's years of professional training and clinical experience," says optometrist Brian Chou of San Diego. "While consumer-driven marketing can increase patient demand for eye care services, these patients sometimes view the time and cost of these services as an impediment to receiving the contact lens rather than something necessary and desirable."

Here, your colleagues weigh in on the positives and negatives this type of advertising ultimately has on your patients and your practice.

Positives of DTC

Besides New Zealand, the United States is currently the only other country that permits direct-to-consumer advertising for drugs and medical devices.

In 1981, Merck ran the first DTC print ad for its then new antipneumococcal vaccine, Pneumovax, in *Reader's Digest*.

Although DTC ads for contact lenses had being used off and on for years, in 2005 a silicone hydrogel contact lens hit the big time during the Super Bowl, when advertisers paid an average of $2.4 million for 30 seconds of airtime for a prime time slot.[1]

Today, direct-to-consumer advertising is easily a multibillion-dollar-a-year investment for pharmaceutical companies; now medical devices, such as contact lenses, are also quickly gaining steam in the marketing landscape.

Despite some misgivings, ODs say there are tangible benefits:

• ***Informs the patient.*** "Direct-to-consumer advertising does a good job of bringing contact lenses to the top-of-mind," says optometrist Jeffrey Sonsino of the Vanderbilt Eye Institute in Nashville. "It may drive patients who are dissatisfied with their lenses into our offices for a trial of a newer material. The lens manufacturers are always careful to say, 'See your eye doctor.'"

DTC advertising can raise public awareness about new contacts,

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such as multifocals, single-use lenses and silicone hydrogels. Consequently, today's patients are much better educated on soft contact lens modalities than a decade ago when Ohio optometrist Mile Brujic first began practicing, he says. The knowledge gained through DTC advertising can simplify the patient/doctor conversation in the exam room.

"Now you often can jump right into a discussion of what you think is the best modality for a patient, as opposed to going over some of the basic fundamentals of contact lenses that we used to have to explain," Dr. Brujic says.

This goes beyond contact lens products, too. "I can't remember the last time I told someone about Restasis to treat their dry eye and had them say, 'I've never heard of that product before.' The prevalence of direct-to-consumer advertising makes communicating about the technology easier," he says.

• ***Drives patients to your office.*** Another argument for direct-to-consumer advertising is that these types of ads encourage patients to seek the advice of their doctor.[2] This is especially helpful for people who otherwise would have have neglected to do so, Dr. Chou says.

"In turn, some of these patients will have undiagnosed eye conditions and underlying systemic conditions with ocular manifestations detected, which may have never occurred without the DTC advertising," he adds.

"That it brings patients into our office is a good thing," says optometrist Joseph Shovlin of Scranton, Pa. "I sometimes object to direct-to-consumer ads because it places me in an awkward position if I don't use the product. But, I'm always happy to point out to patients that they may be best served by another option or product—even if that's from a different company."

Jason Miller, OD, of Powell, Ohio, agrees that ads that drive patients to a practice—whether they are a fit for a specific lens or not—is a positive. "If a patient is in my chair, I'll say, 'You know what, that lens may not be the best one for you, but here are some other options that would be perfect for you.'"

We can control patient perceptions to some degree. If optometrists allow DTC advertising to control what patients are doing, then they've missed the boat, Dr. Miller says. "Every patient creates an opportunity for their eye doctor to educate them on their eye health and how often they need to be seen when they are in our office."

And the Cons

• ***"Free" trial lens.*** A sticking point for most ODs interviewed is the promise to patients of the "free trial lens," especially if the manufacturer does not build in the value of the required contact lens service and the patient doesn't see the fine print about the cost of the exam. Then, the practice's staff has to deliver the bad news that services with an associated cost are required.

• ***Excess chair time.*** Additionally, patients may think that they are candidates for lenses that aren't suitable for their prescription, which then requires re-education in the exam room, Dr. Brujic says.

Because it must reach a mass audience, "DTC advertising is not specifically tailored to any given patient, meaning it can lead consumers to request inappropriate contact lenses, resulting in patient dissatisfaction if the practitioner prescribes something other than what the patient wants," says Dr. Chou.

He gives this example: A patient with uncontrolled blepharitis and a history of marginal ulcers would not be a good candidate for continuous wear. Yet, DTC advertising of a 30-day continuous wear-approved lens may lead this patient to wear their silicone hydrogel lenses continuously for 30 days, even if the practitioner advises against doing this. "In these cases, the additional discussion absorbs chair time that could have been better directed to a more important issue that benefits the patient without further taxing the doctor's limited time," Dr. Chou says.

Every patient who sees a direct-to-consumer advertisement for extended wear wants this modality, adds Dr. Sonsino. "However, we know from well-designed clinical studies that extended wear increases the risk of microbial keratitis six- to seven-fold over daily wear lenses. That risk is no better with silicone hydrogel," he says.

When patients point out that these lenses must be OK because the companies advertise it, Dr. Sonsino responds, "They advertise Big Macs but that doesn't mean they're good for you." Though safely used by many patients, they may not be ideal for every patient.

• ***Losing faith in you.*** Additionally, as consumers increasingly trust information from social media and manufacturers, the value they place on practitioners may decrease.

"The efficacy of this marketing can establish a greater bond between the consumer and the manufacturer, ahead of the doctor-patient relationship," Dr. Chou says. "When this happens, the consumer ends up caring more

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No Rx? No Problem!

Just because nobody replies doesn't mean the Rx is OK. That's the sentiment of a recent blog post by Dr. Bazan after he took on direct-to-consumer-advertising behemoth 1-800-Contacts.

Curious as to whether the company that advertises, "We beat any price on contact lenses" would ship him an order of contacts without a valid Rx, Dr. Bazan went online and placed a bogus order. He provided an inaccurate prescription and chose a random doctor from the drop-down menu on the 1-800-Contacts order page.

The result? "I was able to order contacts that are not even close to the right power, size, shape or material for my eye. Dangerous! And, I was able to choose a doctor whom I never heard of," he says.

Because of a loophole in the Fairness to Contact Lens Consumers Act, Dr. Bazan's mock order did ship, because the doctor he selected did not respond to 1-800-Contacts within eight business hours.

"The passive verification system is a joke," Dr. Bazan says. "If you want contacts, you can get them—no need for a valid Rx. Patients will bypass care if we fail as doctors to motivate them to return for their annual exam." ODs need to do a better job at educating their patients and demonstrating the value of the annual exam, he says. "If docs continue to make it seem like an annual contact lens exam is no big deal, then the patient feels the same way. They think, 'Why do I need to go in for that? I know my Rx and I'm seeing just fine, so I will just order them online.'"

about where he or she can get the specific advertised contact lens than caring about the quality of service."

It is incumbent on doctors to inform patients about their best options, Dr. Brujic adds. So, when patients see direct-to-consumer ads on television, they aren't second-guessing the quality of care they are receiving from their doctor.

• ***Too cost conscious.*** Another con: Some advertising directs a consumer to order contacts online, which encourages the patient to do a lowest price comparison, says Brooklyn's Justin Bazan, OD. "The chances of losing the sale are high if you are not competitive. And in this day and age, it's becoming increasingly harder to be competitive and remain profitable.

The frequency of people buying elsewhere has noticeably increased, he says. "Patients are bombarded with ads, deals, coupons, discounts, sales, etc. They are now super-aware that they have options, and they must consider looking online if they want the best deal."

Dr. Bazan easily spotted ads on Facebook and YouTube for certain brands of contacts being sold at or near his practice's cost. "As this dwindling product profitability continues, contact lens companies must realize that there are other clinically equivalent products that maintain profitability better, and it's those products that docs will fit with preference if need be," he says.

To stay competitive with the heavily advertised online alternatives, Dr. Miller ships contact lens orders directly to his patients at no extra charge, even if they order only a three-month supply.

Ranking the Ads

"I welcome the ads that emphasize the need for routine eye health exams and follow-up care for contact lens wear because they don't trivialize the importance of eye health and what can be detected with a routine examination," Dr. Shovlin says. He points to the dental profession's success with this strategy. "They have everyone worried that your teeth might fall out without seeing your dentist every six months."

These "see your doctor" ads are excellent for fostering the relationship between doctor and patient, Dr. Brujic says.

Dr. Bazan has implemented his own such ads on his practice's Facebook page, and says they have been successful in targeting patients who are overdue for their eye exams.

However, "see your doctor" ads are too few and the ones that promote a specific product are too many, according to Dr. Chou. "This is understandable, because the contact lens manufacturers want return on investment for their advertising dollars. Unfortunately, most ads emphasize products while minimizing the value of the doctor's services and clinical judgment."

Product-specific ads can cause confusing messages for the patients who may think they are ideal candidates for a particular lens they saw advertised on TV. And often the messages that these ads put forth should instead be conversations held between the optometrist and the patient, Dr. Brujic says. As a result, you need to recalibrate patient expectations that are driven by this product-specific marketing, he adds.

As for corporate advertising from alternative distributors such as 1-800-Contacts and Walmart that tout inexpensive pricing on contact lenses, optometrists need to communicate with patients: What you offer is indeed different.

"I think all the advertising by 1-800-Contacts and other alternative distributors continues to create the consumer perception that contact lenses are a retail good that is non-prescriptive and can be selected like a pair of shoes," Dr. Chou says.

Whenever someone advertises on price, they want the consumer to have the perception that what he or she is getting is pretty much the same regardless of the distribution method—they are just offering it at a lower price, Dr. Brujic adds. "This gives ODs the opportunity to say, 'No, they actually aren't the same.' It gives us a different way to differentiate ourselves and the services we provide."

Dr. Miller echoes this sentiment: "I try to play in a different field. I'm not going after the same patient. There are some patients who want to go to a quick in-and-out place or a type of place that isn't service related, but price driven." He differentiates visiting his practice with superior service. "I recently saw an ad on TV from an optical chain offering two pairs of glasses and a free eye exam for $79.99. I think that's embarrassing to our profession, and not what's happening in most optical and optometry offices across the board."

And, as Walmart is ready to launch a new daily disposable contact lens called Equate (as part of its in-store brand), a heavy DTC pitch will likely ensue. "I believe the effort will generate widespread ire among eye care practitioners when this lens is marketed directly to patients," Dr. Chou says. "It'll be interesting to see how private practitioners will respond to requests by patients to prescribe this lens so that they can go purchase them at Walmart."

As for the future, Dr. Chou predicts: "One of the consequences of DTC advertising is that, in the consumer-driven mindset, the consumer will attribute successful contact lens wear to their brand of lens. Yet the ideal situation is for the patient to attribute success to their practitioner's expertise. My strong conviction is that a thriving contact lens practice requires the latter." ■

1. Chou B. Direct-to-consumer advertising of contact lenses: help or hazard? Available at: http://legacy.revoptom.com/index.asp?ArticleType=SiteSpec&page=osc/105269/lesson.htm. Accessed April 8, 2013.
2. Boden WE, Diamond GA. DTCA for PTCA: Crossing the line in consumer health education? N Engl J Med. 2008;358(21):2197-200.

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References: 1. In vitro measurement of contact angles on unworn lenses; significance demonstrated at the 0.05 level; Alcon data on file, 2009. **2.** Nash W, Gabriel M, Mowrey-McKee M. A comparison of various silicone hydrogel lenses; lipid and protein deposition as a result of daily wear. *Optom Vis Sci.* 2010;87: E-abstract 105110. **3.** Ex vivo measurement of lipid deposits on lenses worn daily wear through manufacturer recommended replacement period; CLEAR CARE® Cleaning and Disinfecting Solution used for cleaning an disinfection; significance demonstrated at the 0.05 level; Alcon data on file, 2008.

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Disorders of the Nasolacrimal System

Too many teardrops? It could very well be caused by an obstruction, an infection or another problem within the nasolacrimal system.

By Todd Dimmick, OD, and Andrew Gurwood, OD

The nasolacrimal system, with its many intertwined and interrelated mechanisms, is a vital component of ocular homeostasis. This important system enables the spreading, distributing and elimination of the tear constituents across the ocular surfaces (palpebra, fornix and bulbar conjunctivae and cornea). The system supports the tear layer of the eye, which is essential to ocular surface health.

But if a problem arises with the system—causing symptomatic overproduction of tearing or a lack of tears—you should perform an appropriate workup for ocular surface disease and lacrimal system obstruction. To that end, this article explains the pathophysiology and management of these disorders.

Tear Flow Dynamics

Excluding evaporation, the tear volume on the anterior surface of the eye remains relatively constant both when the eye is open and during the closing portion of the blink. On average, the eye's fornix holds 7µl of liquid when a person is in the upright position. (By comparison, the average eye drop is 20µl to 30µl).[2-6]

Tear drainage occurs via the lacrimal pump mechanism.[1-7] With the start of each blink, the pars ciliaris portion of the orbicularis at the eyelid margin (the muscle of Riolan) assists lid-globe congruity and wipes tears along the corneal surface and towards the puncta via a squeegee effect.[2-6] Simultaneously, the pars lacrimalis (Horner's muscle) contracts around the lacrimal sac, pushing tears already collected in the sac further into the system. One-third of the way through the complete blink, the puncta occlude one another.[4] As the sac is contracted, a negative pressure is created as the puncta oppose each other.[2-6]

When the eye opens after a blink, tension relaxes on the lacrimal sac, the canaliculi and lacrimal sac re-expand, the puncta "pop" apart and the negative pressure created by the designed constriction draws tears back into the apparatus, refilling the lacrimal sac and canaliculi, and recycling the system.[4,5,6,7]

Blockage of the lacrimal drainage system may cause tear overflow or epiphora.[5,6] Infection of the lacrimal sac gives rise to dacryocystitis.

Release Date: April 2013
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Goal Statement: The nasolacrimal system is a vital component of ocular homeostasis. But if a problem arises with this system, the tear layer—and therefore the health of the ocular surface—is jeopardized. Despite the importance focused on the ocular surface, the significance of the nasolacrimal system is often overlooked. This detailed course reviews the many potential pathophysiologic problems that can occur within the nasolacrimal system, and offers practical management solutions for dealing with these disorders.
Faculty/Editorial Board: Todd Dimmick, OD, and Andrew Gurwood, OD
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Anatomy of the Nasolacrimal System

To understand the nasolacrimal system and its regulation of the tear film, we must first understand the nasolacrimal anatomy.

Each eyelid normally has one punctum situated along its margin in the region of its nasal canthus. These puncta define the beginning of the nasolacrimal apparatus. (This is the "canalicular" eyelid.) Each punctum leads into its superior and inferior canaliculus, which extends 2mm in the vertical direction to the ampulla reservoir. From the ampulla, the canaliculus turns 8mm medially toward the nasolacrimal sac.[1,2] In 90% of the population, the superior and inferior canaliculi come together to form a common canaliculus that drains into the lacrimal sac.[1] In 10% of the population, each canaliculus connects directly into the lacrimal sac.[1] The nasolacrimal apparatus continues through the 10mm lacrimal sac to exit inferiorly. Here, fluid flow is regulated by both muscular contraction and the valve of Krause.[1]

The lacrimal sac becomes the 12mm nasolacrimal duct, traversing a bony duct bounded by the lacrimal and maxillary bones. Along this route is the regulatory valve of Rosenmuller.[1,3] The final 5mm of the lacrimal duct is membranous and opens into the inferior meatus, lateral to the inferior turbinate. The valve of Hasner is situated at the distal end of the duct (this valve may be imperforate in newborns, and opens spontaneously in a large percentage).[1,3] The valve of Hasner functions as a unidirectional valve that allows tears to drain out of the lacrimal system while preventing upward flow. The valve also functions to block nasal fluid entry during pressure events like coughing or sneezing.[1,3]

The punctal opposition naturally prevents tear regurgitation during the event, while the valves within the system (much like valves in the venous circulatory system) prevent backflow.[2,9]

Evaluation

The tear film and ocular adnexal health can be evaluated without the use of instrumentation. Magnified examination of the tear film and the associated ocular tissues is accomplished using the biomicroscope or by observing the lacrimal lake with a Burton lamp. Fluorescein dye can be added to the tear meniscus and observed using cobalt blue illumination.

Overabundance of tears, lack of tears, rapid evaporation of tears, poor tear coverage over the ocular surfaces, damage to the cornea or to the conjunctiva must all be included in the differential diagnosis of symptomatic lacrimation.

The Jones test can be used to determine whether nasolacrimal apparatus obstruction is present (canalicular obstruction). It is accomplished by placing 2% fluorescein into the inferior cul-de-sac of the eyelid and attempting to visualize or retrieve fluorescein from the ipsilateral nostril.[11] A modified Jones test describes placing granules of an artificial sweetener such as saccharin into the tear lake to see if the patient can eventually taste it, confirming at least some tear flow through the system.

Tear production deficiency can be assessed by Schirmer testing and the phenol red thread test. These tests quantify basal tear production and assist analysis of whether a patient's epiphora is secondary to poor tear movement or paradoxical tear release secondary to underlying malproduction. Normal results are 10mm to 15mm or more of tear saturation along the strip.[11] Poor tear volume could signal tear underproduction.

Cases of paradoxical tearing (overproduction of lacrimal fluid as stimulated by an underproduction of ocular surface lubrication) must be managed by treating the underlying cause. Poor tear production requires tear replacement therapy (artificial tears, Restasis [cyclosporine A, Allergan]) or tear drainage interruption (punctal plugs or cautery), and a medication and environmental review (systemic medications or circumstances altering tear production or efficiency). Evaporative disease can be caused by acne rosacea, which is treated with oral cycline antibiotic therapy, topical antibiotic and steroid therapy along with gland evacuation (Lipiflow, TearScience) and surface support.

Disorders of the nasolacrimal system include:

Canalicular Obstruction

• ***Pathophysiology.*** Unilateral epiphora (tear overflow) almost always suggests ipsilateral lacrimal drainage system obstruction. Such obstruction can occur due to mechanical means or from processes that induce canalicular closure (stenosis).[12-14] Sources of mechanical obstruction can include debris from the lids and lashes (blepharitis, chronic conjunctivitis or makeup) and obstruction from retained punctal plugs that are lodged below the punctum.[12-14]

Age-related constriction or scarring from adnexal trauma or from chronic infection (herpes simplex virus [HSV] or human papilloma virus [HPV]) may also render the system unpassable.[14-16] Although these etiologies are known anecdotally, a study published in 2010 proposed that HSV, HPV, makeup and sex hormones had no statistical significance on canalicular obstruction.[17]

• ***Management.*** Individuals who suffer from mechanical canalicular obstruction—whether it be from debris from the lids and lashes, retained punctal plugs, age-related constrictive processes (stenosis) or

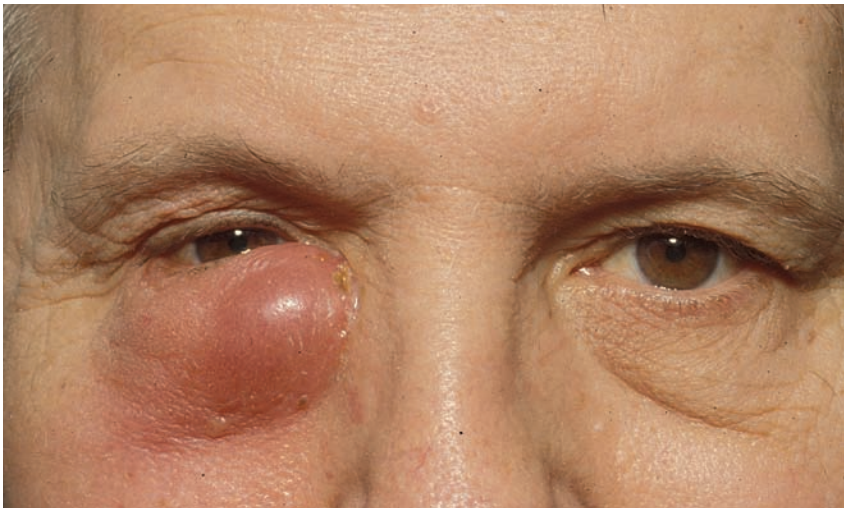
chronic apparatus infection—generally complain of epiphora without pain.

As the condition continues, the chemistry of the tears and the erosion of the epidermis from tear wiping may cause ulcerative fissures at the canthal areas and along the lid margins.[12-18]

First aid involves cold compresses, cleaning the lids and lashes (lid scrubs), and instituting appropriate antibiotic drops and ointments to prevent infection and to moisturize the tissues.[12-17] Surgical repair is only necessary in non-remitting cases. Cases of chronic eyelid infection/inflammation (blepharitis, rosacea, psoriasis or eczema) require topical and oral antibiotics in addition to anti-inflammatory agents.

In cases when the treatment does not mitigate the problem or when there is either constrictive limitation or a punctal plug stuck in the system, irrigation and punctal dilation may be attempted.[12-17] Following dilation, irrigation of a sterile saline wash is slowly flushed through the system until it is tasted by the patient, which indicates system patency.

If the solution cannot be circulated or it consistently regurgitates from the superior punctum, this may indicate that a more significant blockage or mass is present.[11,18] If repositioning and reinjection is unsuccessful, refer the patient to an oculoplastic surgeon or one experienced in nasolacrimal system evaluation.



Photos: Allan Wujc, MD

Dacryocystitis with preseptal cellulitis. A painful, firm, round nodule, with adjacent preseptal eyelid cellulitis and mucopurulent discharge that can be regurgitated with palpation.

Dacryocystitis

• ***Pathophysiology.*** Dacryocystitis is an infection of the lacrimal sac (lacrimal sac mucocele). It can occur as result of acute or long-standing lacrimal system obstruction or from bacterial infection sourced to the contents of the tear film. Dacryocystitis may also result from the elements or remnants of trauma or as an extension of infective and inflammatory processes occurring within the nose or paranasal sinuses.[18-21]

The mucosa that lines the lacrimal sac and nasal lacrimal duct are inherently resistant to microbial invasion.[19-21] When a blockage occurs within the pathway, tears (laden with inflammatory material) begin to accumulate. The overabundance of inflammatory cytokines induces changes in the mucosal cellular structure.[19-21] Alterations in the ductal epithelium and the lamina propria encompassing the lacrimal sac and nasolacrimal duct allow microbial buildup, creating an environment unopposed to the seeding of infection.[19-21] The most common gram-positive organisms include *Streptococcus pneumonia* and *Staphylococcus aureus*, while *Haemophilus influenza, Pseudomonas aeruginosa* and *Serratia marcescens* are the leading the gram-negative bacteria.[19,20]

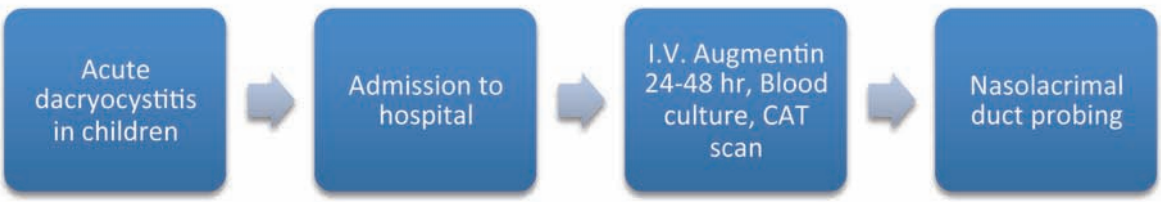
Dacryocystitis is more common in the fifth to sixth decade of life, with a mean age of 55.5 years. It can be acute or chronic in nature.[19-21] Females tend to have blockages in the nasolacrimal drainage system more often than men, with the incidence of dacryocystitis highest in postmenopausal women.[19-21] This likely occurs because the bony lacrimal duct is smaller in women than in men. Dacryocystitis is normally not seen in patients under age 30 unless there is some form of congenital nasolacrimal duct obstruction or facial trauma.[18]

Acute dacryocystitis often presents with symptoms of severe pain of the inner canthus in the area of the lacrimal sac just under the medial canthal ligament. Tearing, secondary conjunctivitis, mucoid discharge in the morning and an enlarged, chronically infected lacrimal sac are all clinical signs. A firm, round nodule, with adjacent cellulitis or preseptal eyelid cellulitis, is often palpable. The lacrimal sac may be "decompressable," allowing mucopurulent reflux to emerge from the puncta upon direct pressure on the sac.[18-22]

• ***Management.*** Acute onset dacryocystitis is initially managed conservatively with warm compresses, massage, topical antibiotic drops, topical antibiotic ointments and a

Adult Dacryocystitis Treatment Flowchart

Pediatric Dacryocystitis Treatment Flowchart



seven- to 10-day course of oral antibiotics.[19] The topical antibiotics of first choice include the fourth-generation fluoroquinolones. However, data demonstrate that the organisms involved in acute dacryocystitis also respond well to gentamicin and chloramphenicol.[19]

The oral antibiotics of first choice include Augmentin (amoxicillin/clavulanic acid, GlaxoSmithKline), Keflex (cephalexin, Eli Lilly) and Levaquin (levofloxacin, Ortho-McNeil).[19]

Natural percutaneous abscess drainage is often completed through the punctum (milking the lesion) in order to relieve pain and to obtain a culture.

Dacryocystitis in children is managed more aggressively because it has a high risk of causing sepsis due to a child's immature immune system.[19,21] In these instances, admission to the hospital is common so that prompt blood culture, CT scan and IV therapy can be instituted. Treatment in admitted cases is usually accomplished using intravenous Augmentin and probing of the nasolacrimal system.[19]

When conservative treatments fail, surgical solutions are needed in both acute and chronic cases.[19-22] Dacryocystorhinostomy (DCR) is the gold standard for treating acute adult dacryocystitis.[19-22] DCR is defined as the resection of the bony area around the nasolacrimal canal to gain access to the stenotic area within the drainage system. The procedure permits the shunting of tear flow around any blockage by creating a new anastomotic passageway.[19-22] Interestingly, the procedure is gaining momentum as an intervention because it permits the surgeon the advantage of being able to immediately drain and culture the abscess.

New techniques of completing DCR include endocanalicular laser and endoscopic intranasal surgical techniques.[19] These revolutionary methods permit the cavity to be accessed without opening the entire passage.[19]

The choice of the procedure depends upon the suspected etiology of the blockage and the experience of the surgeon.[19] The advantage of the endoscopic procedure is good success rate for creating a nasolacrimal pathway through the bone with improved cosmesis.[19]

Dacryocystocele

• ***Pathophysiology.*** Dacryocystocele is defined as a diffuse enlargement of the lacrimal sac due to a congenital nasolacrimal duct obstruction that causes the sac to fill with tears and secretions of the cells lining the sac.[22-24] The obstruction is distal to the sac and typically the result of a functional blockage in the area of the valve of Hasner.[22,23] Proximal blockages are usually due to obstructions at the level of the valve of Rosenmuller.[22,23]

The distal obstruction site (valve of Hasner) commonly becomes blocked when the mesodermal lining of the apparatus does not canalize properly before birth, leaving an imperforate nasolacrimal duct.[22-24] Proximal obstruction site

blockages occur when an enlarged sac creates a pressure difference, causing the common canaliculus or valve of Rosenmuller to collapse on itself.[22] This creates a "ball valve" mechanism, allowing tears to flow into the apparatus without an avenue of escape.[22,23]

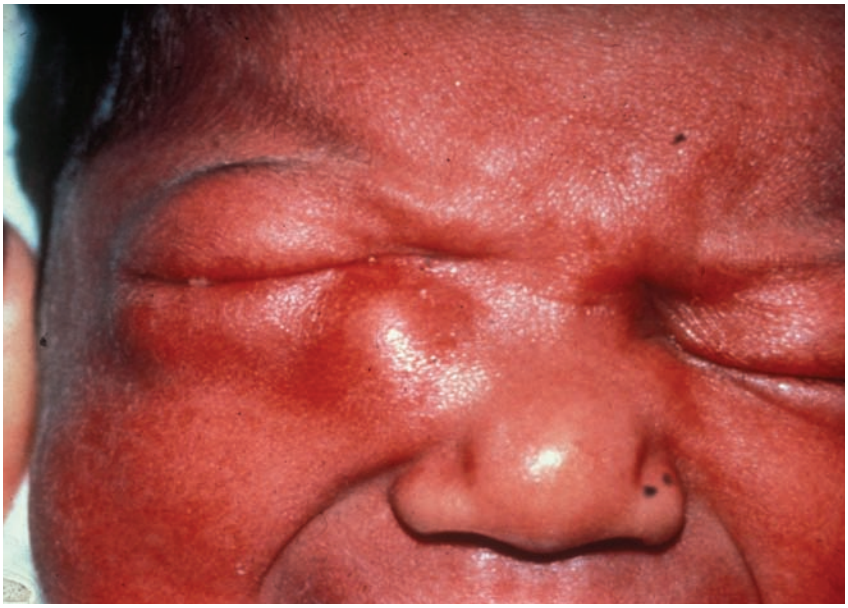
Signs and symptoms typically include bluish, cyst-like diffuse enlargement of the lacrimal sac just underneath the medial canthal tendon.[22-24] The area of elevation tends to be painless and is absent of erythema unless a concomitant dacryocystitis is present.[22-24] In infants, epiphora and trouble breathing during breast feeding is commonly seen.[22-24]

Dacryocystocele is most commonly seen in infants.[22-24] This condition also tends to affect females more commonly than males.[23]

• ***Management.*** Conservative medical management is indicated in congenital dacryocystocle.[22,23] This includes warm compresses with gentle circulating massage, along with a short course of prophylactic topical antibiotics to prevent the formation of dacryocystitis. In many cases, the conservative approach results in recanalization of the system and complete resolution of symptoms.[22,23]

Surgical intervention is required only when conservative treatment fails, respiratory function is compromised or if infection occurs.[22,23] Surgical intervention is considered immediately in most adult cases, which usually require dacryocystorhinostomy with or without a stent.[22,23]

Surgery in congenital cases is usually accomplished with probing of the lacrimal system. In most instances, the probing alone is enough to collapse thin-walled cysts. However, when probing fails, marsupialization (widely opening the cyst, permitting drainage) prevents future blockages and infection.[22-24]



Dacryocystocele in a neonate. A dacryocystocele is cyst-like diffuse enlargement of the lacrimal sac that tends to be painless and bluish in nature.

Canaliculitis

• ***Pathophysiology.*** Canaliculitis is an inflammation/infection of the canalicular aspect of the lacrimal drainage system.[25-27] Canaliculitis typically happens when a partial obstruction occurs within the canaliculi.[26] This leads to tear stagnation, which in turn creates an environment capable of supporting anaerobic bacterial growth.[25-27]

Canaliculitis is among the most frequently missed diagnoses in ocular practice, often requiring two or more office visits to be correctly identified.[25,26] The delay in proper diagnosis is due to the combination of its rarity and the similarities of other differentials.[25,26]

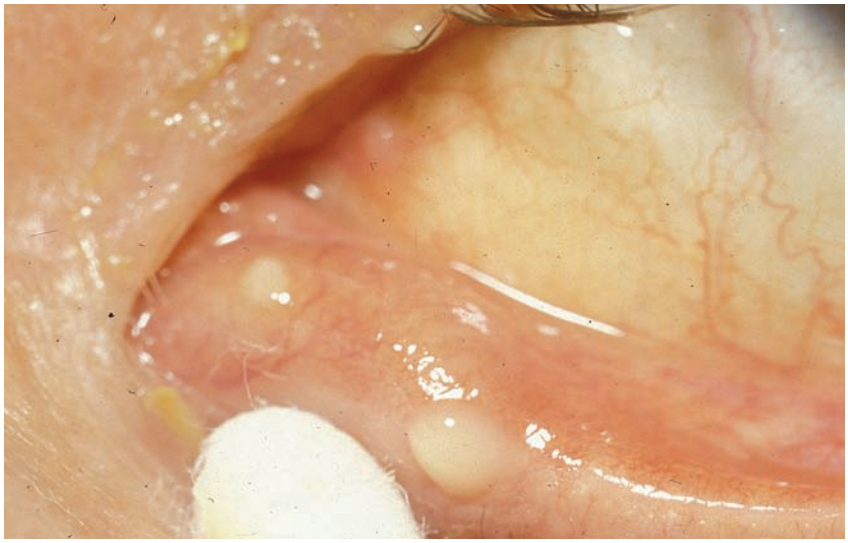
Canaliculitis most often occurs in postmenopausal women, with a mean age of 59 years.[25] It can be caused by bacteria, viruses or fungi. Signs and symptoms include ipsilateral epiphora, a swollen red lower lid and a pouting (turned outward) punctum often accompanied by mucopurulent discharge that may or may not contain yellow granules (dacryoliths).[25-27]

Another distinguishing characteristic of canaliculitis is that it gives rise to recurrent conjunctivitis. Here, even when the infected canaliculus is identified and correctly treated with appropriate topical medications, the solution is only temporary.[25] When the topical medication is withdrawn, infection recurs.

In canaliculitis, the presence of canalicular foreign bodies impedes the penetration of medication and makes cure unlikely unless they are removed surgically.[25]

• ***Management.*** The medical management of canaliculitis consists of warm compresses, massage, topical antibiotics and irrigation of the nasolacrimal system with the appropriate antibiotic, antifungal or antiviral agents.[25-26]

Conservative treatment, to be effective, must be started within the first 30 days that symptoms become apparent. After this period, small particulate obstructions known as



Canaliculitis with discharge and dacryolith seen in left lower lid.

dacryoliths form.[25-27] These impediments block the ability of any irrigating agent from reaching the root source of blockage, making that mode of treatment ineffective.[25-27]

In cases where dacryoliths are identified, dilation of the punctum along with curettage of the canaliculus can sometimes be enough to remove the stones.[25, 27] Dacryoliths should be cultured so that an appropriate irrigating agent can be selected. In stubborn cases, canaliculotomy provides better access for dacryolith removal.[25, 26]

Lacrimal Neoplasms and Encephaloceles

• ***Pathophysiology.*** Malignant or nonmalignant growths are also plausible sources of nasolacrimal obstruction.[28] The lacrimal system frequently remains open and patent to irrigation in benign lacrimal sac tumors, whereas complete obstruction is associated with sac carcinomas.

Seventy-two percent of lacrimal sac tumors are malignant.[28] Nasopharyngeal carcinomas can involve the lacrimal sac.[28] Malignant epithelial tumors tend to spread along the epithelium proximally toward the eyelids and distally to the inferior nasal turbinate.[28] Although lacrimal sac tumors are rare, it is important to include them in the differential diagnoses of epiphora, recurrent dacryocystitis and/or lacrimal sac mass.[24,28]

Encephaloceles (herniation of intracranial tissue through the embryological anatomical component known as the foramen cecum or fronticulus frontalis), nasal gliomas and dermoids (cystic tumors that arise from embryonic epidermis that has become self-encapsulated) may masquerade as lacrimal sac abnormalities or mimic the signs and symptoms of dacryocystitis.[29] However, these unusual entities are completely unrelated, resulting from alterations in embryologic development.[22,29] The most accepted theory of pathogenesis is that the forebrain protrudes through a faulty anterior neuropore during early lacrimal apparatus deveplopment.[29,30]

Of the lacrimal encephaloceles, nasal gliomas can be differentiated from dacryocystitis by their differing appearance: encephaloceles appear as soft, bluish nodules that swell upon Valsalva maneuver.[24,29-31]

• ***Management.*** Neurosurgical techniques may be necessary in order to manage nasal gliomas (tumor of glial cells). Some intracranial lesions with nasal extension may require frontal craniotomy.[29]

Encephaloceles, once diagnosed, are traditionally managed to prevent cosmetic deformity.[29]

Fine-needle capillary sampling through the lower lacrimal punctum and canaliculus, with rapid cytologic testing, is required to make the diagnosis of malignancy and to facilitate early surgical intervention. Fine-needle cytology has a reported 100% concordance in differentiating benign vs. malignant orbital and eyelid lesions.[8] In addition, the fine-needle capillary technique was found to be better than the aspiration technique in terms of smear quality, sensitivity and postsurgical discomfort induced.[8]

Multidisciplinary management is recommended in these sometimes complicated cases.[8] Wide excision through a lateral rhinotomy results in a lower recurrence rate and is favored over the dacryocystorhinostomy approach.[8] Pre- and/or post-op radiotherapy has been recommended for malignant epithelial tumors.[8] Lifelong follow-up is essential.

Lacrimal Diverticulum

• ***Pathophysiology.*** The general definition of a diverticulum is an outward herniation of tissue.[8,32] A lacrimal diverticulum involves the lacrimal sac, resulting from either a developmental malformation or an abnormality produced by local trauma.[24,32] When these diverticula form, the base of their outpouchings can become inundated or occluded, producing swelling and inflammation. Back pressure can produce tearing, dacryocystocele and even dacryocystits.[24,32]

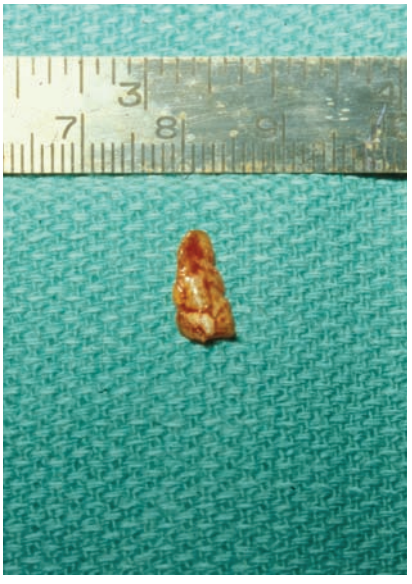
• ***Management.*** There is no true

medical management for lacrimal diverticula. Cases involving suspected nasolacrimal neoplasms require immediate imaging.[29-31,32] Lacrimal diverticula can be managed conservatively with warm compresses and massage but, over time, they tend to succumb to the forces of bacterial sequestration, becoming infected and requiring lacrimal drainage surgery.[32]

Acute Dacryocystic Retention (Lacrimal Sac 'Stone')

• ***Pathophysiology.*** Lacrimal sac "stones"—dacryoliths—are similar to gallstones.[33,34] Their composition and formation is poorly understood. Dacryoliths can create complete or partial nasolacrimal duct obstruction independent of the patient's age or history of acute dacryocystitis.[33,34]

Cigarette smoking has been observed as a statistically significant risk factor.[33,34] Males seem to be affected more often, with dacryolith discovery being part of the initial presentation along with lacrimal sac distention.[33,34]



Lacrimal stone, similar to a gallstone, can create complete or partial nasolacrimal duct obstruction.

Different Cysts and Nodules in Nasolacrimal Disorders

Dacryocystitis	Severe pain of the inner canthus just under the medial canthal ligament; mucoid discharge; secondary conjunctivitis; firm round nodule with adjacent cellulitis or preseptal eyelid cellulitis
Dacryocystocele	Painless, bluish, cyst-like diffuse enlargement underneath the medial canthal tendon; epiphora; in infants, trouble breathing when breast-feeding
Encephaloceles	Soft, bluish nodules that swell upon Valsalva maneuver
Nasal gliomas	Subdivisions of lacrimal encephaloceles
Epidermoid and dermoid cysts	Fleshy, yellow-colored cysts, firm to the touch, superior to the medial canthus along the nasofrontal suture line
Congenital lacrimal fistulae	Small orifices or pits, inferonasal to the medial canthal angle; drainage of a mucoid discharge

• ***Management.*** The painful symptoms initially produced by lacrimal sac stones resolve in most instances without any intervention.[33,34] When intervention is required, punctal dilation with irrigation is the accepted first-line treatment strategy, provided there is no concurrent cellulitis or dacryocystitis.[33,34] If an infection is present, it must be resolved using oral and topical antibiotic therapy along with supportive hot compresses. If dilation with irrigation fails to recanalize the passage, dacryocystorhinostomy can be attempted.[33,34]

Lacrimal Epidermoid and Dermoid Cysts

• ***Pathophysiology.*** Epidermoid and dermoid cysts tend to be a fleshy-yellow color and are firm to the touch.[13,15,32] They can be diagnosed based upon their appearance and are usually found superior to the medial canthus. These orbital cysts are normally found over the areas of bone sutures and are adhered to the periosteum that underlies them.

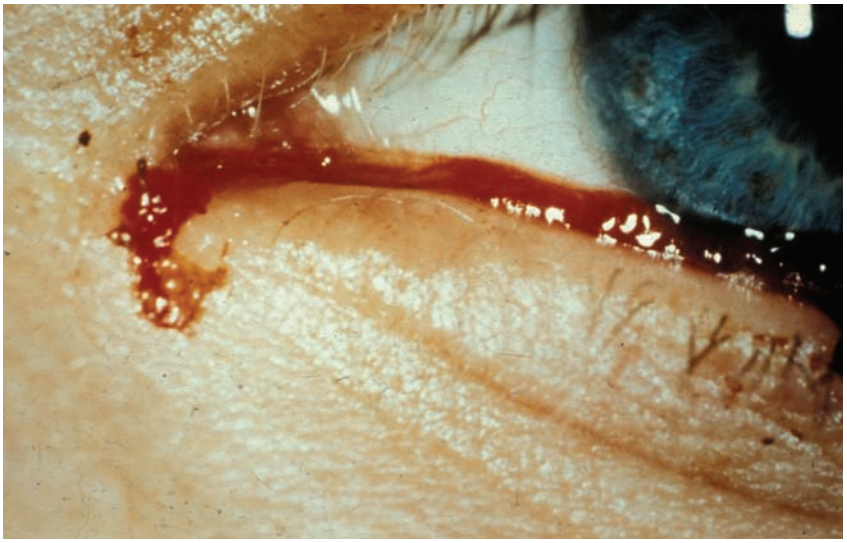
Epidermoid cysts are differentiated from the dermoid cysts by their cellular composition (underlying keratinized stratified squamous cells).[35]

• ***Management.*** These cysts can be identified and localized with neuroimaging. Removal can be accomplished using a number of procedures, such as a superior nasal orbit incision and removal of the lesion without dissection.[35]

Canalicular Lacerations

• ***Pathophysiology.*** Canalicular lacerations are created when an insult to the face causes a rupture of the skin along the canalicular portion of the eyelid. Lacerations can involve the upper, lower or both canaliculi.[36,37] The eyelids are more susceptible to avulsion in the area medial to the punctum.[36] This is because there is a lack of connective tissue (the tarsal plates are absent) in this area and because mechanical failure is at greatest risk in areas where tissues are weakest.[36]

The pathophysiology of blunt injuries remains constant, direct and



Hemolacria, or "bloody tears," occur secondary to a concomitant disease process, so the underlying cause must first be identified.

indirect impact with shear force or penetration disrupts the skin and canalicular apparatus.[36,37] Consistent with the general statistics seen with trauma, canalicular lacerations occur most often in young males around the age of 30.[36,37]

• ***Management.*** Surgical intervention is indicated for canalicular lacerations. Ectropion, overflow epiphora, poor tear spread, eyelid deformity and eventually visual complications can occur if wound closure is not properly performed.[37] Multiple techniques of canalicular repair have been described, including bicanalicular silicone tube intubation, monocanalicular intubation (Mini Monoka, FCI Ophthalmics) and nasolacrimal duct intubation.[37,38]

Generally, repair is accomplished with localization of the lacerated medial edge of the canaliculus. A stent is then threaded through the punctum and through the lateral and medial edges of the laceration, leaving an intact tube to stent the canalicular edges open while they heal.[37,38] The lacerated eyelid is then sutured over the stent with dissolvable sutures and the canalicular edges are reapproximated microscopcially.[37]

Lacrimal Fistula (Congenital)

• ***Pathophysiology.*** Congenital lacrimal fistulae represent rare anomalies in development.[8] The majority of fistulae originate from the common canaliculus; however, they can also arise from the lacrimal sac.[8] The incidence of congenital lacrimal fistulae is estimated to be one in 2,000 births, and are generally inherited in an autosomal dominant fashion.[8] Cohorts with an autosomal recessive inheritance pattern have also been reported in the literature.[8]

Lacrimal fistulae are often asymptomatic and nonprogressive, appearing as small orifices or pits that may go undetected.[8] While most fistulae are unilateral, familial cases are associated with a higher incidence of bilateral fistulae. The location of congenital lacrimal fistulae is characteristically inferonasal to the medial canthal angle.[8] Symptoms such as drainage of a mucoid discharge or epiphora may necessitate surgical excision/correction.[8]

Lacrimal fistulae share associations with preauricular fistulae, hypospadias (congenital urethral displacement) and VACTERL syndrome (vertebral anomalies, anal atresia, cardiac malformations, tracheo-esophageal fistulae, renal anomalies and limb anomalies).[8] Congenital lacrimal fistulae have been associated with thalassemia (blood cell abnormality involving altered hemoglobin chain) and Down syndrome.[8] Associated ocular pathology includes dacryocystitis, lacrimal tract stenosis and infections of the lower eyelid.[8]

• ***Management.*** A wide range of treatment modalities for symptomatic lacrimal fistulae have been discussed in the literature.[8] They range from nasolacrimal duct probing and cauterization of the external ostium to surgical excision of the fistula, either alone or in combination with dacryocystorhinostomy.[8] For patients who are asymptomatic or minimally symptomatic, observation is a reasonable approach.[8]

Punctal Agenesis

• ***Pathophysiology.*** Punctal agenesis (not present/failure to develop) is associated with the absence of underlying canalicular tissue.[39] When one or both puncta are absent, there is a reasonable possibility that no canalicular tissue was formed.[39] In symptomatic cases, surgical exploration is required to determine if a maldeveloped canalicular apparatus is present and can be salvaged or if one needs to be constructed.[39]

• ***Management.*** The treatment of choice for punctal agenesis is some form of DCR. If more than 8mm of proximal healthy canaliculus exists, standard DCR is performed and incorporates that healthy tissue.[39,40]

If less than 8mm is present, then a conjunctivodacryocystorhinostomy (CDCR) is performed. The CDCR procedure differs from the DCR,

as it dictates making an incision at the caruncle.[40] In CDCR, a needle is passed from the caruncle into the nasal cavity to allow for the creation of a fistula and the insertion of a bypass tube.[40] This procedure or variation creates an anastomosis from the conjunctiva to the nasal cavity to permit the maintenance of proper tear drainage, and bypasses the missing punctal opening and canalicular tissue.[40]

Bloody Tears (Hemolacria)

• ***Pathophysiology.*** Hemolacria means "bloody tears."[41,42] It is associated with conjunctival capillary hemangioma, conjunctival telangiectasias, bacterial conjunctivitis, lacrimal sac tumors, lacrimal sac infections, nasal and paranasal sinus tumors, hereditary hemorrhagic telangiectasia, Henoch-Schönlein purpura (IgA-mediated small vessel disease) and retrograde epistaxis.[41] Further, hemolacria may occur in women spontaneously during the menstrual period.[42] There have been cases of idiopathic hemolacria with no identifiable cause.[41,42]

• ***Management.*** Because bloody tears occur secondary to a concomitant disease process, the underlying cause must be discovered with an appropriate workup. Idiopathic cases are a diagnosis of exclusion.[41,42]

Dysfunction of the blink mechanism and its articulated wiper effect, obstruction of the puncta, obstruction or compromise of the nasolacrimal canaliculi, obstruction or infection within the nasolacrimal sac, or any formation of cystic or malignant growth can give rise to excessive, non-remitting tearing as well as collateral symptoms.

Diagnosis is facilitated by observing the tissues (conjunctivae, eyelids, cilia, surrounding glands), the blink mechanism at work, the puncta and overlying adnexa, performing tear chemistry tests, tear secretion tests, tear recovery tests, and performing dilation of the puncta with irrigation of the corresponding nasolacrimal drainage system. Eradication of infection can be accomplished with oral, topical and intravenous antibiotics. Infections or traumas, which induce scarring and chronic system failure, require oculoplastic management. Congenital malformations and acquired diseases of the canaliculi and nasolacrimal system can be managed with system reconstruction and stenting. ■

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1. Francisco FC, Carvalho AC, Francisco VF, et al. Evaluation of 1000 lacrimal ducts by dacryocystography. Br J Ophthalmol. 2007 Jan;91(1):43-6.
2. Oyster CW. The Eyelids and the Lacrimal System. In: Oyster CW. The Human Eye Structure and Function. Sunderland, Mass.: Sinauer Associates, Inc.; 1999:291-320.
3. Paulsen FP, Schaudig U, Thale AB. Drainage of tears: impact on the ocular surface and lacrimal system. Ocul Surf. 2003 Oct;1(4):180-91.
4. Van Santvliet L, Ludwig A. Determinants of eye drop size. Surv Ophthalmol. 2004 Mar-Apr;49(2):197-213.
5. Johnson ME, Murphy PJ. Temporal changes in the tear menisci following a blink. Exp Eye Res. 2006 Sep;83(3):517-25.
6. Sahlin, S, Chen E, Kaugesaar T, et al. Effect of eyelid botulinum toxin injection on lacrimal drainage. Am J Ophthalmol. 2000 Apr;129(4):481-6.
7. Stoeckelhuber M, Stoeckelhuber BM, Welsch U. Human glands of Moll: histochemical and ultrastructural characterization of the glands of Moll in the human eyelid. J Invest Dermatol. 2003;121(1):28-36.
8. Zhuang L, Sylvester CL, Simons JP. Bilateral congenital lacrimal fistulae: a case report and review of the literature. Laryngoscope. 2010;120 Suppl 4:S230.
9. Doane MG. Blinking and the mechanics of the lacrimal drainage system. Ophthalmology. 1981 Aug;88(8):844-51.
10. Wilson G, Merrill R. The lacrimal drainage system: pressure changes in the canaliculus. Am J Optom Physiol Opt. 1976 Feb;53(2):55-9.
11. Hagele JE, Guzek JP, Shavlik GW. Lacrimal testing: Age as a factor in Jones testing. Ophthalmology. 1994 Mar;101(3):612-7.
12. Deangelis D, Hurwitz J, Mazzulli T. The role of bacteriologic infection in the etiology of nasolacrimal duct obstruction. Can J Ophthalmol. 2001 Apr;36(3):134-9.
13. Hidayat AA, Weatherhead RG, Al-Rajhi A, Johnson FB. Conjunctival and lacrimal sac pigmentation by kohl (eyeliner). Br J Ophthalmol. 1997 May;81(5):418.
14. Harley RD, Stefanyszyn MA, Apt L, Nelson LB. Herpetic canalicular obstruction. Ophthalmic Surg. 1987 May;18(5):367-70.
15. Yoshida M, Hondo R. Transmission of herpes simplex virus infection via lacrimal canaliculi. Ophthalmologica. 1992;204(2):101-2.
16. Migliori ME, Putterman AM. Recurrent conjunctival papilloma causing nasolacrimal duct obstruction. Am J Ophthalmol. 1990 Jul 15;110(1):17-22.
17. Kashkouli MB, Sadeghipour A, Kaghazkanani R, et al. Pathogenesis of primary acquired nasolacrimal duct obstruction. Orbit. 2010 Feb;29(1):11-5.
18. Jones LT. An anatomical approach to problems of the eyelids and lacrimal apparatus. Arch Ophthalmol. 1961 Jul;66:111-24.
19. Pinar-Sueiro S, Sota M, Lerchundi T, et al. Dacryocystitis: Systematic approach to diagnosis and therapy. Curr Infect Dis Rep. 2012 Jan 29;14(2):137-146.
20. Pinar-Sueiro S, Fernandez-Hermida RV, Gibelalde A, et al. Study on the effectiveness of antibiotic prophylaxis in external dacryocystorhinostomy: a review of 697 cases. Ophthal Plast Reconstr Surg. 2010 Nov-Dec;26(6):467-72.
21. Paulsen FP, Thale AB, Maune S, Tillmann BN. New insight into the pathophysiology of primary acquired dacryostenosis. Ophthalmology. 2001 Dec;108(12):2329-36.
22. Perry LJ, Jakobiec FA, Zakka FR, Rubin PA. Giant dacryocystomucopycele in an adult: a review of lacrimal sac enlargments with clinical and histopathologic differential diagnoses. Surv Ophthalmol. 2012 Sep;57(5):474-85.
23. Wong RK, VanderVeen DK. Presentation and management of congenital dacryocystocele. Pediatrics. 2008 Nov;122(5):e1108-12.
24. Fussell JN, Wilson T, Pride H. Case report: Congenital dacryocystocele and dacryocystitis. Pediatr Dermatol. 2011 Jan-Feb;28(1):70-2.
25. Freedman JR, Markert MS, Cohen AJ. Primary and secondary lacrimal canaliculitis: a review of literature. Surv Ophthalmol. 2011 Jul-Aug;56(4):336-47.
26. Vécsei VP, Huber-Spitzy V, Arocker-Mettinger E, Steinkogler FJ. Canaliculitis: difficulties in diagnosis, differential diagnosis and comparison between conservative and surgical treatment. Ophthalmologica. 1994;208(6):314-7.
27. Pavilack MA, Frueh BR. Through curettage in the treatment of chronic canaliculitis. Arch Ophthalmol. 1992 Feb;110(2):200-2.
28. Low JR, Bian Ng S, Sundar G. Undifferentiated carcinoma of the lacrimal sac: case report and review of literature. Orbit. 2011 Dec;30(6):293-6.
29. Rahbar R, Resto VA, Robson CD, et al. Nasal glioma and encephalocele: diagnosis and management. Laryngoscope. 2003 Dec;113(12):2069-77.
30. Patterson K, Kapur S, Chandra RS. "Nasal gliomas" and related brain heterotopias: a pathologist's perspective. Pediatr Pathol. 1986;5(3-4):353-62.
31. Puppala B, Mangurten HH, McFadden J, et al. Nasal glioma presenting as neonatal respiratory distress: definition of the tumor mass by MRI. Clin Pediatr (Phila). 1990 Jan;29(1):49-52.
32. Sinnreich Z. Lacrimal diverticula. Orbit. 1998 Sep;17(3):195-200.
33. Yazici B, Hammad AM, Meyer DR. Lacrimal sac dacryoliths: predictive factors and clinical characteristics. Ophthalmology. 2001 Jul;108(7):1308-12.
34. Gonnering RS, Bosniak SL. Recognition and management of acute noninfectious dacryocystic retention. Ophthal Plast Reconstr Surg. 1989;5(1):27-33.
35. Lelli GJ, Levy RL. Epidermoid cyst masquerading as dacryocystocele: case report and review. Orbit. 2011 Mar;30(2):114-5.
36. Jordan DR, Ziai S, Gilberg SM, Mawn LA. Pathogenesis of canalicular lacerations. Ophthal Plast Reconstr Surg. 2008 Sep-Oct;24(5):394-8.
37. Leibovitch I, Kakizaki H, Prabhakaran V, et al. Canalicular lacerations: repair with the Mini-Monoka monocanalicular intubation stent. Ophthalmic Surg Lasers Imaging. 2010 Jul-Aug;41(4):472-7.
38. Hussain RN, Kanani H, McMullan T. Use of Mini-Monoka stents for punctal/canalicular stenosis. Br J Ophthalmol. 2012 May;96(5):671-3.
39. Lyons CJ, Rosser PM, Welham RA. The management of punctal agenesis. Ophthalmology. 1993 Dec;100(12):1851-5.
40. Athanasiov PA, Madge S, Kakizaki H, Selva D. Diagnostic and surgical techniques: a review of bypass tubes for proximal lacrimal drainage obstruction. Surv Ophthalmol. 2011 May-Jun;56(3):252-66.
41. Ozcan KM, Ozdas T, Baran H, et al. Hemolacria: Case report. Int J Pediatr Otorhinolaryngol. 2013 Jan;77(1):137-8.
42. Praveen BK, Vincent J. Hematidrosis and hemolacria: a case report. Indian J Pediatr. 2012 Jan;79(1):109-11.

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1. Which part of the nasolacrimal anatomy allows tears to drain out of the lacrimal duct into the inferior nasal meatus, and prevents both upward flow and nasal fluid entry during sneezing?
a. Punctum.
b. Lacrimal sac.
c. Valve of Hasner.
d. Orbicularis oculi muscle.

2. The average eye's fornix holds how much liquid (when a person is in the upright position)?
a. 7µl.
b. 17µl.
c. 27µl.
d. 37µl.

3. At what point during the complete blink do the punctae occlude one another?
a. 1/8 the way.
b. 1/5 the way.
c. 1/3 the way.
d. 1/2 the way.

4. Tear regurgitation back into the eye is prevented naturally by:
a. Valve of Rosenmuller.
b. Valve of Kraus.
c. Valves of Kraus and Rosenmuller.
d. Superior and inferior puncta opposing each other upon the blink.

5. Which test determines whether nasolacrimal apparatus obstruction is present?
a. Jones test 1.
b. Placing granules of an artificial sweetener such as saccharin into the tear lake to see if the person can eventually taste it.
c. Schirmer test 2a.
d. Both a and b.

6. Unilateral epiphora almost always suggests:
a. Ipsilateral dry eye.
b. Ipsilateral hemiparesis.
c. Ipsilateral lacrimal drainage system obstruction.
d. All of the above.

7. Which is the typical treatment for a "stuck" punctal plug?
a. Cold compresses.
b. Irrigation and dilation.
c. Lid scrubs.
d. Referral to an oculoplastic surgeon.

8. Dacryocystitis is common in which demographic?
a. Patients in the fifth to sixth decade of life.
b. Patients with a history of congenital nasolacrimal duct obstruction or facial trauma.
c. Postmenopausal women.
d. All of the above

9. What is the first-choice oral antibiotic to treat acute-onset dacryocystitis?
a. Augmentin (amoxicillin/clavulanic acid, GlaxoSmithKline).
b. Cephalosporins (i.e., Levaquin [levofloxacin, Ortho-McNeil]).
c. Gentamycin.
d. All of the above.

10. How is dacryocystitis in children managed differently than in adults?
a. Treatment is more aggressive because pediatric dacryocystitis is high risk.
b. Admission to the hospital for IV therapy is common.
c. Probing of the nasolacrimal system is often diagnostic and therapeutic.
d. All of the above.

11. If conservative treatments fail, which surgical method is the gold standard for acute adult dacryocystitis?
a. Irrigation and dilation.
b. Dacryocystorhinostomy.
c. Conjunctivodacryocystorhinostomy.
d. None of the above.

12. In dacryocystocele, the proximal obstructions occur secondary to:
a. Distal obstructions with secondary valve of Rosenmuller collapse.
b. Hasner valve misdirection.
c. Imperforate nasolacrimal apparatus.
d. Secretory dysfunction with infection.

13. What medical management is indicated in congenital dacryocystocele?
a. Surgical intervention is required when conservative treatment fails, respiratory function is compromised or if infection occurs.
b. Surgical intervention is always required in congenital dacryocystocele.
c. Warm compresses with gentle circulating massage along with a short course of prophylactic topical antibiotics until recanalization and complete resolution occurs.
d. Both a and c.

14. Canaliculitis is a frequently missed diagnosis because:
a. It is a condition that is rarely seen.
b. It shares similarities with many other differentials.
c. It improves when treated with topical antibiotics.
d. All of the above.

15. Canaliculitis is caused by:
a. Bacteria.
b. Viruses.
c. Fungi.
d. All of the above.

16. Why is it advantageous to start canaliculitis treatment within 30 days of symptoms?
a. Conservative treatment without expression always works.
b. After this time period, small particulate obstructions known as dacryoliths form, making conservative treatment ineffective.
c. Surgical treatment is the only way to resolve canaliculitis.
d. All of the above.

17. How are encephaloceles differentiated from dacryocystitis?
a. Encephaloceles appear as soft, bluish nodules that swell upon Valsalva maneuver.
b. Severe, inner canthus pain in the area of the lacrimal sac just under the medial

OSC QUIZ

canthal ligament.
c. Encephaloceles are fleshy, yellow-colored masses that are firm to the touch.
d. Dacryocystitis is never painful.

18. Eyelid lacerations tend to form in the area of the canaliculus because:
a. Periorbital fat in this area is thick.
b. There is a lack of connective tissue in this area.
c. Mechanical failure risk is greatest where tissues are weakest.
d. Both b and c.

19. Why is surgical intervention indicated for the treatments of canalicular lacerations?
a. It prevents ectropion.
b. It prevents overflow epiphora.
c. Deformity can result in visual complications from chronic surface disease.
d. All of the above.

20. Congenital lacrimal fistulae have been associated with:
a. Thalassemia and Down syndrome.
b. Cicatricial disease.
c. Previous trauma fallout.
d. Congenital phimosis.

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Arrest These 'Suspects'!

Normal-tension suspects may cause you to scratch your head. But you don't have to refer these patients, if you examine them carefully. **Edited by Paul C. Ajamian, OD**

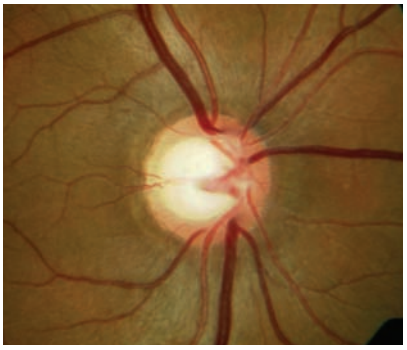
Q I see many young and middle-age patients in my office with normal pressures but large physiologic cups. I'm afraid I might miss something if I don't send them out. How do you handle this?

A "Normal-tension glaucoma in young patients (under 50 years) is relatively uncommon, unless other factors—like low blood pressure or migraines—are present," says Michael Chaglasian, OD, associate professor at Illinois College of Optometry and chief of staff of the Illinois Eye Institute, in Chicago. "Normal-tension glaucoma is even more uncommon for people in their 20s or 30s, which suggests that your patient probably has physiological cupping."

So, you don't need to send out all such patients. But, to avoid missing any problems in them, Dr. Chaglasian suggests these steps:

• *Measure the optic disc size.* This can easily be done at the slit lamp with dilated view, he says. Use a vertical and horizontal beam of light to begin and end at the outer disc margins. Take the millimeter reading (located on most slit lamps) and multiply by 1.3 when using a 90D lens (with a 78D lens, take the reading as is).

"Large discs have a large physiologic cup," so a large disc with a large cup is not universally a strong risk factor for glaucoma, Dr. Chaglasian says. For whites, disc size of 1.8mm^2 is average, while greater than 2.2mm^2 is large. Hispanics and blacks have a larger average disc size of about 2.2mm^2.



A 45-year-old patient with large physiological cupping, IOP of 21mm Hg—and normal visual fields.

• *Look for symmetry.* Strong symmetry of cupping and disc size suggests normal physiology, while asymmetry suggests glaucoma.

• *Look carefully for focal notching.* "Focal notching at the neuroretinal rim is a strong indicator of true glaucomatous damage," Dr. Chaglasian says. While thinning of the rim tissue all around the cup may indicate glaucoma in some patients, it is more often physiological. Presentations of a disc hemorrhage or peripapillary atrophy do suggest glaucoma damage and require further investigation.

• *Obtain a visual field.* "Use a thresholding strategy for optimal sensitivity," he says. "You don't need blue-yellow technology."

• *Consider OCT imaging.* "While OCT evaluation of the retinal nerve fiber layer and optic disc is excellent for many of these patients, it is not absolutely required," Dr. Chaglasian says. If the disc is highly suspicious, then OCT, if available, can help identify retinal nerve fiber layer loss that is associated with early glaucoma.

"If all of your findings—IOP, optic nerve head, visual field—are normal and there are no other significant risk factors (such as family history, pachymetry of 500µm or less, etc.), then it is appropriate to follow the patient about once per year. These are cases that you don't need to refer out," he says.

• *Take photos.* "Baseline disc photographs may be the best test/procedure to get on these patients," Dr. Chaglasian says. "Ten years from now, OCT instruments will be vastly different, but you'll still have a digital photograph to refer to. It can be a lifesaver."

• *Consider something other than glaucoma.* Patients who are under 50, have a repeatable visual field defect, have associated headaches or any other neurologic abnormalities, will most likely require further evaluation with neuro-imaging.

Q If I do send them to a glaucoma specialist, when should I expect to see them back?

A "If everything is normal, these patients should be returned immediately, or whenever they're due for another visit," he says. "Glaucoma specialists should not want nor do they need these patients in their practices." However, if the specialist identifies disease or strong risk factors for glaucoma, the patient will likely require a few extra visits for further testing for the next two to four months. ■

What Are the Odds?

A fairly rare condition, posterior polymorphous corneal dystrophy has a 50/50 chance of getting passed down the family tree. **Edited by Joseph P. Shovlin, OD**

Q I have a patient with posterior polymorphous corneal dystrophy who is the father of four children—two of whom have inherited the disease. What are the chances that his children will pass the condition on to the next generation? Is there genetic testing available?

A The children who inherited the condition should be counseled that each of their offspring would have a 50% chance of developing posterior polymorphous corneal dystrophy (PPCD). The odds that the two unaffected children in the family would pass the condition on to another generation are slim to none.

"If the patient inherits the mutation, they will exhibit the disease in almost all cases," says Anthony J. Aldave, MD, director of the Cornea Genetics Laboratory at UCLA's Jules Stein Eye Institute in Los Angeles. "Could a child of an unaffected individual develop PPCD? It's possible, but highly unlikely."

Inherited as an autosomal dominant trait, polymorphous corneal dystrophy affects the corneal endothelium. Clinical characteristics include vesicle-like opacities and parallel bands in Descemet's membrane. "In later stages, these bands eventually affect endothelial cell function and cause corneal edema," says Sherry J. Bass, OD, distinguished teaching professor at SUNY State College of Optometry in New York. "In addition to corneal edema, patients with PPCD are at risk of developing peripheral anterior synechiae, which—if extensive enough—could result in glaucoma. Some pedigrees also have associated keratoconus." So, it's important to monitor PPCD patients carefully to make sure you're on top of any associated conditions that may arise.

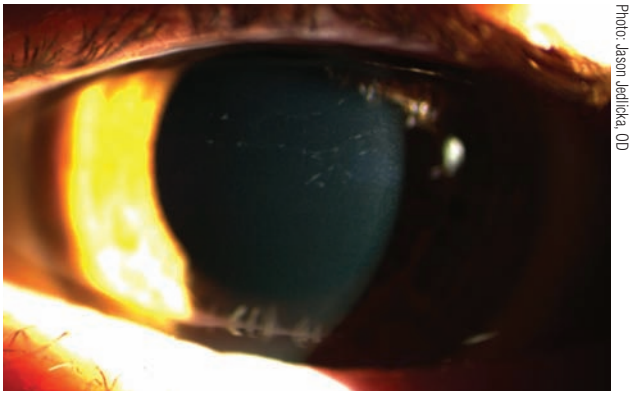


Photo: Jason Jedlicka, OD

This patient exhibited endothelial changes resulting from posterior polymorphous corneal dystrophy.

Dr. Aldave and colleagues have potentially discovered another clinical feature of the condition. In an article currently under review, they describe a significant percentage of patients with PPCD who have steep corneas (defined as an average keratometry value greater than 48.00D in each eye).

"This is probably not just an isolated endothelial dystrophy. This condition likely also affects the corneal stroma," says Dr. Aldave, who recently saw a PPCD patient post-LASIK who had developed ectasia after the surgery. "Optometrists who refer patients to refractive surgeons should be aware that these patients often have steep corneas, and there should be a very careful examination prior to LASIK surgery before considering them as candidates."

Mutations associated with PPCD have been reported in a number of genes, including VSX1, COL8A2 and ZEB1 (although convincing evidence exists only for ZEB1). "Currently, there are no commercial genetic testing laboratories that offer tests for PPCD, although they do offer testing for another gene (TGFB1) that causes some of the stromal corneal dystrophies," Dr. Bass says. "Perhaps genetic testing for PPCD will be offered in the future." At this point, identifying a mutation in an affected individual is mainly for research purposes because it doesn't change the clinical management of the condition.

Most patients with PPCD don't require treatment, but in Dr. Aldave's collection of 46 affected families, more than 20% of patients have required corneal transplantation. Deciding whether penetrating or endothelial keratoplasty is the most appropriate procedure depends, in part, on whether significant corneal steepening is present in addition to endothelial decompensation, Dr. Aldave says. ■

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Imag(in)e That!

Same patient, same nerve. Different objective test results? Certainly!

By James L. Fanelli, OD

A 57-year-old white male transferred care to our office after moving to the area in summer 2012. He had a history of open-angle glaucoma, for which he was medicated with Travatan Z (travoprost, Alcon) HS OU for the past three years. He described his glaucoma as "mild" and that his previous provider initiated therapy more as a "preventative" treatment option. His only systemic medication was lisinopril QD for hypertension.

Diagnostic Data

At his initial visit, best-corrected visual acuity was 20/20 OD, OS, OU through myopic (-3.00D) astigmatic and presbyopic correction. Pupils were round and reactive to light and accommodation with no afferent defect; physiologic anisocoria of 6mm was present in the right pupil and 5mm in the left in ambient light. Extraocular motilities were full in all positions of gaze.

Slit lamp examination of his anterior segments was unremarkable. Anterior chambers demonstrated wide-open angles OU, as estimated by the Van Herick method. Intraocular pressure by applanation tonometry measured 18mm Hg OD and 16mm Hg OS at 11:15 a.m. Central corneal thickness measured 529µm OD and 541µm OS.

Upon dilation, his crystalline lenses appeared clear in both eyes, with partial anterior vitreous separations OU. Stereoscopic evaluation of the optic nerves demonstrated cup-to-disc ratios of 0.55 x 0.85 OD with significant erosion of the inferior temporal neuroretinal rim and 0.50 x 0.55 OS. The inferior temporal rim margin OD sloped from the perioptic retinal nerve fiber layer (RNFL) horizontally to the cup, with lamina visible only in the center of the optic disc. There was a small amount of peripapillary atrophy (beta PPA) located in the inferotemporal aspect of this rim, adjacent to the neuroretinal rim notch.

His retinal vascular evaluations were normal OU, with no evidence of hypertensive retinopathy or retinal arteriolar narrowing in any quadrant of either eye. Macular evaluations also were normal, with loss of only the central foveal reflex. Peripheral retinas were normal with 360º of microcystoid present bilaterally.

We took stereo-optic nerve photos of the optic disc and Heidelberg Retina Tomograph-3 (HRT-3, Heidelberg Engineering) images of his optic nerves. HRT-3 images confirmed neuroretinal rim erosion OD (in the inferotemporal sector) as well as the cup-to-disc asymmetry between the eyes.

Given that this was the patient's first visit to the office, and without any previous records to gauge his stability, I asked him to continue his current therapy and return in three months for further evaluation.

Follow-up

The patient returned as scheduled in November 2012 for threshold field studies, gonioscopy, and optic nerve and posterior pole SD-OCT imaging. At this visit, IOP was 16mm Hg OD and 15mm Hg OS at 2:30 p.m. Heidelberg Edge Perimetry (HEP, Heidelberg Engineering) demonstrated a pronounced arcuate field defect OD and a normal field OS. Reliability indices were good, indicating functional vision loss OD with no loss OS.

Spectralis OCT (Heidelberg Engineering) imaging showed a depressed RNFL in the inferotemporal sector in the right eye, consistent with the HRT-3 images and the clinical optic nerve appearance observed at the last visit. OCT of the left eye demonstrated a normal TSNIT double hump appearance with normal RNFL thicknesses 360º around the nerve.

My intern noted that the optic nerve photograph of the right eye, with what he estimated to be a cup-to-disc ratio of only 0.40 x 0.45, did not correspond to the HRT-3 and the Spectralis OCT image of the right eye.

By this visit, I had received a copy of the patient's record. Threshold standard automated perimetry showed a couple of non-continuous points of field depression in the superior arcuate area OD, and a clean field OS. Cirrus OCT imaging also demonstrated a slightly depressed inferotemporal segment RNFL TSNIT graph in the right eye, and a normal RNFL appearance in the left.

The previous provider described the cup-to-disc ratios as 0.50 x 0.60

OD and 0.45 x 0.50 OS.

Discussion

This case raises the typical questions when a patient transfers care to your office: Is the patient stable? How severe is the glaucoma, and the resultant structural and functional damage? Are there compounding issues that threaten stability, such as vasculopathic disease or narrow angles? What is the patient's overall health? What is the patient's compliance record? All of these are legitimate concerns.

How do you handle such a case? Here's my advice.

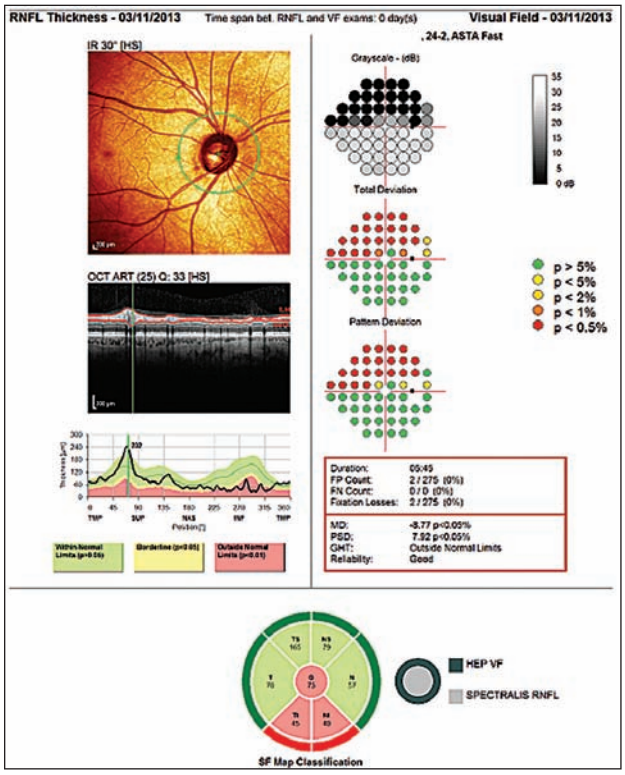
First, be cautious about making any significant changes right away to the patient's therapy or frequency of visits. For instance—although I had questions about the stability of this patient's right optic nerve—I didn't make any changes at the initial visit simply because, without his prior record, I had no documentation of his progress over the past few years. But I felt confident enough that, given the findings of the initial visit, there was no imminent threat to the optic nerve.

One exception to this rule is when you are firmly convinced that continuing the status quo would be detrimental to the patient. For example, if the patient has been seen only once a year, that is certainly something you need to change.

Also, realize that the patient's perceptions of his or her situation may not actually reflect the severity of the situation. This patient mentioned that his previous provider implied that he had early glaucoma. That may have been what the doctor actually said—or it may have been his interpretation of what the doctor said. My take on the situation was that this was not early glaucoma, at least in the right eye.

So, we have to look to objective test results to tell us where the patient has been, and where he is possibly heading. (And that is the reason prior records are important in continuing the care of glaucoma patients.)

In a perfect world, objective tests should yield the same results on the same eye if nothing has changed. But the reality is, at least in objective testing of glaucoma, we have many different instruments available to us, produced by different manufacturers, which can look at the same optic nerve and "image" different things, and so produce different results.



This patient's optic nerve head photographs did not correspond with his objective test results, which showed thinning of the neuroretinal rim and corresponding field loss.

In this case, for instance, my intern noted that the ONH photo OD did not match the HRT-3 and Spectralis OCT's grading of the optic nerve OD. Obviously, we're comparing apples to oranges here, but the patient's right neuroretinal rim certainly appeared more robust in the optic nerve photos. So, in looking at just one imaging technology compared to another, the results can and sometimes do look different, even when assessing the same nerve.[1]

Not surprisingly, this causes us to rely heavily on our own physical assessment of the optic nerve, and characterize that optic nerve based upon our experience.

Technology can play a tremendous role in helping us to determine stability over time, which is essential to successful glaucoma management. Objectivity aside, keep in mind that one instrument may flag an optic nerve as "abnormal" whereas another objective instrument may flag the same optic nerve as "normal."

But just how do we define what actually is (and isn't) the optic nerve? I'll address that question in a future column. ■

1. Yang B, Ye C, Yu M, et al. Optic disc imaging with spectral-domain optical coherence tomography: variability and agreement study with Heidelberg retinal tomograph. Ophthalmology. 2012 Sep;119(9):1852-7.

One Day of Symptoms

This patient presented with blurred vision and a headache that had persisted for 24 hours. Considering the retinal findings, what's her diagnosis? **By Mark T. Dunbar, OD**

A 42-year-old Hispanic female presented with blurred vision and distortion in both eyes (OS > OD) that persisted for the last 24 hours. She said that her symptoms had started the day before, and were accompanied by a headache. Further, she reported that, "straight lines appeared curved." The patient said that her headache was better today, but that her vision had not improved.

Her ocular history was significant for successful soft contact lens wear for the past 24 years. Her medical history was noncontributory. She reported being healthy, and was taking no medications.

On examination, her visual acuity measured 20/25 OD and 20/40 OS. Extraocular motility testing was normal. Confrontation fields were full to careful finger counting OU. Amsler grid testing showed central metamorphopsia involving fixation in both eyes. Her pupils were equally round and reactive, with no evidence of afferent defect. Slit lamp evaluation was significant for trace anterior chamber cells. Her intraocular pressure measured 16mm Hg OU.

On dilated fundus examination, we noted 1+ vitreous cells OU. Optic nerve evaluation showed small cups with good rim coloration and perfusion. We documented significant changes in both maculae and posterior poles (*figures 1 and 2*).

Additionally, we obtained a fluorescein angiogram (FA) (*figures 3 and 4*) and an SD-OCT scan (*figures 5 and 6*).

Take the Retina Quiz

1. What do the changes seen in the maculae and posterior poles represent?

a. Placoid lesions at the level of the retinal pigment epithelium (RPE).

b. Choroidal infarcts.

c. Combined choroidal detachment and retinal detachment.

d. Multiple exudative retinal detachments.

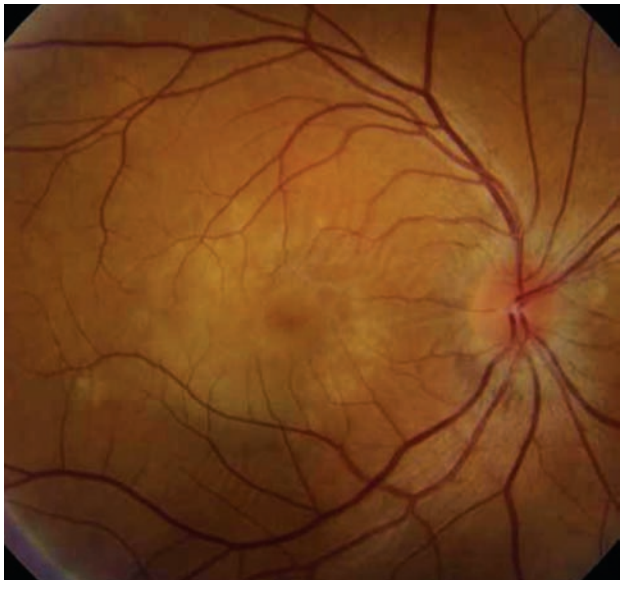
2. What fairly evident clincal findings do the FA and SD-OCT scans reveal?

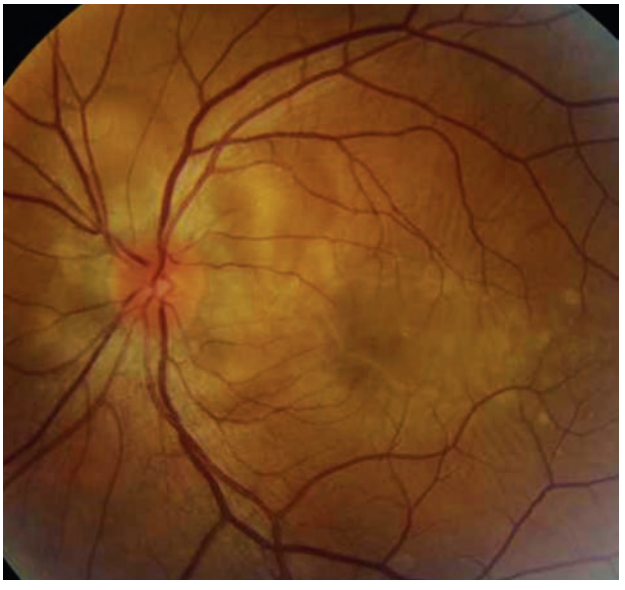
a. Multiple retinal and RPE detachments.

b. Choroidal detachments.

c. Subretinal mass.

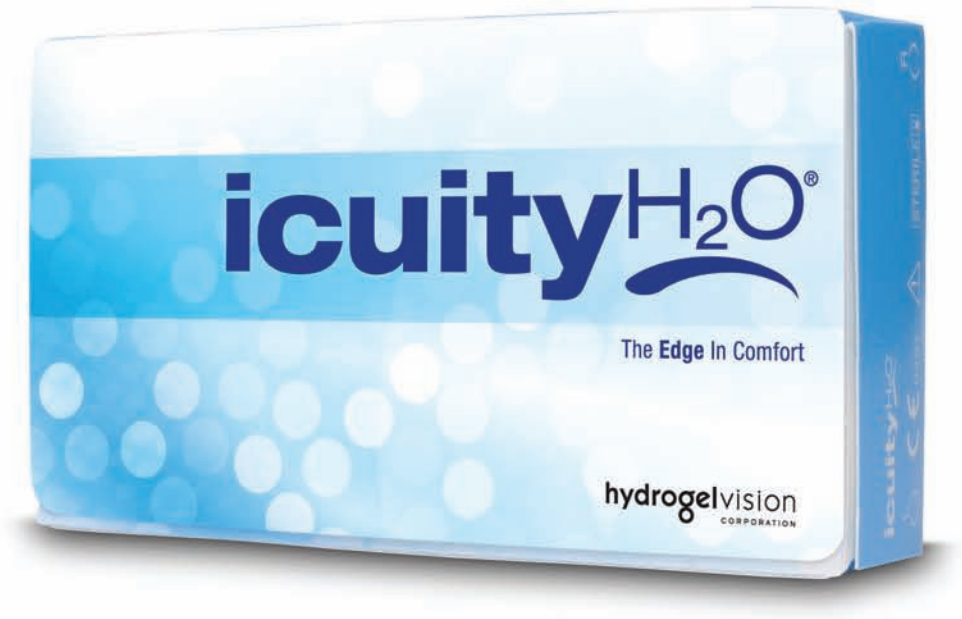
d. Hemorrhagic detachment of the RPE.





1, 2. Color fundus photographs show obvious retinal changes in the posterior poles and maculae (OD left, OS right).

think weekly.



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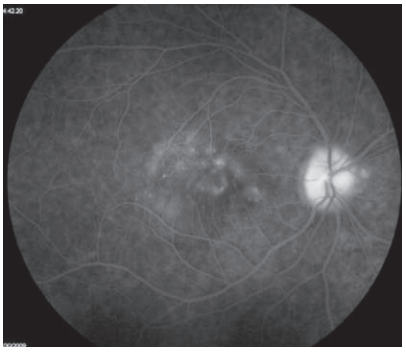
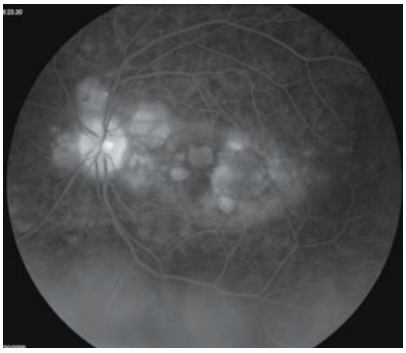



3, 4. Two late-phase FA images show more obvious findings (OD left, OS right).

3. What is the correct diagnosis?
a. Acute multifocal pigment placoid epitheliopathy.
b. Ocular sarcoidosis.
c. Vogt-Koyanagi-Harada (VKH) disease.
d. Bilateral central serous retinopathy.

4. How should this patient be managed?
a. Observation.
b. Laser photocoagulation.
c. Intravitreal Avastin (bevacizumab, Genentech/Roche) injection.
d. High-dose steroids.

Discussion

It was clear that our patient had serous fluid located in the posterior poles of both eyes. Far less obvious, however, was determining if the fluid represented serous retinal or serous RPE detachments. Both the fluorescein angiogram and the SD-OCT helped us understand the clinical and anatomical changes.

On SD-OCT, we saw that both serous retinal and serous RPE detachments were present in each eye. (The left eye exhibited more fluid and much clearer delineations between the retinal and RPE detachments.) Additionally, the SD-OCT scan revealed localized areas of cystoid macular edema in the right eye.

Although the SD-OCT provided good anatomic perspective, it was the late phases of the FA scan that showed a broader view of our patient's condition. The delineation of numerous RPE detachments stood out within the mass of diffuse staining throughout the posterior pole and optic nerve.

So, what do these findings represent? Considering her headache the day before, as well as the presence of vitreous cells and numerous exudative retinal detachments in both eyes, it appeared that our patient had VKH disease.

The hallmark finding in patients with VKH disease is bilateral granulomatous uveitis associated with exudative retinal detachments. Several extraocular manifestations also can be present—the most common being cerebrospinal fluid pleocytosis. Other secondary findings include vitiligo, poliosis, alopecia and dysacusis.[1] We saw none of those conditions in our patient.

The clinical course of VKH typically follows a pattern that begins with a prodromal stage, in which patients often develop a viral-like illness that lasts three to five days. During this time, patients may have fever, malaise, headaches, dizziness, orbital pain and nausea. Interestingly, with the exception of a headache, our patient did not experience any such symptoms.

Following the prodromal stage, patients move into the uveitic stage. Here, patients typically develop blurred vision (due to exudative retinal detachments), as well as granulomatous inflammation that includes posterior choroid thickening, optic nerve edema, and inflammation of the ciliary body and choroid.

The inflammation also can extend to include anterior chamber cell and flare. We performed an ultrasound on our patient and, indeed, she exhibited posterior choroid thickening.

Next, VKH progresses to the chronic stage, in which patients develop choroid depigmentation. This anatomic change has been referred to as the "setting sun" sign, because the choroid and RPE assume reddish hue that is similar to the color of a beautiful sunset. In this stage, patients also may develop vitiligio and poliosis.

Finally, the chronic recurrent stage of VKH consists of a smoldering panuveitis in which the patient can develop recurrent episodes of granulomatous anterior and posterior uveitis.[1]

The diagnosis of VKH typically is based on clinical findings. There is some debate on the necessity of ancillary testing, such as lumbar puncture. In cases where the presentation is straightforward, such testing may not be necessary. However, if the diagnosis is in question, a lumbar puncture may indicate cerebrospinal fluid pleocytosis.

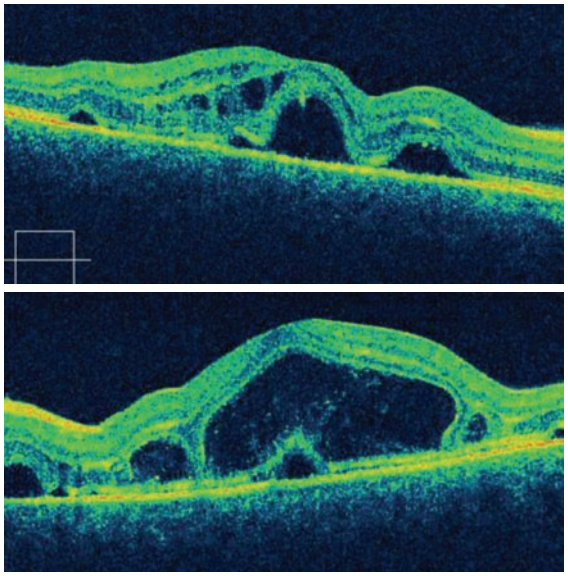
Additionally, human leukocyte antigen (HLA) testing may be useful, depending upon the patient's ethnicity. For example, VKH is more common in Japanese patients, accounting for 6.8% to 9.2% of all uveitic cases.[2] It is also more prevalent in Hispanics, Native Americans and Indians than in whites.

HLA-DR4 testing has been shown to be highly specific in Japanese and Korean patients with VKH. Interestingly, HLA-DR4 and subtype HLA-DR1 were detected in 89% of Mexican mestizo patients living in Southern California who were diagnosed with VKH.[1,3] Our patient did not have HLA testing, because the diagnosis was fairly uncomplicated.

The mainstay of treatment is early and aggressive systemic corticosteroid therapy (80mg to 100mg oral prednisone per day), followed by a slow taper over a six-month duration. Alternatively, intravenous methylprednisolone can be administrated for three days, followed by a slow taper of oral prednisone.[1]

Most VKH patients respond very well to corticosteroid therapy, with rapid symptom improvement that includes complete resolution of the exudative retinal detachments and a restoration of visual function.

We started our patient on 80mg of oral prednisone. Over the course of one month, the fluid resolved and her visual acuity returned to 20/20 OU. We followed her over the next four years, and she experienced no recurrence. ■



5, 6. The SD-OCT scan shows vertical cuts through both maculae (OD top, OS bottom).

1. Rao PK, Rao NA. Vogt-Koyanagi-Harada Disease. In: Ryan SJ (ed.). Retina: Vol. II—Medical Retina, 4th ed. St. Louis: Mosby; 2006:1827-37.
2. Moorthy RS, Inomata H, Rao NA. Vogt-Koyanagi-Harada syndrome. Surv Ophthalmol. 1995 Jan-Feb;39(4):265-92.
3. Arellanes Garcia L, Bautista N, Mora P, et al. HLA-DR is strongly associated with Vogt-Koyanagi-Harada Disease in Mexican Mestizo patients. Ocul Immunol Inflamm. 1998 Jun;6(2):93-100.

Patient Has Two Golden Globes

This middle-aged male presented with yellowed, irritated eyes. How should he be managed? **By Alan G. Kabat, OD, and Joseph W. Sowka, OD**

A 48-year-old white male presented for acute care, complaining of bilateral ocular irritation, blurry near vision and "yellow eyes." He reported several prior years of alcohol and drug abuse—although he claimed that he was sober for the past four months. His medical history was reportedly unremarkable, but he admitted that he had not been to a physician in more than 10 years.

Upon examination, his corrected visual acuity was 20/20 OD and OS at distance and near. Slit lamp evaluation revealed notable bulbar hyperemia OU, with a distinct yellow hue in the conjunctival tissue. Otherwise, he exhibited clear corneas, normal intraocular pressure and unremarkable posterior segment structures OU. Upon further questioning, the patient denied any history of recent ocular trauma.

Conjunctival Icterus

The clinical finding of "yellow eyes" is relatively uncommon. The proper medical term for this condition is surprisingly not jaundice, but rather icterus. Both terms denote a discoloration of the skin or mucous membranes associated with excess bilirubin. But, while jaundice is indicative of multi-tissue involvement, icterus is defined as yellowing of a specific entity—such as the eye. Thus, a patient with icterus may subsequently be reclassified as being jaundiced upon further evaluation.

Historically, this ocular phenomenon has been described as scleral icterus—although there is evidence that the pigment deposition actually occurs in the overlying conjunctiva, rather than in the sclera.[1] Hence, the term conjunctival icterus is preferred today.[2,3]

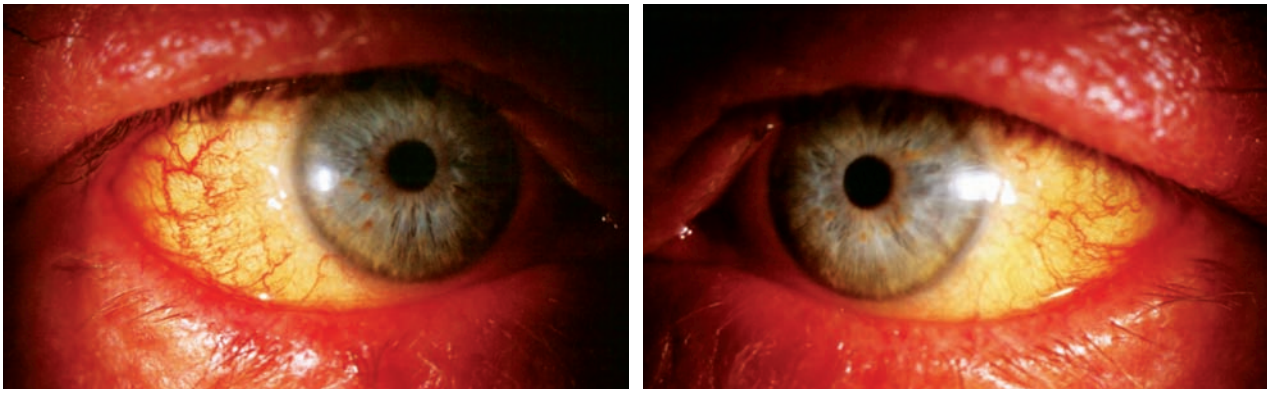
Associated Conditions

Numerous ocular and systemic conditions may be linked to conjunctival icterus:

- ***Subconjunctival hemorrhage*** is one of the more clinically significant causes of icterus. In this instance, as the blood pigment (heme) undergoes normal catabolism, bilirubin is produced—yielding the familiar yellow coloration that is also evident in bruises, bile and urine.[4]
- ***Hyperbilirubinemia***, or increased levels of serum bilirubin, is more commonly associated with icterus than subconjunctival hemorrhage. Hence, the finding of conjunctival icterus—particularly when it is bilateral in nature—presents a diagnostic dilemma with a host of potential systemic implications.

Identifying the correct underlying etiology involves appropriate laboratory and physical testing.[5,6] Bilirubin is produced throughout the body, but is metabolized in the liver and excreted via the bile ducts into the small intestine.

Hepatic and biliary disorders are highly correlated with hyperbilirubinemia, and therefore, liver function tests must be a primary



Our patient presented with bilateral bulbar hyperemia and notable conjunctival yellowing (OD left, OS right).

consideration in patient management (*see "Common Liver Panel/Liver Function Tests," right)*.

Elevated serum bilirubin levels will help confirm the clinician's suspicions, and may point toward an initial diagnosis of hepatitis, alcoholic cirrhosis, hemolytic anemia or systemic infections, such as leptospirosis. Abnormal alanine aminotransferase (ALT) or aspartate aminotransferase (AST) levels are suggestive of liver toxicity due to drugs or other toxic substances, chronic hepatitis, obstruction of bile ducts or cirrhosis. Very high ALT and AST levels are indicative of acute viral hepatitis. The AST/ALT ratio can be helpful in distinguishing between the various aforementioned conditions.

Abnormal alkaline phosphatase levels are characteristic of biliary obstruction and may occur as a possible result of bile duct cysts, gallstones or tumors, or pancreatic tumors. Serum albumin is also helpful in diagnosing liver and renal disease; low levels correlate with cirrhosis and nephritic syndrome, while high levels are associated with chronic dehydration.

• ***Leptospirosis***, a rare and severe infection that occurs from contact with bacteria of the *Leptospira* genus, is another important consideration in cases of conjunctival icterus. Generally, the bacteria is encountered only in warm climates, and is associated with exposure to water that has been contaminated by animal urine.[7]

Additional non-specific signs and symptoms of leptospirosis may include cough, sore throat, headache, muscle or abdominal pain, conjunctivitis, swollen lymph glands and enlargement of the spleen and/or liver (hepatosplenomegaly). Fortunately, leptospirosis can be managed with broad-spectrum antibiotics, such as azithromycin, ceftriaxone, doxycycline or penicillin.

Patients with abnormal signs, symptoms and laboratory results warrant referral to an internist for additional serology, including a complete blood count with differential, prothrombin time, hepatitis-specific antibodies, iron and ferritin levels.

Urinalysis can be helpful in further evaluation of albumin or total protein abnormalities. Ultimately, a liver biopsy may be required for a definitive diagnosis of specific entities, such as hepatitis A, alcoholic liver disease, tuberculosis and liver cancer.

In our patient, his long history of drug and alcohol abuse prompted a presumptive diagnosis of liver disease, with a differential of cirrhosis and hepatitis. Leptospirosis was also considered, because the patient admitted to residing in generally poor living conditions throughout his recent life. We referred him for appropriate blood work and scheduled a consultation with an internist. The results of his evaluation are still pending. ■

Common Liver Panel/Liver Function Tests[8]

• ***Bilirubin.*** There are two different bilirubin tests: total and direct. Direct bilirubin represents the conjugated form, which occurs after it has been processed by the liver. These tests are useful in cases of jaundice and, when used together, can help to isolate the lesion's location.

–Reference range: Total 0.3-1.9mg/dL; Direct 0.0-0.3mg/dL.

• ***Alanine aminotransferase (ALT).*** An enzyme mainly found in the liver, ALT is one of the best tests for detecting hepatitis.

–Reference range: 10-40IU/L.

• ***Aspartate aminotransferase (AST).*** This enzyme is not specific to the liver (e.g., it is also present in the heart and skeletal muscle), but its concentration may increase following acute liver damage. The AST to ALT ratio is sometimes useful in differentiating between causes of liver damage.

–Reference range: 10-34IU/L.

• ***Alkaline phosphatase (ALP).*** This enzyme often increases following bile duct obstruction.

–Reference range: 44-147IU/L.

• ***Albumin.*** The main protein produced by the liver, albumin levels decrease in patients with chronic liver disease (e.g., cirrhosis) or renal disorders (e.g., nephrotic syndrome).

–Reference range: 3.4-5.4g/dL.

• ***Total protein (TP).*** This measurement includes albumin as well as globulin. Low values may implicate liver disease or acute infection, while high concentrations are found in patients with paraproteinaemia, Hodgkin's lymphoma or leukemia.

–Reference range: 6.0-8.3g/dL.

1. Kuiper JJ. Conjunctival icterus. Ann Intern Med. 2001 Feb 20;134(4):345-6.
2. Beisel B. Use of the term conjunctival icterus instead of scleral icterus. Am Fam Physician. 2005 Jan 1;71(1):49.
3. Ng BJ, Alexander D, Robinson GM. Unilateral conjunctival icterus and no 'glass eye'. Intern Med J. 2012 Jun;42(6):735-6.
4. Stafanous SN, Matthew M. An unusual case of recurrent subconjunctival haemorrhage causing yellow-brown discolouration due to haemosiderin deposition. Orbit. 2009;28(2-3):179-80.
5. Giannini EG, Testa R, Savarino V. Liver enzyme alteration: a guide for clinicians. CMAJ. 2005 Feb 1;172(3):367-79.
6. Lee TH, Kim WR, Poterucha JJ. Evaluation of elevated liver enzymes. Clin Liver Dis. 2012 May;16(2):183-98.
7. Rathinam SR. Ocular manifestations of leptospirosis. J Postgrad Med. 2005 Jul-Sep;51(3):189-94.
8. National Institutes of Health. MedlinePlus. Available at: www.nlm.nih.gov/medlineplus/. Accessed March 28, 2013.

Don't Miss the Point

Point-of-care diagnostics can help increase clinical efficacy and prevent frequent follow-up visits. **By Paul M. Karpecki, OD, and Diana L. Shechtman, OD**

Point-of-care testing (POCT) allows clinicians to confirm a diagnosis and determine a management plan in a more timely fashion than offsite laboratory testing.[1] Common examples of POCT include pregnancy testing or blood glucose screening.

In eye care, two devices clearly fall under the guise of PCOT: AdenoPlus (Rapid Pathogen Screening, Inc./NicOx) for adenovirus detection and the TearLab Osmolarity System (TearLab Corporation) for dry eye evaluation. Here, we'll review how you can deliver enhanced patient care with these POCT-based diagnostic systems.

AdenoPlus

We've all heard about instances when entire clinics have been shut down because a bout of epidemic keratoconjunctivitis (EKC) affected its doctors and staff.[2] Without question, EKC is one of the most severe forms of conjunctivitis we face. The disease couse has a long duration—with an active infection persisting for seven days, followed by an immune response and the presence of subepithelial infiltrates for another six to seven days, concluding with five to seven additional days of morbidity.[2,3] In fact, research has shown that it could take as long as 24 weeks for an EKC patient to exhibit normal stromal characteristics.[3]

So, it is essential to make a prompt diagnosis and begin treatment immediately to decrease the infectious potential of EKC as well as limit its associated complications, such as decreased vision secondary to subepithelial infiltrative progression.[4,5] Because many signs and symptoms of viral conjunctivitis mimic those of bacterial conjunctivitis, making a diagnosis can be difficult. Further, misappropriated antibiotic treatment of a viral conjunctivitis not only will yield little therapeutic effect, but also increase the probability of localized resistance.

The AdenoPlus procedure involves touching a felt pad to the lower bulbar conjunctiva, which allows it to absorb tears. Then, the saturated pad is snapped into a cartridge. A liquid reagent subsequently is applied and absorbed into the system. After five to 10 minutes, the result will be available for review. A single line in the reading window indicates a negative result for adenovirus, whereas two lines support a positive adenovirus diagnosis.

When a patient initially presents with acute red eye, instruct your staff to take a history and then administer the AdenoPlus test. The results will be ready by the time you see the patient, which helps increase examination efficiency as well as enhance your patient's trust in your diagnosis. Look for pseudomembranes and other potential findings associated with EKC to complete the examination. Then, treat the patient with topical antivirals, such as Zirgan (ganciclovir ophthalmic gel, Bausch + Lomb) or a povidone iodine rinse.

TearLab

Another helpful POCT-based technology is the TearLab Osmolarity System. This device employs a single-use cartridge that houses a gold-plated microchip, a handpiece and a reader. By touching the edge of the tears at the temporal aspect of the lower eyelid, the device measures osmolarity in seconds. You only need to collect a 50nL tear sample to test even the most severe Sjögren's syndrome patients.[6,7]

Tear film osmolarity demonstrates the least variability of all dry eye metrics and is a fundamental consideration in any dry eye disease workup.[8-12] Once a small sample of tears is collected, TearLab determines the osmolarity reading in milliosmoles per liter (mOsmol/L).

A reading between 300mOsmol/L and 320mOsmol/L is considered mild dry eye; 320mOsmol/L to 340mOsmol/L suggests moderate dry eye; and any finding greater than 340mOsmol/L is graded as severe dry eye.[9,11] If the difference between eyes is greater than 6mOsmol/L, and a reading greater than 300mOsmol/L is documented in at least one eye, the patient likely has dry eye disease. This is because the eyes of patients with dry eye constantly remain in flux, as one eye tries to compensate for the deficiencies of the other.[13]

The TearLab test has a positive predictive value of 87%, which is almost double that of any other commercially available dry eye measurement—including tear film break-up time, Schirmer testing or subjective patient questionnaires.[11] Additionally, TearLab testing is reimbursed by CMS at approximately $43 per patient.

The Future of PCOT

Although PCOT is highly valuable to clinical diagnosis and management, AdenoPlus and TearLab are just the beginning. Companies are developing POCT devices that may identify Alzheimer's plaques in the crystalline lens years or even decades before they appear in the brain.[14] Other devices that screen for allergic conjunctivitis via IgE testing or inflammatory eye disease via MMP marker detection are being developed as well.[15,16] And, in the near future, we may gain access to POCT testing devices that detect and evaluate systemic biomarkers for diabetic eye disease in a patient's tears.[17]

With the addition of PCOT devices in clinical practice, optometrists will be able to play an increased role in providing both primary eye care and medical care to their patients. In turn, PCOT will further enhance patients' confidence in your diagnostic capabilities. ■

Dr. Karpecki is a paid consultant to NicOx and Bausch + Lomb. He also serves on the board of directors and clinical advisory board for TearLab.

1. Hovis JK, Ramaswamy S. The effect of test distance on the CN lantern results. Vis Neurosci. 2006 May-Aug;23(3-4):675-9.
2. Jernigan JA, Lowry BS, Hayden FG, et al. Adenovirus type 8 epidemic keratoconjunctivitis in an eye clinic: risk factors and control. J Infect Dis. 1993 Jun;167(6):1307-13.
3. Dosso AA, Rungger-Brandle E. Clinical course of epidemic keratoconjunctivitis: evaluation by in vivo confocal microscopy. Cornea. 2008 Apr;27(3):263-8.
4. Kaufman HE, Haw WH. Ganciclovir ophthalmic gel 0.15%: safety and efficacy of a new treatment for herpes simplex keratitis. Curr Eye Res. 2012 Jul;37(7):654-60.
5. Trinauarat A, Atchaneeyasakul LO. Treatment of epidemic keratoconjunctivitis with 2% povidone-iodine: a pilot study. J Ocul Pharmacol Ther. 2012 Feb;28(1):53-8.
6. Bunya VY, Langelier N, Chen S. Tear Osmolarity in Sjögren Syndrome. Cornea. 2013 Feb 12. [Epub ahead of print]
7. Lemp MA, Foulks GN, Pepose JS. Evaluation of tear osmolarity in non-Sjögren and Sjögren Syndrome dry eye patients with the TearLab system. Cornea. 2013 Mar;32(3):379-81.
8. Versura P, Campos EC. TearLab Osmolarity System for diagnosing dry eye. Expert Rev Mol Diagn. 2013 Mar;13(2):119-29.
9. Sullivan BD, Crews LA, Sonmez B, et al. Clinical utility of objective tests for dry eye disease: variability over time and implications for clinical trials and disease management. Cornea. 2012 Sep;31(9):1000-8.
10. Eperiesi F, Auila M, Bartlett H, et al. Reproducibility and repeatability of the OcuSense TearLab osmometer. Graefes Arch Clin Exp Ophthalmol. 2012 Aug;250(8):1201-5.
11. Sullivan BD, Whitmer D, Nichols KK, et al. An objective approach to dry eye disease severity. Invest Ophthalmol Vis Sci. 2010 Dec;51(12):6125-30.
12. The definition and classification of dry eye disease: Report of the Definition and Classification Subcommittee of the International Dry Eye WorkShop (2007). Ocul Surf. 2007 Apr;5(2):75-92.
13. Gaffney EA, Tiffany JM, Yokoi N et al. A mass and solute balance model for tear volume and osmolarity in the normal and the dry eye. Prog Retin Eye Res. 2010 Jan;29(1):59-78.
14. Ecroyd H, Carver JA. Crystallin proteins and amyloid fibrils. Cell Mol Life Sci. 2009 Jan;66(1):62-81.
15. Doan S, Belayachi N, Ren L. Tear IgE level measurement using semiquantitative methods in children with vernal keratoconjunctivitis (VKC). Available at: http://abstracts.iovs.org/cgi/content/abstract/43/12/114. Accessed April 4, 2013.
16. Rapid Pathogen Screening, Inc. RPS InflammaDry Detector. Available at: www.rpsdetectors.com/in/wp-content/uploads/2012/07/FORM-MKT-003.1-RPS-InflammaDry-Detector-Sell-Sheet.pdf. Accessed April 4, 2013.
17. Csosz E, Boross P, Csutak A, et al. Quantitative analysis of proteins in the tear fluid of patients with diabetic retinopathy. J Proteomics. 2012 Apr 3;75(7):2196-204.

Lenses

Essilor Definity Progressive Lenses

Essilor is introducing several new initiatives to promote its Definity progressive lenses this spring. For one, Definity 3 and Definity 3 Plus lenses are now available in a wide spectrum of indexes and materials, including standard plastic 1.50, Trexa Trivex-based material, Airwear polycarbonate, Thin&Lite 1.67 and Thin&Lite 1.74.

The m'eyeFit digital measuring system provides a high-tech method to ensure accurate fit of Definity lenses.

For another, the affiliation between Definity lenses and the m'eyeFit digital measuring system offers eye care professionals a high-tech method to ensure accurate fit while providing flexibility in the dispensing process. This electronic tabletop dispensing device precisely measures pupillary distance, fitting height, A & B, pantoscopic tilt, wrap and vertex measurements. It comes preloaded with additional tools to make dispensing easier, including frame selection, patient education, patient information management, online ordering and PMS connection, the company says.

In addition, the redesigned website for Definity lenses gives members access to more content and exclusive rewards, and an enhanced experience through a new partnership with The Power Practice, a practice-building consultation service. Through a free, one-on-one *Power Profitability Analysis* with Gary Gerber, OD, eye care professionals will learn ways to improve profitability in their businesses.

Visit www.definitycommunity.com.

Unity BluTech Lenses

Designed to protect the eyes from harmful, high-energy blue light, the newly launched Unity BluTech lenses from VSP Optics Group are infused with natural melanin and ocular lens pigments. These impact-resistant lenses filter out harmful, high-energy blue light and UVA/UVB radiation while allowing innocuous light to pass though.

They also enhance contrast and visual acuity, reduce glare and

Disposable Prisms

Tonosafe

Unlike reusable prisms, Haag-Streit's disposable Tonosafe prism eliminates the need to clean and disinfect prisms between IOL measurements, check for prism damage or monitor prism age. Thus, it reduces the risk of corneal damage and cross-infection between patients, the company says.

Designed for all Goldmann and Perkins contact tonometers, Tonosafe delivers Goldmann accuracy while simplifying the IOP measurement process. Each package contains the disposable prism and a prism holder for quick and easy replacement.

Visit www.haag-streit-usa.com to request a free sample box. Choose "tonometers" on the left, then click "Tonosafe disposable tonometer prism" to access the request form.

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improve night vision, the company says.

The BluTech technology is available in both indoor and outdoor lenses for most of VSP's Unity digital single vision and progressive lenses. The indoor lenses feature a slight tint and the outdoor lenses are polarized with 80% light absorption.
Visit www.vspopticsgroup.com.

Portable Video Centration System

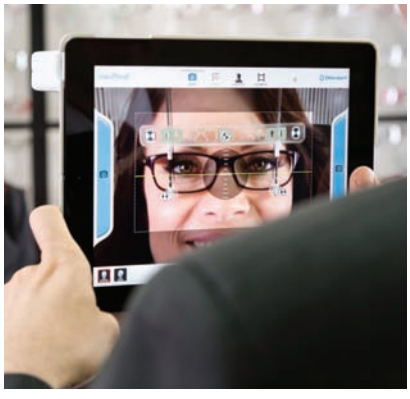
visuReal

Combining the convenience of a tablet with cloud computing power, AIT Industries recently unveiled its new video centration system—the visuReal Portable.

To determine all required centration values, it uses a specialized optical system attached to an iPad and a calibration tool that sits on the patient's frames. Measurements include:

- Pupillary distance
- Fitting heights
- Boxing dimensions
- Head rotation
- Inclination
- Vertex distance

You can easily email or store the measurements online. The company says that visuReal also allows you to upload photos and videos of patients wearing the trial frames to help them decide on the right look or get opinions from family and friends.



Visit www.aitindustries.com.

Website and Multimedia

Vmax Vision

With the launch of a new website and eight training videos, Vmax Vision is providing doctors and patients more resources aimed to guide them in using the PSF Refractor and Encepsion lenses.

The company says it offers tips on how to achieve more accurate and reliable refraction results, maximize office efficiencies while relieving physical stress, and deliver the best vision possible with the PSF Refractor and the digitally personalized Encepsion Lenses.

The new training videos were created to assist users at different levels of experience and understanding—from the beginner to the veteran refractionist. Available at www.vmaxvision.com/videos, the training videos include instruction on basic refraction, nighttime refraction, how to find an add power, and how to avoid overminusing and accommodation, among others.

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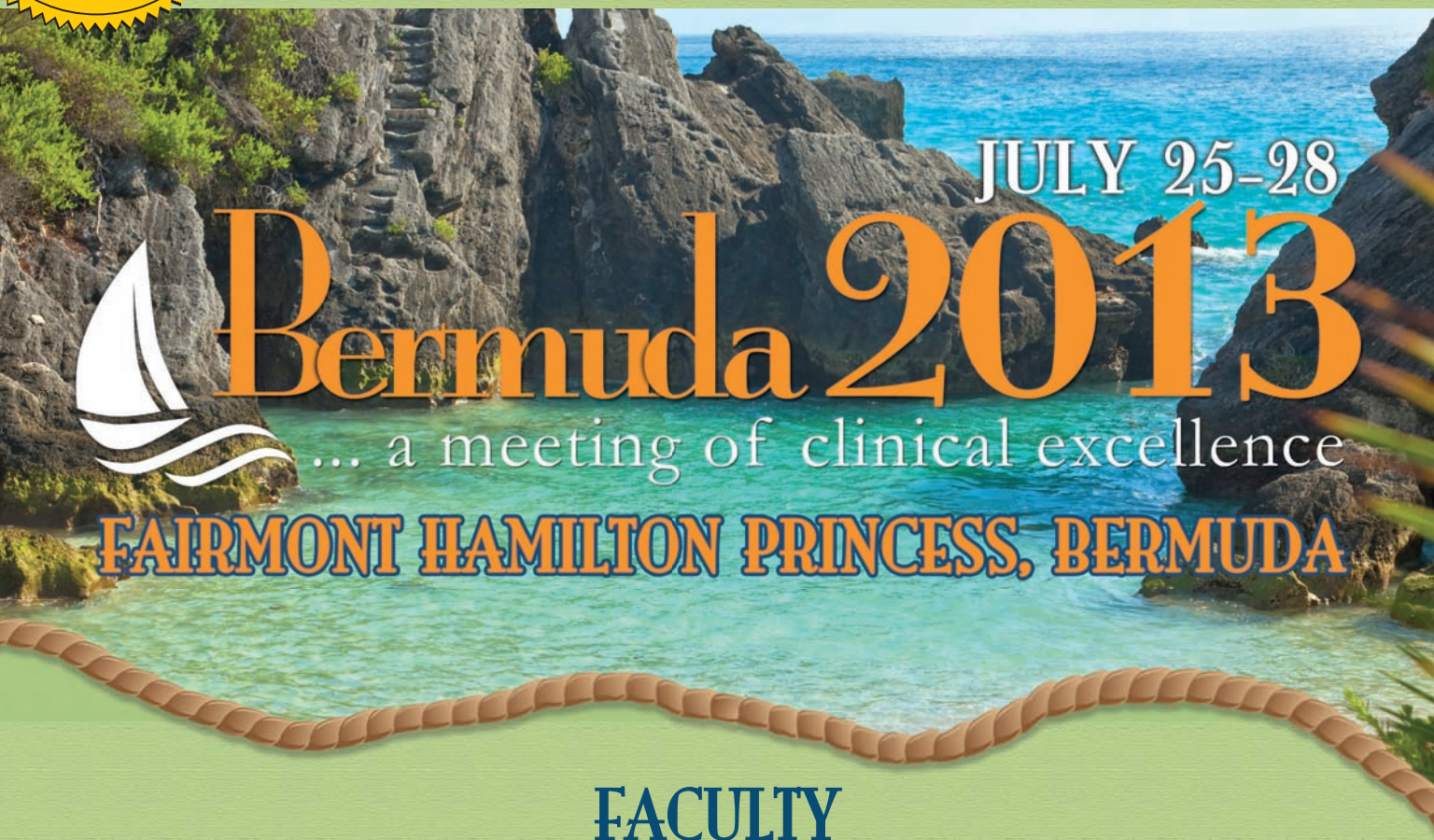

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Meetings + Conferences

April 2013

■ **24-28.** *11th Annual Education Conference.* Hilton Embassy Suites Kingston Plantation, Myrtle Beach, SC. Hosted by: New Jersey Chapter of the American Academy of Optometry. CE hours: 16. Featured speakers: Diana Shechtman, OD, and Carlo Pelino, OD. Contact Dennis H. Lyons, OD, at dhl2020@aol.com or (732) 920-0110.

■ **25-29.** *2013 ArOA Spring Convention.* The Peabody and Statehouse Convention Center, Little Rock, Ark. Hosted by: Arkansas Optometric Association. Contact Executive Director Vicki Farmer at aroa@arkansasoptometric.org or call (501) 661-7675. Visit www.arkansasoptometric.org.

■ **26-27, 29-30.** *CE in Italy: Venice* and/or *Bolzano and the Italian Dolomite Alps.* To register for one or both of these programs, contact James Fanelli, OD, at jamesfanelli@ceinitaly.com or call (910) 452-7225. Visit www.ceinitaly.com.

■ **26-28.** *28th Annual Morgan/Sarver Symposium.* DoubleTree Hotel, Berkeley Marina, Berkeley, Calif. Hosted by: University of California, Berkeley, School of Optometry. CE hours: 20. Email optoce@berkeley.edu or call (800) 827-2163. Visit http://optometry.berkeley.edu/ce/morgan-sarver-symposium.

■ **27-28.** *18th Annual Miami Nice Symposium 2013.* Westin Colonnade Hotel, Coral Gables, Fla. Hosted by: Miami-Dade Optometric Physicians Association. CE hours: 17. Email mdopa.board@gmail.com or call Dr. Steve Morris at (305) 668-7700. Visit www.miamieyes.org.

May 2013

■ **1-4.** *2013 Annual Educational Conference & Exposition.* Hilton Garden Inn, Missoula, Mont. Hosted by: Montana Optometric Association. Contact Executive Director Sue Weingartner at sweingartner@rmsmanagement.com or (406) 443-1160. Visit www.mteyes.com.

■ **2-4.** *MWCO Annual Congress.* Caesar's Palace, Las Vegas. Hosted by: Mountain West Council of Optometrists. Contact Tracy Abel, CMP, at tracyabel@earthlink.net or call (888) 376-6926. Visit www.mwco.org.

■ **3-4.** *High Performance Vision–Sports Vision Consulting Weekend.* Manhattan Beach Marriott, Manhattan Beach, Calif. CE hours: 16 Contact Don Tieg, OD, at doc7ct@snet.net or (203) 312-3123. Visit www.ultimateeventsllc.com.

■ **5-9.** *ARVO 2013.* Washington State Convention Center, Seattle, Wash. Hosted by: Association for Research in Vision and Ophthalmology. Email arvo@arvo.org or visit www.arvo.org.

■ **9-10.** *117th Annual Meeting and Spring Seminar.* DeVos Place, Grand Rapids, Mich. Hosted by: Michigan Optometric Association. Contact Amy Possavino at amy@themoa.org or call (517) 482-0616. Visit www.themoa.org.

■ **11-18.** *AEA Optometric Cruise Seminar.* Alaska-Inside Passage–Aboard the Star Princess. Itinerary: Seattle, Juneau, Skagway, Glacier Bay National Park, Ketchikan, Victoria, Seattle. Email aeacruises@aol.com or call (888) 638-6009. Visit www.optometriccruiseseminars.com.

■ **17-19.** *2013 AZOA Spring Congress.* Hilton Tucson El Conquistador Golf & Tennis Resort, Tucson, Ariz. Hosted by: Arizona Optometric Association. Contact Kate Diedrickson, at kate@azoa.org or call (602) 279-0055. Visit www.azoa.org.

■ **17-19.** *Nova Southeastern University's 17th Annual Eye Care Conference & Alumni Reunion.* NSU College of Optometry, Fort Lauderdale, Fla. Contact Vanessa McDonald at oceaa@nova.edu or visit http://optometry.nova.edu/ce.

■ **May 31-June 1.** *East Coast Optometric Glaucoma Symposium.* DoubleTree by Hilton Bethesda, Md. Hosted by: *Review of Optometry*. Meeting chair: Murray Fingeret, OD. CE hours: 12. Contact Lois DiDomenico at ReviewMeetings@Jobson.com or (866) 658-1772. Visit www.revoptom.com/conferences.

June 2013

■ **7-9.** *Ocular Symposium: Pearls in Ocular Diagnosis.* Holiday Inn Golden Gateway, San Francisco. CE hours: 24. Contact Lorraine Geary at ocularsymp@aol.com or call (415) 278-9940.

■ **13-16.** *Maui 2013.* Wailea Beach Marriott Resort & Spa, Maui, Hawaii. Hosted by: *Review of Optometry*. Meeting chair: Paul Karpecki, OD. CE hours: 14. Contact Lois DiDomenico at ReviewMeetings@Jobson.com or (866) 658-1772. Visit www.revoptom.com/conferences.

■ **26-30.** *Optometry's Meeting.* San Diego Convention Center, San Diego. Hosted by: American Optometric Association and American Optometric Student Association. To register, call (866) 229-3691 or visit www.optometrysmeeting.org.

July 2013

■ **1-5.** *CE in Belize 2013.* Belize Yacht Club Resort & Marina, Ambergris Caye, Belize. Hosted by: International Academy of Optometry. Meeting chair: Edward Paul, OD, PhD. CE hours: 16. Contact Elizabeth Cramond at elizabeth.landfalleye@gmail.com or (910) 256-6364. visit www.CEinBelize.com.

■ **10-14.** *45th Annual NOA Convention.* Loews New Orleans Hotel, New Orleans, La. Hosted by: National Optometric Association. Visit www.nationaloptometricassociation.com or call (877) 394-2020.

■ **25-27.** *Northern Rockies Optometric Conference.* Snow King Resort and Conference Pavilion, Jackson Hole, Wyo. Featured speakers: Jerry Sherman, OD, Jack Schaeffer, OD, Jay Henry, OD, Philip Gross, OD, and Stuart Richer, OD. Email director@nrocmeeting.com or visit www.nrocmeeting.com.

■ **25-28.** *Bermuda 2013.* Fairmont Hamilton Princess, Bermuda. Hosted by: *Review of Optometry*. Meeting chair: Paul Karpecki, OD. CE hours: 14. Contact Lois DiDomenico at ReviewMeetings@Jobson.com or (866) 658-1772. Visit www.revoptom.com/conferences.

■ **26-27.** 2013 *Gold Coast Summer Conference.* Hilton

Sandestin Resort, Destin, Fla. Sponsored by: Alabama Optometric Association and UAB School of Optometry Alumni Association. Visit www.alaopt.org.

August 2013

■ **1-4.** *2013 Annual Continuing Education Conference.* Wedgewood Resort, Fairbanks, Alaska. Hosted by: Alaska Optometric Association. Email akoa@alaska.com or call (907) 770-3777. Visit www.akoa.org.

■ **3-4.** *Colorado Vision Summit.* Crowne Plaza Hotel Denver International Airport, Denver, Colo. Hosted by: Colorado Optometric Association. Visit www.coloradovisionsummit.org or call (303) 863-9778.

■ **3-5.** *Annual Educational Retreat 2013.* South Seas Island Resort, Sanibel, Fla. Hosted by: Southwest Florida Optometric Association Inc. CE hours: 14. Contact Brad Middaugh, OD, at swfoa@att.net or (239) 481-7799. Visit www.swfoa.com.

September 2013

■ **8-9.** *Northeast Optometric Congress.* Westford Regency Inn and Conference Center, Westford, Mass. Email Kathleen Prucnal, OD, at drkaprucnal@msn.com or visit www.oepf.org.

■ **19-21.** *Envision Conference.* Hyatt Regency Minneapolis, Minneapolis, Minn. Email info@envisionconference.org or call (316) 440-1530. Visit www.envisionconference.org.

■ **20-22.** *New Technology & Treatments West Coast 2013.* Marriott Del Mar, San Diego. Hosted by: *Review of Optometry.* Contact Lois DiDomenico at ReviewMeetings@Jobson.com or (866) 658-1772. Visit www.revoptom.com/conferences.

■ **22.** *CE Forum XVII.* The Hotel Hershey, Hershey, Pa. Hosted by: Central Pennsylvania Optometric Society. CE hours: 6. Email Mary Good, OD, at cposrsvp@gmail.com.

October 2013

■ **2-5.** *International Vision Expo & Conference West 2013.* Sands Expo & Convention Center, Las Vegas. Call (800) 811-7151 or visit www.visionexpowest.com.

■ **6-7.** *SECO London 2013.* Hosted by: SECO International and the Association of Optometrists. CE hours: 12. Visit www.secointernational.com/london-2013.html.

■ **8-12.** *COVD 43rd Annual Meeting.* Rosen Shingle Creek, Orlando, Fla. Hosted by: College of Optometrists in Vision Development. Visit www.covd.org or call (330) 995-0718. ■

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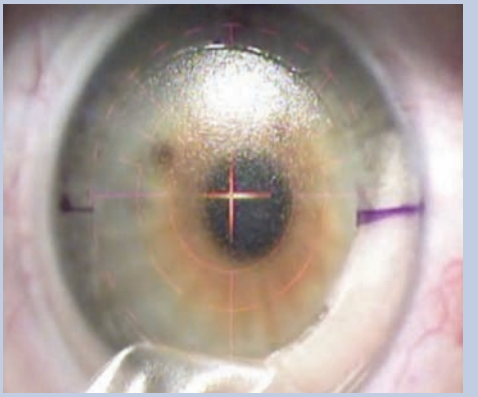
Back to the Basics of LASIK

Most outcomes are exemplary, but we must remain alert for complications.

By Derek N. Cunningham, OD, and Walter O. Whitley, OD, MBA



Go to www.revoptom.com or scan the QR code at left to see video footage of the procedure.

On The Web ›› View a narrated video of a LASIK procedure.

Though less popular today than in its mid-1990s heyday, LASIK continues to be one of the most common ocular surgeries that optometrists comanage. In the past decade, it has become faster, safer and more accurate. The technology jump has been significant, from mechanical blades to laser-created flaps and from basic refractive correction to custom wavefront ablations that allow correction of the aberrations unique to each eye. This means the visual results of LASIK are often better than what glasses or contacts can achieve. Many patients who were historically turned away for high cylinder or thin corneas are considered acceptable candidates now.

With advanced technology and excellent results, we run the risk of becoming complacent about adverse events. We don't see continuing education courses on LASIK complications any more because it is hard to fill an hour with something so rare. However, as this is still the most common surgery many of us will see, it is important to be mindful of potential complications. Just last month, ASCRS informed its members that the delivery vehicles of certain topical drugs, when used intraoperatively, may become sequestered beneath the LASIK flap and remain unabsorbed, causing inflammation and delayed epithelial healing.

The most prevalent risk is dry eye. LASIK induces temporary dry eye in everyone. For the majority of healthy eyes, it is not a protracted issue. If patients have pre-existing dry eye, the post-op symptoms can be very bothersome and decrease vision. It is important to screen every LASIK candidate very closely for dry eye, and treat aggressively when encountered. If managed appropriately prior to surgery, most dry eye patients can still have successful outcomes.

Another major risk concerns corneal topography. Any highly abnormal topography should be considered suspicious and should be repeated. If the patient wears contact lenses, lens wear should be discontinued to allow the natural corneal shape to return.

Post-op complications are rare, but prompt action can save several lines of vision. The most immediate complication is a dislodged flap, which often occurs when the patient rubs their eye. If significant, the patient will notice decreased vision. You will see folds in the flap and a gutter around the edge. This needs to be referred back to the surgeon immediately for a flap refloat to ensure the best visual outcome.

Diffuse lamellar keratitis, although very rare, is still a possibility after LASIK. You will see a sandy/grainy inflammatory response in the flap interface within the first several days following surgery. The treatment for this continues to be high-frequency topical steroids and daily monitoring. If the patient loses a line of vision, they should be referred back to the surgeon for a flap relift and wash out.

The last major complication we worry about is infection (again, very rare). Because of the risk of an infection spreading through the flap interface, any suspected infectious keratitis should be referred back to the surgeon for treatment.

With the increased safety and efficacy of LASIK, ODs are more comfortable than ever recommending and comanaging the procedure. But be sure to remain vigilent for its key risks and complications. ■

Review Meetings 2013

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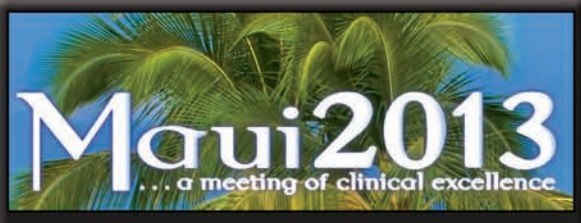

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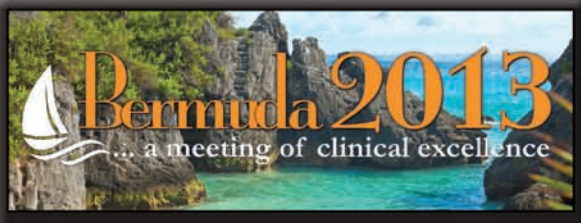

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REVIEW OF OPTOMETRY

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Diagnostic **Quiz**

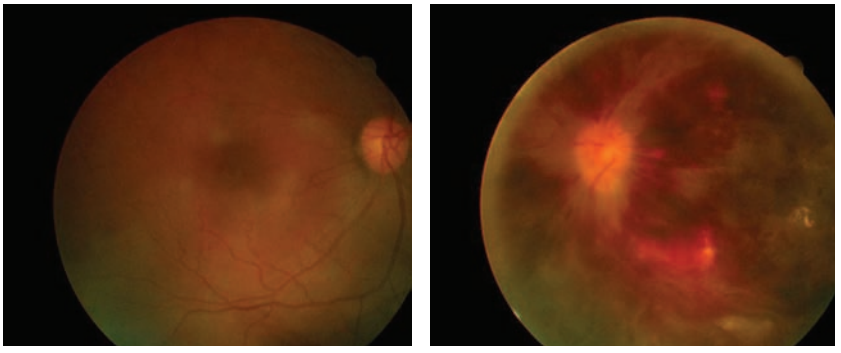
A History of Poor Systemic Health

By Andrew S. Gurwood, OD

History

A 45-year-old black male presented with a chief complaint of sudden visual decrease OU, which began two days earlier. His systemic history was remarkable for hyperlipidemia, hypertension and a 15-year history of type 2 diabetes mellitus.

Current medications included insulin, lisinopril and atorvastatin. He reported no known allergies of any kind.



Fundus images (OD left, OD right) of our 45-year-old patient who complained of sudden, bilateral vision loss two days earlier.

Diagnostic Data

His best-corrected visual acuity measured 20/100 OU, with no improvement upon pinhole testing. Extraocular muscle motilities were full and smooth, and his pupils exhibited no evidence of relative afferent defect.

Confrontational visual fields revealed intact peripheral vision OU. Ishihara color vision testing was unremarkable. Amsler grid testing revealed central metamorphosia OU. Slit lamp examination uncovered healthy anterior segment structures.

Intraocular pressure measured 21mm Hg OD and 20mm Hg OS. Additionally, his blood pressure was 192/94mm Hg.

Your Diagnosis

How would you approach this case? Does the patient require any additional tests? What is your diagnosis? How would you manage this patient? What is the likely prognosis?

To find out, please visit www.revoptom.com. Click on the cover icon for this month's issue, and then click "Diagnostic Quiz" under the table of contents. ■

Thanks to Jennifer Q. Duan, OD, of Manassas, Va., for contributing this case.

Retina Quiz Answers *(from page 82):* 1) d; 2) a; 3) c; 4) d.

Next Month in the Mag

Our May issue features the 14th Annual Report from ARVO, which will summarize the latest research in:

- *Retina*
- *Cataract and Refractive Surgery*
- *Glaucoma*
- *Cornea*

Also in May:

- *Lab Testing Dos and Don'ts* (earn 2 CE credits)

Feedback

Review of Optometry welcomes questions and comments. E-mail Jack Persico, editor-in-chief, jpersico@jobson.com, with "Letter to the Editor" as the subject line.

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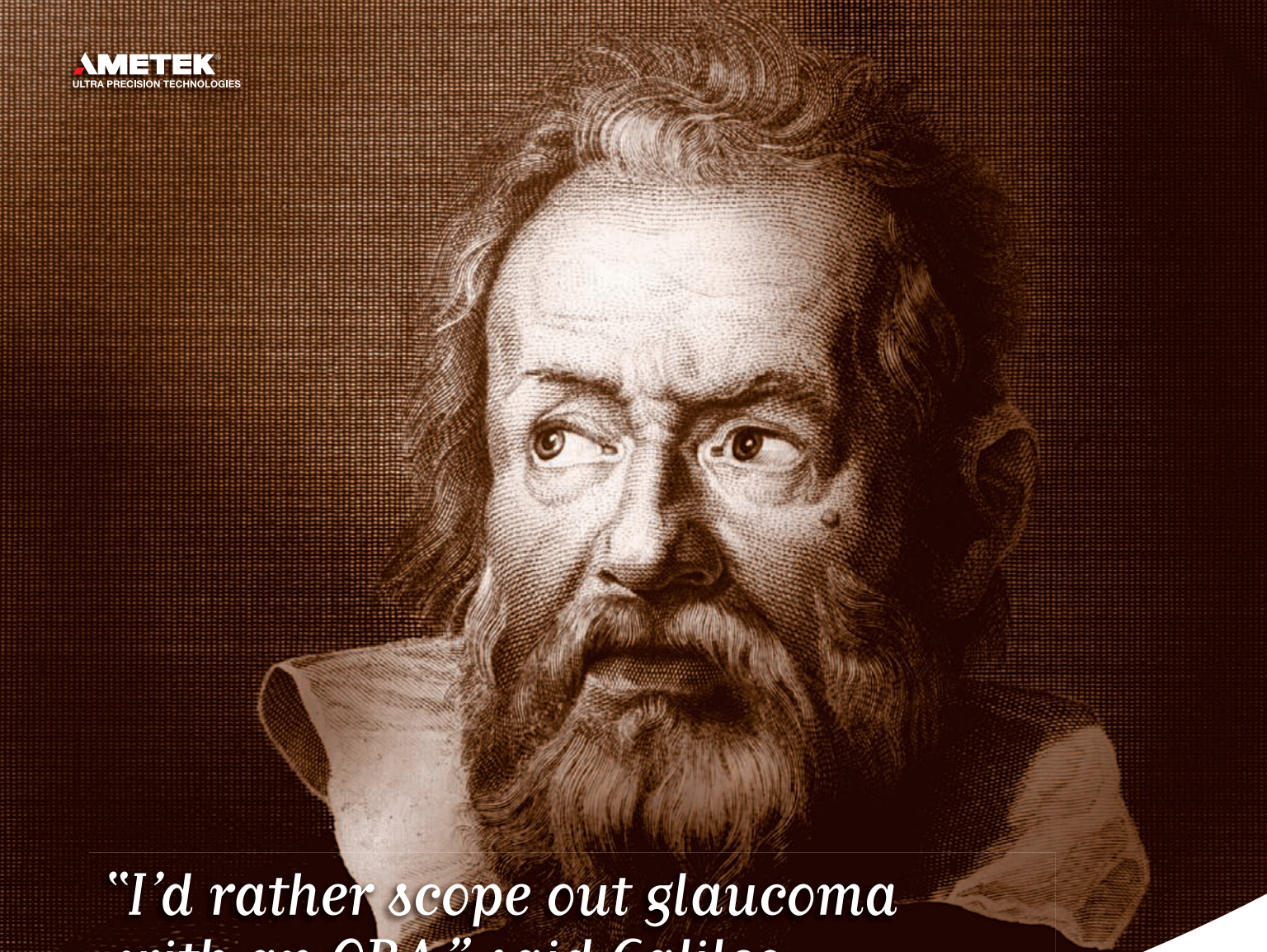
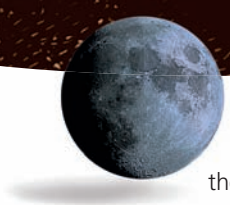
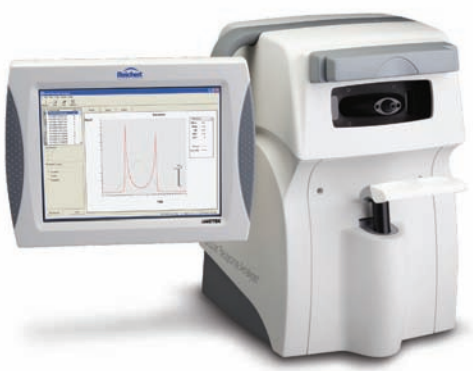


"I'd rather scope out glaucoma with an ORA," said Galileo.



Galileo understood the importance of having the right tool for the job. For glaucoma diagnosis and management, the new, state-of-the-art tool is Reichert's Ocular Response Analyzer® (ORA). Using a corneal hysteresis measurement, ORA assesses the cornea's biomechanical strength, and delivers a report in seconds. Then you'll have critical information you need to confidently treat – or not.

Learn more. Call 1.888.849.8955, or visit **www.reichert.com/ora**



The New Physics of Glaucoma.

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Alcon Can Help Bring Patients Back.

Alcon offers the DAILIES® family of daily disposable contact lenses and the AIR OPTIX® family of monthly replacement lenses. Multiple studies have shown that daily disposable and monthly replacement contact lens wearers are more compliant* than those who wear 2-week lenses.[2,3,4] Compliant patients also return for more eye examinations.[1]

Read more about this latest study, and see how Alcon can boost your practice, at myalcon.com/power-of-one

POWER OF ONE™

MORE POWER FOR GREATER SUCCESS

*Compliance with Manufacturer-Recommended Replacement Frequency (MRRF).

References: 1. Dumbleton KA, Richter D, Jones LW. Compliance with lens replacement and the interval between eye examinations. *Optom Vis Sci.* 2012;89 (E-abstract 120059). **2.** Dumbleton K, Woods C, Jones L, et al. Patient and practitioner compliance with silicone hydrogel and daily disposable lens replacement in the United States. *Eye & Contact Lens.* 2009;35(4):164-171. **3.** Yeung KK, Forister JFY, Forister EF, et al. Compliance with soft contact lens replacement schedules and associated contact lens–related ocular complications: The UCLA Contact Lens Study. *Optometry.* 2010; 81(11):598-607. **4.** Dumbleton K, Woods C, Jones L, et al. Comfort and Vision with Silicone Hydrogel Lenses: Effect of Compliance. *Optom Vis Sci.* 2010;87(6):421-425.

See product instructions for complete wear, care, and safety information.

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