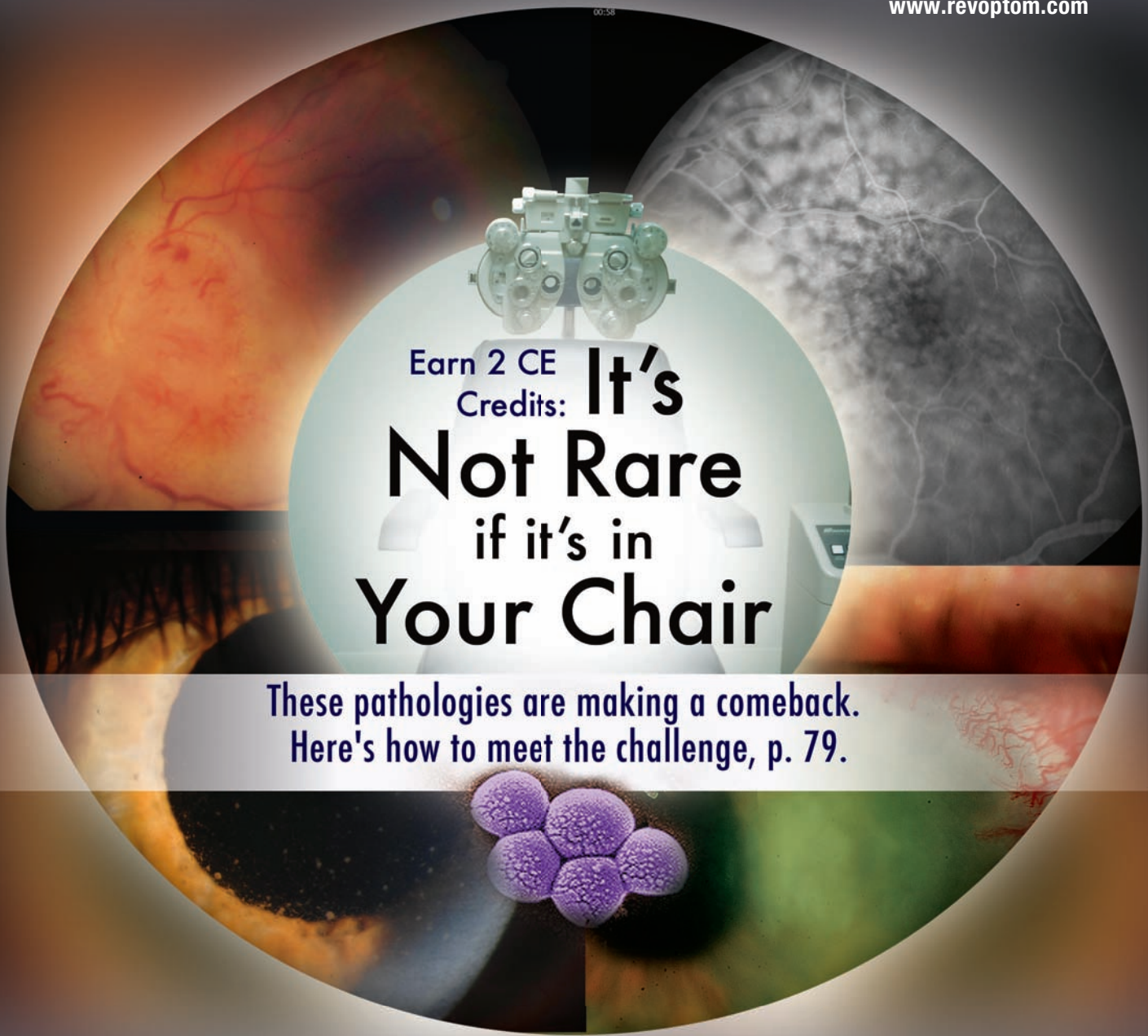
Put the 'Fun' Back in Funduscopy, p. 58

jmi

September 15, 2013

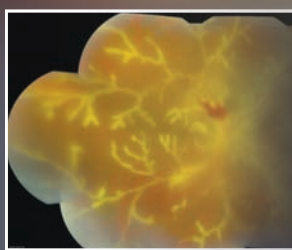
REVIEW® OF OPTOMETRY

www.revoptom.com



Earn 2 CE Credits: It's Not Rare if it's in Your Chair

These pathologies are making a comeback. Here's how to meet the challenge, p. 79.



Retina Quiz:
Dr. Dunbar diagnoses this extremely rare condition. What is it? p. 101

Dispensary Report:

Flexon®

"THE ORIGINAL MEMORY METAL"

Flexon Eyewear is an American brand founded in 1988 by Marchon Eyewear. Flexon's memory metal material is a metal alloy comprised of titanium and nickel which unlike other metals, can "remember" and return to its original set shape.

FLEXON EYEWEAR IS BORN

Marchon Eyewear patented the Flexon material and launched the first large-scale application of Flexon optical frames in 1988, with the AutoFlex Collection. In 1991 Marchon launched the Flexon Eyewear Collection geared toward a younger male with more progressive designs. By 1997 Flexon became a global brand which includes men's, women's and children's frames.

Since its launch Flexon has become the #1 Optical frame in US and has changed the world of eyewear with its unique attributes, utilizing Japanese materials and technology. Flexon frames are lighter, stronger and more comfortable than any of its competitors. From simple classic designs to edgy styles the original memory metal frames appeal to the widest range of men, women and children.

BENEFITS OF FLEXON

BETTER FIT. DURABILITY. GREATER COMFORT.

BETTER FIT

Flexon is used in the bridge, top bar and temples of frames. This allows frames to keep the shape originally set by the dispenser. Once fit, they stay fit – putting an end to frames that stretch out of shape, slide down the nose and sit unevenly.

Flexon temples are the spring hinge without the spring. The temples take the stress, not the endpiece. In the bridge and temples, Flexon prevents fronts from twisting out of shape.

DURABILITY

Conventional metals will kink or break if bent back and forth even a few times. But Flexon temples can be bent back and forth literally hundreds of times without breaking. Although, not indestructible, the benefits of frames made with Flexon are improved fit, comfort and durability over standard frames.

GREATER COMFORT

Flexon is 25% lighter in weight than metals conventionally used in frames. And it's stronger. So Flexon frames require less material for equivalent strength. The result? Flexon frames weigh less than conventional metal frames, and are a lot more comfortable.

www.flexon.com

THE EYEWEAR WITH A MEMORY

Memory metal titanium eyewear that always returns to its original shape.

Flexon®

BEND THE RULES

VOL. 150 NO. 9 ■ SEPTMEBER 15, 2013

IN THE NEWS

Bausch + Lomb launched a reformulated version of its **PreserVision AREDS 2 Formula** eye vitamins at the 2013 American Society of Retina Specialists Annual Meeting in late August. This reformulated version was updated to match the latest nutritional supplement recommendations from the **Age-Related Eye Disease Study 2** (AREDS2). A daily dose of the revised PreserVision AREDS 2 Formula provides 500mg vitamin C, 400IU vitamin E, 10mg lutein, 2mg zeaxanthin, 80mg zinc and 2mg copper. The most notable change from the original 2010 formulation was the elimination of 1,000mg of **omega-3 fatty acids**.

Oral **beta-carotene** supplementation improves visual function in patients with **retinitis pigmentosa** (RP), according to a study in August's *JAMA Ophthalmology*. Israeli researchers found that 34.5% of patients treated with beta-carotene exhibited a significant improvement in dark-adapted maximal b-wave amplitude compared to zero patients treated with a placebo. Beta-carotene may represent a new therapeutic approach for some patients with RP, the investigators concluded.

The FDA has approved **Tivicay** (dolutegravir, **GlaxoSmithKline**), a once-daily drug for the most common form of **HIV**. Classified as an integrase inhibitor, Tivicay blocks the virus from entering healthy cells. The drug is indicated to treat infected adults as a first-line therapy, or may be prescribed to established HIV patients who have previously tried other agents. Additionally, Tivicay may be prescribed to HIV+ children ages 12 and older.

An Exam Lane on Your Smartphone

New app might make taking an eye exam almost as easy as making a phone call. **By John Murphy, Executive Editor**

What if your entire exam lane could fit in your pocket? Where would you go with it? Perhaps you'd take it to the remotest parts of the world where it's too difficult to transport all the usual equipment to perform eye exams?

That's the idea behind Peek (portable eye examination kit), which packs a range of ophthalmic tests into a typical smartphone.

The goal: To allow trained personnel (not necessarily eye doctors) to take detailed diagnostic evaluations of people in all areas of the world who might otherwise never have access to an eye exam.

Developed by a team in the UK, Peek combines a mobile app and a clip-on eyepiece to provide a number of optical tests and ophthalmic evaluation procedures. "Peek can diagnose blindness, visual impairment, cataracts, glaucoma, macular degeneration, diabetic retinopathy and other retinal and optic nerve diseases, and crucial indicators of brain tumor and hemorrhage," the developers stated in a news release.

The device is not yet available, but is being field tested in Kenya, Antarctica and Scotland.

"Preliminary results show it is effective at picking up conditions such as optic disc cupping, pale nerves and swollen nerves," says one of Peek's head developers, ophthalmologist Andrew Bastawrous, MRCOphth, of the London School of Hygiene & Tropical Medicine.

Mobile app puts full exam in your hand.

The device not only performs eye tests, it stores each patient's contact information and GPS data. This information is integrated with Google Maps, creating a novel way to follow up and treat patients in far-flung regions.

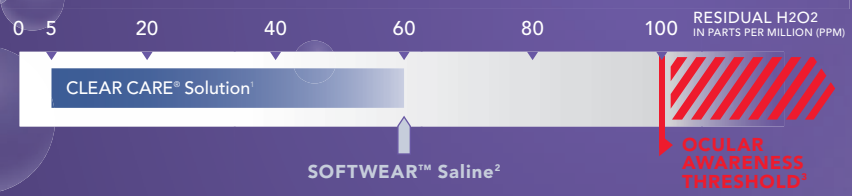
It's not intended to be used by the general public to self-diagnose. "Peek does not replace an examination by a trained health care professional," Dr. Bastawrous says.

The inventors hope to release Peek next year. It currently runs on Android 4.0, but they anticipate it will be available for use across all platforms. They expect the app to be widely available and probably free, and the clip-on hardware to be sold at a reasonable cost.

Eye doctors who want to beta-test Peek (and are willing to provide feedback) before its official release can contact the developers through the Peek website: www.peekvision.org.

WHEN IT COMES TO RESIDUAL PEROXIDE, LESS **IS MORE.**

The gold standard in peroxide cleaners, CLEAR CARE® Solution is proven to give your patients more by leaving them with less residual H_2O_2 than they can feel.



Trust the unique formula of CLEAR CARE® Solution to leave even your most sensitive patients with pristine clean and irritant-free comfort.

CLEAR CARE®
Cleaning & Disinfecting Solution

For more information, contact your sales representative today.

1. Alcon data on file. 2. SOFTWEAR™ Saline package insert. 3. Paugh J, Brennan N, Efron N. Ocular response to hydrogen peroxide. *Am J of Opt & Physical Optics*: 1988; 65:2,91-98.

Alcon®
a Novartis company

Optometry Bill Stalls in California

A bill that would expand optometrists' scope of practice in California has been shelved—at least for this year.

State senator and optometrist Ed Hernandez (D-West Covina) pulled Senate Bill 492 for this legislative session, and will instead push for its passage in 2014.

The bill would expand the role of optometrists to permit treatment of certain systemic diseases, including diabetes mellitus, hypertension and hypercholesterolemia. It would also authorize ODs to use all therapeutic pharmaceutical agents approved by the Food and Drug Administration, as provided. Additionally, the bill would remove limitations on the types of diagnostic tests an optometrist could order.

"This bill matters," Sen. Hernandez says. "It is important that we provide Californians with greater access to quality care. I will continue listening to stakeholders, but I expect to get this legislation into law."

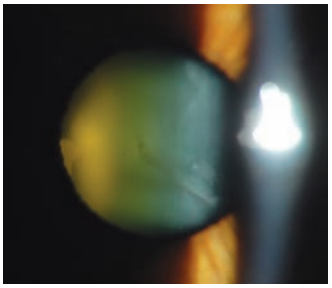
Sen. Ed Hernandez, OD, plans to revive California's optometric bill in 2014.

Sen. Hernandez also sponsored two separate bills this year to expand the scope of practice for other medical professionals, with an aim toward providing better access to health care for more Californians.

"This legislation will increase access to critical care for millions of Californians, and we are pleased that it passed the Senate," says California Optometric Association President Fred Dubick, OD. "It is a two-year bill, which is consistent with every advancement of scope bill we have run in the past decade. Our discussions in the Assembly have been positive. We will continue to work with stakeholders in the interim with the expectation that the bill will go to the governor for signature at the end of session."

Statins Prevent Cataracts, Study Says

Statin use significantly decreases an individual's risk of cataract development, according to research presented at the European Society of Cardiology Congress in Amsterdam, Netherlands.



The longer patients use statins, the less likelihood of cataracts.

In a meta-analysis of 13 clinical trials, John B. Kostis, MD, professor at the Robert Wood Johnson Medical School in New Brunswick, NJ, and associates investigated the incidence of cataract development in nearly 2.4 million patients on statin therapy. The mean age of the total study population was 61 years.

The researchers concluded that patients who remained on statin therapy for an average of 54 months were approximately 20% less likely to develop cataracts than those with no history of statin use.

Further, the research indicated that the longer patients remained on statin therapy, the less likely they were to develop cataracts. More specifically, patients who received statin treatment for six months exhibited a 10% risk reduction for cataractogenesis, whereas those who used statins for 14 years experienced a 55% risk reduction.

Interestingly, the overall incidence of cataractogenesis varied dramatically depending upon patient age. "Our analysis shows that people in their 40s who use statins have a 50% lower chance of getting cataracts. For people in their 70s, risk is lowered by just 10%," Dr. Kostis said. So, "it is possible that the two processes [aging and statins] work in parallel or interactively."

This research shows statins are not only safe, but useful against cataracts. "There is persistent concern among physicians and other health care providers about the possible cataractogenicity of statins," said Dr. Kostis. However, "our findings dispel worries about the safety of statins when it comes to cataracts, and lends additional support to long-term statin use."

Kostis JB, Dobrzynski JM. Statins prevent cataracts: a meta-analysis. Presented at the European Society of Cardiology Congress 2013. August 31-September 4; Amsterdam, Netherlands.

NEW PRODUCT RELEASE Vision Expo West Booth MS2066

100 Million are Going Undetected!

That's approximately 1 out of 3 of your patients. It's never too early to detect diabetes.

It's TOO LATE, when a patient visits their primary care physician with a complaint related to the onset of a complication of diabetes. It doesn't have to happen this way.

Diabetes can be detected early, when the patient is coming to YOU for glasses, contacts, or an annual eye exam. New breakthrough technology now makes this possible 4-7 years BEFORE the presentation of complications such as diabetic retinopathy.

Create a Diabetes Profit Center

With over 104 million eye-exams in the U.S. each year, the eye-care provider is an ideal gatekeeper for early **detecting** and **monitoring** the severity and duration of diabetes:

- 86 million people in the U.S. have prediabetes or undiagnosed diabetes
- People with diabetes have more frequent changing vision
- Diabetic patients should be recalled annually, per AOA guidelines

You can now do this now, with a quick non-invasive evaluation.

The ClearPath DS-120™ – the 1st and only device of its kind cleared by the FDA – offers these features and benefits:

- A 6 second non-invasive quantitative measurement of autofluorescence of the crystalline lens of the eye
- Touchscreen tablet display. Immediate results
- Co-manage your patients with primary care providers

Request a **FREE** manual on *"How to Turn Diabetes Detection into a Profit Center"* at support@freedom-meditech.com.

See us at Vision Expo West, booth MS2066

Corporate Offices
10455 Pacific Center Court, San Diego, CA 92121
858.638.1433 | www.freedom-meditech.com

Freedom Meditech
Vision for a Healthier Life

New Sulfa Drug Could Control Migraines

Novel pharmacological agents known as opsinamides could potentially be used to help patients who suffer from light-sensitivity associated with migraine headaches, according to a study in the August 25 online version of *Nature Chemical Biology*.

These sulfonamide-derived compounds inhibit the function of melanopsin, a photopigment found in retinal ganglion cells that helps regulate circadian rhythms and pupillary light reflex. The researchers noted that melanopsin-based receptor activity is largely responsible for triggering light sensitivity in cases of migraine headache.

In a rodent study, the researchers evaluated hundreds of chemicals to determine if any effectively blocked melanopsin, but did not inhibit the function of similar receptors responsible for visual processing. After extensive testing, they determined that in vivo administration of opsinamides prevented a normal pupillary response when the mice were exposed to bright light. Further, the opsinamides appeared to have no effect on mice that were lacking melanopsin, indicating that the compounds were specifically targeting the intended receptors.

"There are many people who would like to work when they have migraine pain exacerbated by light," says lead author Satchidananda Panda, PhD, associate professor at the Regulatory Biology Laboratory of the Salk Institute in La Jolla, Calif. "If these drugs could stop the light sensitivity associated with the headaches, it would enable them to be much more productive."

Jones KA, Hatori M, Mure LS, et al. Small-molecule antagonists of melanopsin-mediated phototransduction. Nat Chem Biol. 2013 Aug 25. [Epub ahead of print]

Nobel Prize-winning Scientist Developing 'AMD Glasses'

When the wife of Walter Kohn, PhD, began developing age-related macular degeneration, the Nobel prize-winning chemist of the University of California Santa Barbara invented a novel method for precisely measuring the visual distortions experienced by individual AMD patients. Now, Dr. Kohn is developing eyeglasses and computer aids to correct these distortions.

AMD-distorted image.

Distortion corrected.

To do so, patients view a standard Amsler grid (which appears distorted to their eyes). Using a computer mouse or a touch screen and specialized software, patients reconstruct the Amsler grid so it appears undistorted. This data is used to perfectly correct a pair of customized lenses for an individual's eyeglasses, for example. Other potential tools include interactive software to allow images and text to be viewed on a computer screen without distortion, or a handheld device (such as a smartphone or tablet) that can correct for distortions while scanning a scene, image or text. ■

REVIEW® OF OPTOMETRY

Jobson Professional Publications Group

BUSINESS OFFICES
11 Campus Blvd., Suite 100
Newtown Square, PA 19073

CEO, INFORMATION SERVICES GROUP
Marc Ferrara
(212) 274-7062 • mferrara@jobson.com

SALES MANAGER, NORTHEAST, OHIO
James Henne
(610) 492-1017 • jhenne@jobson.com

SALES MANAGER, SOUTHEAST, WEST
Michele Barrett
(610) 492-1014 • mbarrett@jobson.com

VICE PRESIDENT, OPERATIONS
Casey Foster
(610) 492-1007 • cfoster@jobson.com

VICE PRESIDENT, CLINICAL CONTENT
Paul M. Karpecki, OD, FAAO
pkarpecki@jobson.com

EDUCATION/CONFERENCE MANAGER
Meg McDonald
(610) 492-1045 • mmcdonald@jobson.com

PRODUCTION MANAGER
Scott Tobin
(610) 492-1011 • stobin@jobson.com

SENIOR CIRCULATION MANAGER
Anthony Guadagnino
(212) 219-7870 • aguadagnino@jobson.com

CLASSIFIED ADVERTISING
(888) 498-1460

SUBSCRIPTIONS
$56 a year, $88 (US) in Canada,
$209 (US) in all other countries.

SUBSCRIPTION INQUIRIES
(877) 529-1746 (US only);
outside US, call (847) 763-9630

CIRCULATION
PO Box 2025
Skokie, IL 60076
Tel: (toll free) 1-877-529-1746
Outside US: (847)763-9630
Fax: (847)763-9631

jmi

CEO, INFORMATION SERVICES GROUP
Marc Ferrara

SENIOR VICE PRESIDENT, OPERATIONS
Jeff Levitz

SENIOR VICE PRESIDENT, HUMAN RESOURCES
Lorraine Orlando

VICE PRESIDENT, CREATIVE SERVICES & PRODUCTION
Monica Tettamanzi

VICE PRESIDENT, CIRCULATION
Emelda Barea

LET'S TALK SOLUTIONS

We understand the need for portable, precise and easy-to-use instruments to help improve patient screening.
The AccuPen is a lightweight solution that requires less calibration than other handheld tonometers. Whenever you need it, or wherever you take it, the AccuPen is there to provide accurate IOP measurements.

Visit Us at Vision Expo West Booth# MS6050

AccuPen Handheld Tonometer

#24-3000

ACCUTOME®
A HALMA COMPANY

www.accutome.com/product/accupen-handheld-applanation-tonometer

3222 Phoenixville Pike, Malvern, PA 19355 USA • 800-979-2020 • 610-889-0200 • FAX 610-889-3233 • www.accutome.com

Letters to the Editor

Finding Flaws in the Formula

Regarding AREDS2 (*"What to Do With AREDS2?" June 2013*), there are two flaws in the study that I am aware of.

The researchers eliminated beta-carotene. If the researchers used the same form of beta-carotene found in the Bausch + Lomb AREDS1 formula, they employed synthesized beta-carotene rather than the natural form of the ingredient. Studies have shown that the natural form of beta-carotene does not have the same consequences in smokers that the synthesized ingredient causes.

Also, as for the results with fish oil, if the investigators used the ethyl ester form (the most common form) rather than the triglyceride form, their results might have been quite different. I recommend only the triglyceride form of fish oil to my patients.

—E. Michael Geiger, OD
Delray Beach, Fla.

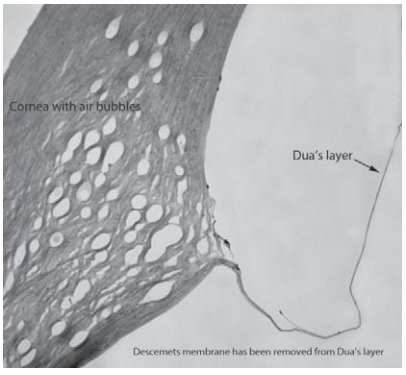
Sight Gags

By Scott Lee, OD

Dr. Binder's elegant work on the ultrastructure of the anterior and posterior cornea has been misquoted ... This is a different plane to the one we have reported, which is between 6µm to 15µm anterior to the Descemet's membrane.

Distinction of Dua's Layer

We read with interest your article "More Details on Dua's Layer of the Cornea" (*July 2013*) with the subtitle: "Perhaps discovered two decades ago, its meaning for primary eye care is unsure."



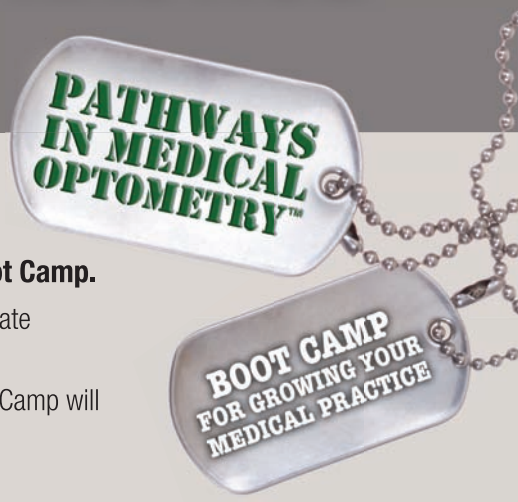
Dua's layer is located 6µm to 15µm anterior to Descemet's membrane.

In the body text of the article, one comment drew our attention: "Incidentally, Dr. Dua may not have been the first to report this layer. A paper published in 1991 by Perry Binder, MD, describes a network of fibers located at the interface of the posterior stroma and DM, although it was not identified as a distinct corneal layer." Dr. Binder's elegant work on the ultrastructure of the anterior and posterior cornea has been misquoted. Dr. Binder's study reported hitherto unknown attachments between the Descemet's membrane and the posterior stroma.[1] This is a different plane to the one we have reported, which is between 6µm to 15µm anterior to the Descemet's membrane.[2] A careful read of both papers will make this distinction clear. ■

—H.S. Dua, MD, PhD; Lana Faraj, MD, MSc; Dalia Said, MD, FRCS; Trevor Gray, MSc; James Lowe, MD, FRCPath
The University of Nottingham
Nottingham, UK

1. Binder PS, Rock ME, Schmidt KC, Anderson JA. High-voltage electron microscopy of normal human cornea. Invest Ophthalmol Vis Sci. 1991 Jul;32(8):2234-43.
2. Dua HS, Faraj LA, Said DG, Gray T, Lowe J. Human corneal anatomy redefined: a novel pre-Descemet's layer (Dua's layer). Ophthalmology. 2013 Sep;120(9):1778-85.

THE TRAINING YOU NEED TO GROW YOUR MEDICAL PRACTICE



Invest in your practice by attending a Pathways in Medical Optometry™ Boot Camp.

This course will teach you to better incorporate medical eye care into your practice.

The Pathways in Medical Optometry™ Boot Camp will help you facilitate real change.

Learn how to:

- Take Charge of Your Schedule
- Determine Vision vs Medical Plan
- Gain Access to Insurance Panels
- Improve Billing and Medical Records
- Maximize Practice Productivity and Performance

Expert faculty:

Scot Morris, OD, FAAO
John Rumpakis, OD, MBA
Allergan Eye Care Business Advisors

Register today at **AllerganODPathways.com**

Upcoming Pathways in Medical Optometry™ Saturday Course Schedule

City	Level 1	Level 2*
Houston, TX	10/12/13	12/14/13
Charlotte, NC	2/1/14	4/12/14
Atlanta, GA	3/8/14	5/17/14
Columbus, OH	4/19/14	6/21/14

City	Level 1	Level 2*
Pittsburgh, PA	5/31/14	8/2/14
Seattle, WA	8/9/14	10/18/14
Dallas, TX	9/13/14	11/8/14

Fee for ODs: $399 per level | **Fee for Staff:** $199 per level

*Level 1 is a prerequisite.

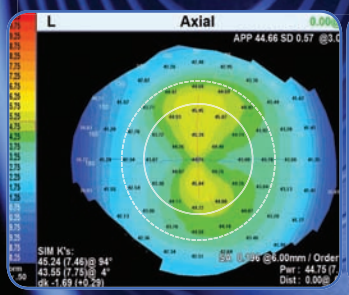
ALLERGAN

XFRACTION℠

Wavefront Optimized Refraxion With the Power to Impress

Does your practice inspire patients to refer your services to others?

NOW it will.



In less than 60 seconds, the OPD-Scan III harvests 23 critical diagnostics and determines which patients can achieve 20/20 vision with minimal refinement. The TRS-5100 then completes the needed refinement or traditional refraction, with digital speed and accuracy.

A patient's complete optical pathway and total visual system is assessed.

How will your patients be impressed?

- Significantly shorter exam times
- Patient verification of old vs. new Rx – instantly
- Educational tools that graphically display all diagnoses
- More time with you in face-to-face consults
- Time to spend in optical selection and fittings
- Fewer remakes in their lens Rx
- Solutions to day/night vision frustrations
- A new high-tech examination experience
- A completely enhanced patient experience

What's ***not*** to talk positively about with friends and family?

XFRACTION: WAVEFRONT OPTIMIZED REFRAXION

NIDEK | MARCO

Designed and Manufactured by NIDEK – Represented by MARCO

VEW • MS8031
800.874.5274
www.marco.com

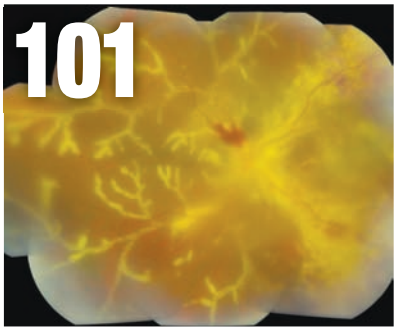
*Data based on national averages.

Contents

Review of Optometry September 2013

Departments

Review of Optometry September 2013



On The Web »

Check out our multimedia and continuing education @ *www.revoptom.com*

Digital Edition

Left your *Review of Optometry* at the office? No problem! Access *Review* on your computer or mobile device!

Go to www.revoptom.com and click on the digimag link to for the current issue.

Facebook and Twitter

For daily updates, "Like" our page on Facebook or "Follow" us on Twitter!

- www.facebook.com/revoptom
- http://twitter.com/#!/revoptom

REVIEW OF OPTOMETRY

PRINTED IN U.S.A.

FOUNDING EDITOR
FREDERICK BOGER
1891-1913

EDITORIAL OFFICES
11 CAMPUS BLVD., SUITE 100
NEWTOWN SQUARE, PA 19073
EMAIL • REVIEWOFOPTOMETRY@JOBSON.COM
WEBSITE • WWW.REVOPTOM.COM

SUBSCRIPTION INQUIRIES
1-877-529-1746
CONTINUING EDUCATION INQUIRIES
1-800-825-4696

EDITOR-IN-CHIEF • JACK PERSICO
(610) 492-1006 • JPERSICO@JOBSON.COM

EXECUTIVE EDITOR • JOHN MURPHY
(610) 492-1021 • JMURPHY@JOBSON.COM

MANAGING EDITOR • MICHAEL HOSTER
(610) 492-1028 • MHOSTER@JOBSON.COM

SENIOR EDITOR/WEB EDITOR • COLLEEN MULLARKEY
(610) 492-1005 • CMULLARKEY@JOBSON.COM

ASSOCIATE EDITOR • FRANK AULETTO
(610) 492-1043 • FAULETTO@JOBSON.COM

DIRECTOR ART/PRODUCTION • JOE MORRIS
(610) 492-1027 • JMORRIS@JOBSON.COM

ART DIRECTOR • JARED ARAUJO
(610) 492-1032 • JARAUJO@JOBSON.COM

DIRECTOR OF CE ADMINISTRATION • REGINA COMBS
(212) 274-7160 • RCOMBS@JOBSON.COM

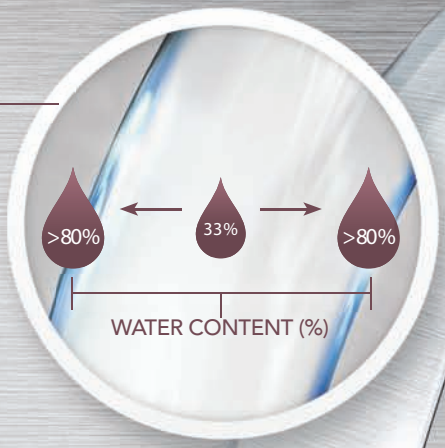
SPECIAL PROJECTS • JANE COLE
(610) 492-1043 • JCOLE@JOBSON.COM

Jobson Professional Publications Group

JOBSON MEDICAL INFORMATION LLC

jmi

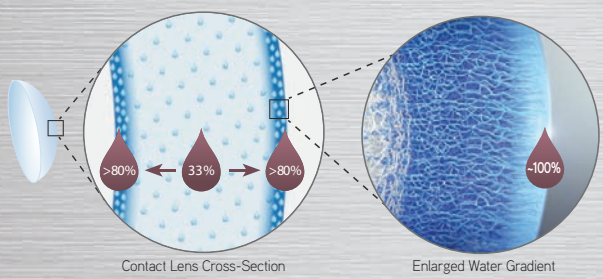
UNIQUE WATER GRADIENT



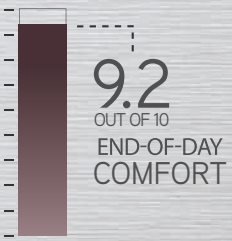
THIS IS WHY contact lenses have reached a new era in comfort.

DAILIES TOTAL1® Water Gradient Contact Lenses feature an increase from 33% to over 80% water content from core to surface[1]* for the highest oxygen transmissibility,[2] and lasting lubricity[3] for exceptional end-of-day comfort.[4]

The First and Only Water Gradient Contact Lens



Contact Lens Cross-Section | Enlarged Water Gradient



9.2
OUT OF 10
END-OF-DAY
COMFORT

UNIQUE WATER GRADIENT
Features different surface and core water contents, optimizing both surface and core properties[1]

LASTING LUBRICITY
Ultrasoft, hydrophilic surface gel approaches 100% water at the outermost surface[5] for exceptional lubricity

OUTSTANDING COMFORT
Lasting lubricity for exceptional comfort from beginning to end-of-day[4]

Let your patients experience the DAILIES TOTAL1® contact lens difference today.

PERFORMANCE DRIVEN BY SCIENCE™

*_In vitro_ measurement of unworn lenses

1. Thekveli S, Qiu Y, Kapoor Y, Kumi A, Liang W, Pruitt J. Structure-property relationship of delefilcon A lenses. Cont Lens Anterior Eye. 2012;35(suppl 1):e14.
2. Based on the ratio of lens oxygen transmissibilities among daily disposable contact lenses. Alcon data on file, 2010.
3. Alcon data on file, 2011.
4. In a randomized, subject-masked clinical study, n=40. Alcon data on file, 2011.
5. Angelini TE, Nixon RM, Dunn AC, et al. Viscoelasticity and mesh-size at the surface of hydrogels characterized with microrheology. ARVO 2013;E-abstract 500, B0137.

Rx only See product instructions for complete wear, care, and safety information. 6/13 DAL13097JAD-B

Alcon®
a Novartis company

Pamela Lowe, OD, is the owner and director of Professional Eye Care Center, Inc., in the greater Chicago area.

Consider Extended Wear for Patients Who Sleep in Their Contact Lenses

So your patients are sleeping in their contact lenses. For patients who are good candidates for overnight wear, fit them in a lens that best fits their lifestyle and needs. Changing a patient's habits may be near impossible, but it's easy to change their lenses, especially since the FDA has approved certain lenses for extended wear. Here, we'll take a look at how to choose the right candidates for extended wear.

Know Who to Target

Advances in extended wear contact lens technology have led us to a lens that is better for continuous wear due to its high Dk/t and deposit resistance: the AIR OPTIX® NIGHT & DAY® AQUA (lotrafilcon A) contact lens. ODs can also help reduce any risks by taking a careful approach to patient selection and wearing recommendations. First and foremost, we need to identify which patients are sleeping in their lenses. However, don't just ask them directly. Instead, while you have them behind the slit lamp (a.k.a. lie detector), ask how often they fall asleep in their lenses.

A patient who doesn't sleep in his lenses will answer quickly, but a patient who does sleep in his lenses will pause before answering, and his eyes will change gaze (usually looking up to the side of the brain that calculates numbers) while he tries to figure out how often he actually does sleep in his lenses. You'll be surprised at how this method reveals a much more accurate picture of the patients in your practice who sleep in their lenses.

Once I have revealed a patient who sleeps in his contact lenses, I always point out the positives of his contact lens modality along with what he can do for the best results.

The Case for Continuous Wear

I tell my patients that my preference is daily disposable contact lens wear, but that this modality is not appropriate for over night wear. So, if they do tend to sleep in their lenses, then I recommend fitting them in a lens option that is better for their lifestyle—one that has excellent lipid deposit resistance and promotes compliance: the AIR OPTIX® NIGHT & DAY® AQUA contact lens.

Once I fit a patient with AIR OPTIX® NIGHT & DAY® AQUA contact lenses, I review the following basic rules of continuous wear:

- Never sleep in contact lenses if eyes are exposed to any swimming or hot tub water sources without first properly disinfecting them.
- Never wear lenses longer than the FDA-approved time of 30 days.
- If any issues arise, contact your optometrist.

For extended or continuous wear lenses, I have found that educated, informed patients help me do a much better job of successfully fulfilling their needs while providing a healthy alternative. A study by Schein, et al. has given us great evidence-based science that shows that a patient can have healthy extended/continuous wear in their contact lenses.[1]

This rigorous post-market surveillance study of 6,000+ lotrafilcon A contact lens wearers showed less than 0.04% incidence of microbial keratitis resulting in reduction of visual acuity (<4 out of 10,000 patients),[1] a low 0.18% overall annual rate of presumed microbial keratitis (18 out of 10,000 patients)[1] and lower rate of presumed microbial keratitis with ≥3 weeks continuous wear vs. <3 weeks (p=0.02).[1]

Proof in Practice

Primary care optometrists must accept the reality that a good portion of our contact lens wearers sleep in their lenses, whether we approve them to do so or not. It is our charge to know who these patients are and to fit them in a lens appropriate for their lifestyle and approved for their lens wearing behavior.

In fitting the AIR OPTIX® NIGHT & DAY® AQUA contact lens as my lens of choice for all patients who sleep in their contact lenses, I have found a huge clinical benefit in patients not touching their eyes. The patients who fare the best in my practice are the 30-day continuous contact lens wearers who only need to handle a lens and touch their eye 12 times a year!

Reference: 1. Schein OD, McNally JJ, Katz J, et al. The incidence of microbial keratitis among wearers of a 30-day silicone hydrogel extended-wear contact lens. Ophthalmology. 2005;112(12):2172–9.

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

Rx only

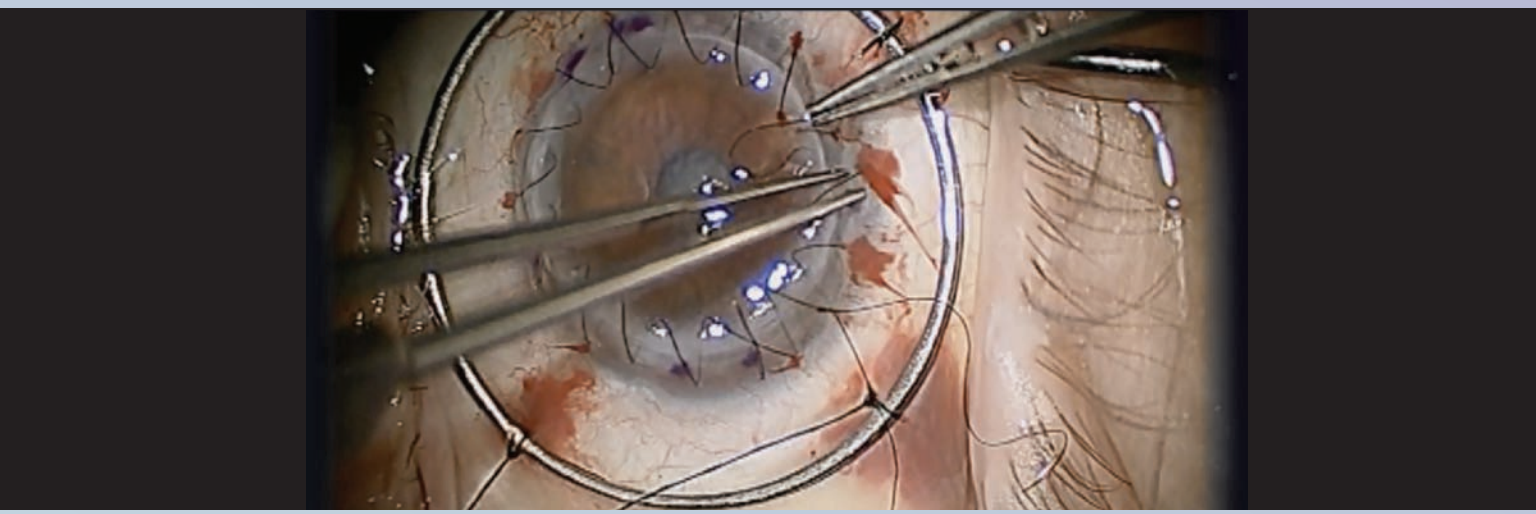
Important information for AIR OPTIX® NIGHT & DAY® AQUA (lotrafilcon A) contact lenses: Indicated for vision correction for daily wear (worn only while awake) or extended wear (worn while awake and asleep) for up to 30 nights. **Relevant Warnings:** A corneal ulcer may develop rapidly and cause eye pain, redness or blurry vision as it progresses. If left untreated, a scar, and in rare cases loss of vision, may result. The risk of serious problems is greater for extended wear vs. daily wear and smoking increases this risk. A one-year post-market study found 0.18% (18 out of 10,000) of wearers developed a severe corneal infection, with 0.04% (4 out of 10,000) of wearers experiencing a permanent reduction in vision by two or more rows of letters on an eye chart. **Relevant Precautions:** Not everyone can wear for 30 nights. Approximately 80% of wearers can wear the lenses for extended wear. About two-thirds of wearers achieve the full 30 nights continuous wear. Side Effects: In clinical trials, approximately 3-5% of wearers experience at least one episode of infiltrative keratitis, a localized inflammation of the cornea which may be accompanied by mild to severe pain and may require the use of antibiotic eye drops for up to one week. Other less serious side effects were conjunctivitis, lid irritation or lens discomfort including dryness, mild burning or stinging. **Contraindications:** Contact lenses should not be worn if you have: eye infection or inflammation (redness and/or swelling); eye disease, injury or dryness that interferes with contact lens wear; systemic disease that may be affected by or impact lens wear; certain allergic conditions or using certain medications (ex. some eye medications). Additional Information: Lenses should be replaced every month. If removed before then, lenses should be cleaned and disinfected before wearing again. Always follow the eye care professional's recommended lens wear, care and replacement schedule. Consult package insert for complete information, available without charge by calling **(800) 241-5999** or go to **myalcon.com**.

Alcon®

a Novartis company

Surgical Minute

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



See the view through the operating microscopes of some of the best eye surgeons in the US, with expert commentary from comanaging optometrists.

Surgical Minute

PK: Right on the Button

When all else fails, penetrating keratoplasty offers a chance for better acuity.

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

On The Web >> View a narrated video of penetrating keratoplasty.

Penetrating keratoplasty (PK) is a full-thickness transplant in which the damaged central cornea (7mm to 9mm) is removed and replaced with donor tissue. Compared with other types of tissue transplants, it has a long and outstanding record of success; more than 46,000 corneal transplants were performed in 2011, according to Eye Bank Association of America.

The most common indications for penetrating keratoplasty are regrafting, keratoconus, Fuchs' endothelial dystrophy, pseudophakic bullous keratopathy, perforated corneas, traumatic scars and viral keratitis.

The advantages of penetrating keratoplasty include the full removal of damaged corneal tissue, improved optical clarity, restored corneal anatomy, ease of performance compared to other corneal transplant procedures, improved cosmetic appearance and the potential for good optical results.

Some disadvantages are a higher risk of graft rejection, post-op astigmatism, suture management, intraocular complications and traumatic corneal rupture.

Variations of the procedure include deep anterior lamellar keratoplasty (DALK), Descemet's stripping endothelial keratoplasty (DSEK) and Descemet's membrane endothelial keratoplasty (DMEK). The choice of procedure (PK or one of the above variations) depends on which corneal layers have been affected.

The procedure begins with the preparation of the donor tissue. A trephine (a circular cutting device) is used to cut the donor cornea, followed by trephination of a similar sized portion (7mm to 9mm) of the patient's cornea. Once the recipient's corneal button has been removed, the anterior chamber is filled with balanced salt solution or sodium hyaluronate and the donor button is placed into position.

Four cardinal sutures of 10-0 nylon are placed at 90° intervals in the donor graft, just above Descemet's membrane. The sutures are then passed into the recipient's cornea at the same level, at approximately 1.5mm into the host tissue. Once the needle is passed though, the suture is tied and buried. After the cardinal sutures are in place, suturing can be completed with a single running suture or interrupted sutures.

Postoperatively, patients are prescribed topical antibiotics for one to two weeks as well as topical steroids, which are tapered over several months. Many times, patients are kept on low-dose topical steroids to reduce the risk of graft rejection and failure. Sutures can be removed as soon as two to three months, if needed. Or, if a patient has little astigmatism and the sutures are not causing any problems, they can be left in place for many years.

As comanaging optometrists, our main concern is the long term management and visual function. Postoperatively, corneas may take anywhere from 18 to 24 months to fully stabilize, so be sure to continuously monitor patients for adequate visual acuity and functional vision. Communicate with your corneal specialist to decide when patients are sufficiently stable for contact lenses. A specialty contact lens (GP or hybrid) may be considered as soon as three months after surgery, but may need several changes and modifications once the sutures are removed. ■

This innovative video series puts *you* in the OR.

New cases monthly!
For current and archival videos, please visit:

Download a QR scanner app. Launch app and hold your mobile device over the code to view the videos.

www.revoptom.com/multimedia

REVIEW® OF OPTOMETRY

Left your *Review of Optometry* magazine at the office? No problem!

Get *Review* sent to your desktop or mobile device!

Just simply go to www.revoptom.com and click on the digimag link to get your current issue.

From the Box Office to Your Office

Value your services appropriately—and patients will do the same.

By Jack Persico, Editor-in-Chief

Whenever I go to the movies, I feel bad for the kid who works the counter at the concession stand. Apparently they're all forced to deliver the same spiel to each and every person, hawking some fast food special that the theater assumes—based on zero evidence—customers will consider a newfound delicacy.

"Welcome to Regal Cinema," the listless teen will say with unconcealed boredom. "Would you like to try our jalapeño and onion pretzel bites with Chili Cheez Whiz?" No, thanks. That sounds revolting. More importantly, it's not what I just waited in line 15 minutes to order. I *know* what I want—your tepid sales pitch is definitely not it.

Is this how you feel your patients will react if you mention some of the pricier products you dispense at the practice? It's a common refrain: despite relying on optical dispensing to generate the bulk of their practice revenue, optometrists have an uneasy relationship with the 'sales' encounter. But too much deference to a perceived impropriety might actually deprive a patient of an outcome they hoped to achieve by visiting you in the first place.

So, what does the movie concession kid get wrong? At least three things. First, he assumes I want his recommendation. I do not. In what way is he an expert on the matter? Second, he fails to customize the experience to me. A one-size-fits-all sales pitch shows obvious lack of concern for the individual's unique needs and interests. Third, he does not convey value. Nothing he tells me convinces me that adding another item or switching my order is in my best interest.

Optometrists, by contrast, are experts whose recommendations are highly valued, and who devote the entire encounter to identifying the patient's unique needs. So, I think it comes down to that third item—the ability to communicate value—that separates high-volume practices from the less robust ones.

As emphasized in this month's feature on competing with online retailers (see page 36), perceived value is the key driver of buying decisions. Patients will price shop if you've given them no compelling way to differentiate your services from cut-rate discounters.

That also might explain why ODs don't do better with daily disposable lenses, recommending them for only about 15% of their single vision soft lens fits, according to data from Kantar Media Healthcare Research's *2013 Eyecare Readership* report. When the convenience and health benefits are communicated clearly, patients will be receptive and it won't feel like a sales job.

You'll find plenty of creative ideas from your colleagues in our Dispensary Report this month. For instance, Justin Bazan, OD, uses a UV meter to test the safety (or lack thereof) of the patient's sunglasses as a way to stress the value of better products. And Lorraine Labiento Smith, OD, noticed that petite women kept trying on the kids' frames at her practice—so, she started promoting that!

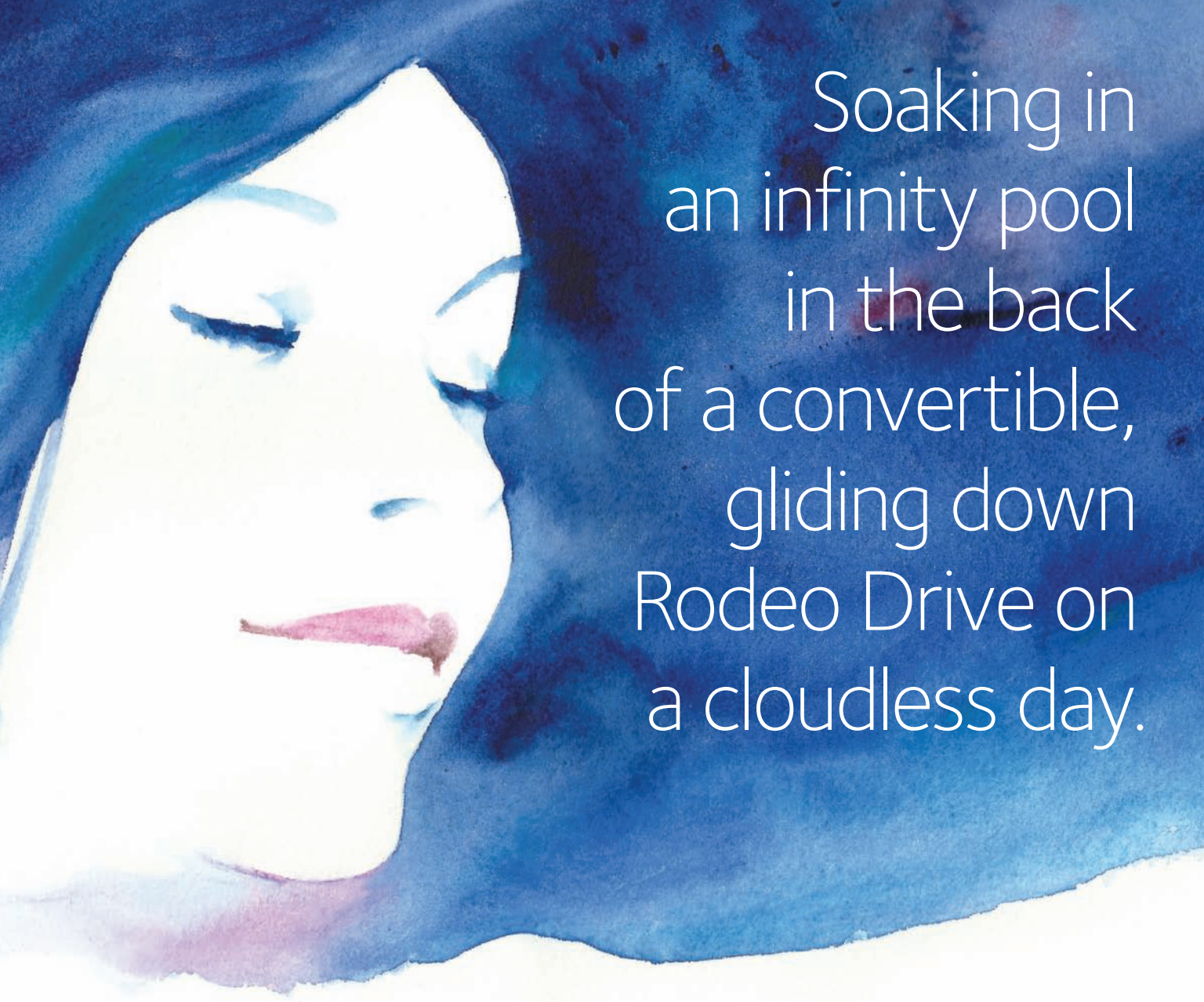
Opportunities for healthier patients—and revenue—abound once you give up the notion that 'sales' is a four-letter word. Thumbs up to that. Make some popcorn and dig in. ■

Eye-opening Data

Just how routine is "routine dilation"? It varies considerably. When asked how often they dilate patients during comprehensive exams, the optometrists polled by Kantar Media diverged widely in their practice patterns. The mean response was 55.6% of exams, but the distribution follows a bimodal curve, with peaks at both the 21-30% and 91-99% ranges. Just 7% of respondents said they dilate 100% of their patients. Note that the question specified 'comprehensive' exams.

In our own recent survey of *Review of Optometry* readers, we found greater affinity for routine dilation in patients with diagnosed cases of glaucoma or diabetes. Readers told us that 74% dilate such patients at least annually and another 20% do so commensurate with the level of disease severity. It's encouraging to see that optometrists recognize the importance of routine dilation in the presence of pre-existing pathology, but a sizable number are still not on board with routine dilation being part and parcel of a comprehensive exam.

To rediscover your enthusiasm for this essential service, and improve your technique, be sure to check out *"Put the 'Fun' Back in Funduscopy"* on page 58 this month. It's the second installment of our series on the 'lost arts' of optometry. Enjoy!



Impossibly comfortable.

A contact lens so comfortable that it tests your patients' powers of imagination? Absolutely. Thanks to Aquaform® Technology, CooperVision® Biofinity® lenses deliver a combination of breathability and moisture higher than the leading silicone hydrogel brands. In sphere, toric and multifocal designs.

Biofinity® contact lenses

Ask your CooperVision Sales Representative about our current promotions.

CooperVision®
Live Brightly.®

Optometry's Wisest Words

"It ain't a rare zebra if a horse is in your chair." Optometry has many such colorful and wise sayings, most of which I forget. Here are some more! **By Montgomery Vickers, OD**

Most of us old timers built our success on our understanding of tried and tested words of optometric wisdom. So, as summer ebbs and a new optometry school year starts, please allow me to remind you, in no particular order, of...

Optometry's wisest words!

• **"7 and 4 and out the door."** Hmm, this one may not work anymore as technology and the evolution of medical eye care require us to do more than just refraction and retinoscopy. On the other hand, I ain't giving up refractions to anybody in my office. It's the only thing I do better than they do!

• **"Anesthetic first, gonioscopy second."** Try it the other way once and you'll never forget. I did and I don't.

• **"Read the red-capped bottle before using."** Sure, atropine is a great dilator, but your patient may actually have to go to work sometime in the next couple of weeks.

• **"Never re-hire a former employee."** No matter how good she or he was, please heed this warning. Even if she was Mother Teresa.

• **"Always check references."** In my whole career, the applicant who no doubt had the best interview was wanted on a federal warrant for money laundering and drug dealing in the state of Illinois. She's great with insurance billing, but my phone has been tapped since 1984.

• **"Never agree to let a patient make payments."** It makes more sense to just give them whatever they want so you don't spend 10 years trying to collect the money.

• **"Brown eyes are a sign of high intelligence."** This has nothing to do with my own brown eyes. It's just a fact.

• **"Beware all engineers."** They probably know more about optics than you do. I've found that the best way to communicate with them is with optometry shorthand. They will never admit they don't know what NPBDR means. They just nod wisely and Google it later.

• **"A hyperopic shift makes the doctor seem smarter."** I have no doubt in my mind about this.

• **"A myopic shift makes the doctor seem dumber."** It's true for all patients older than 42.

• **"The closer a patient's Rx is to plano, the more likely they'll change doctors every year."** They'll be back once they get it through their thick skulls that you were right after all. Strive to be the third doctor who recommended a PAL. By then, their will has been broken.

• **"Mo' employees, mo' problems."** When we had eight employees, we had two who really worked hard. Now that we have two and a half employees, they work like they're eight employees.

• **"99% of doctors install their office security system exactly 24 hours after they are robbed."** I did.

• **"EHRs mean less paper."** Bull.

• **"EHRs will free up your time to do more important things."** For example, you'll have time to spend calling your EHR company so they can fix what doesn't work right.

• **"Sending reports to the patient's PCP leads to more referrals"**—to their ophthalmologist golf buddy. (Seriously, after 30 years of consistent written reports, my referrals from PCPs have increased by 100%! Last year we got four.)

• **"ODs talking about fees is an antitrust violation."** So, let's have politicians decide what doctors should make—and doctors decide what politicians should make.

I hope you feel smarter now. Relish it. It won't last long. ■

Build Patient Loyalty and Practice Success with Daily Disposables

Grow your daily disposable contact lens volume by emphasizing their value—and by letting patients experience their comfort and convenience firsthand. — **Jeffrey C. Fogt, OD**

About 60% of the patients in my northwest Ohio practice are contact lens wearers, and just under 80% of them are in daily disposables. I attribute this success to my practice team's consistent presentation and messaging about these lenses.

First, I talk to every eligible patient about contact lenses. With the technology available today, virtually any patient with healthy eyes, refractive need, and appropriate motivation can be a contact lens wearer—and many, if not most, can wear daily disposables.

As an early adopter of daily disposables—for myself as well as my practice—I have an easy time conveying enthusiasm about them. Not only are daily disposables the most convenient contact lens modality, I find them to be the most comfortable—and I let patients know that. While not all eyecare practitioners will be able to give a personal endorsement like this, an important key to success with daily disposables (as with any technology) is a strong recommendation in the exam room.

The Comfort Connection

When I introduce DAILIES® AquaComfort Plus® contact lenses to patients, I always talk about comfort. I tell patients that the lenses are engineered for sustained comfort, with a built-in wetting agent that is released with every blink, all day long. I bring this message home by linking the comfort benefits of these lenses to each patient's situation and needs.

Once a patient has expressed an interest in wearing daily disposables—and I have completed the exam and found a suitable fit—I send the patient home in the lenses, with enough additional lenses to last until a follow-up visit scheduled in 5 to 7 days.

Work the Numbers

Some patients assume that daily disposable lenses come at a high price—and some practitioners may avoid offering these lenses on the assumption that patients will balk at paying for them. But practitioners who succeed with daily disposable lenses know (and tell their patients) that daily disposables can be a great value.

I have found that actually doing a quick written calculation for the patient crystallizes this. I list the price of a year's supply of DAILIES® AquaComfort Plus® contact lenses, subtract the manufacturer's rebate, and then compare that to the annual price of the 2-week lenses the patient is currently wearing, plus the cost of a year's supply of contact lens solution. Seeing just how affordable the daily disposable option can be helps patients to frame the decision more clearly, and they leave the exam room feeling positive and well-informed.

SECURING THE ANNUAL SUPPLY

Purchasing an annual supply is the "default" option in my practice—and 50% to 60% of our patients opt for it. My staff and I base all discussions of cost on an annual supply, and we offer a small discount. But the benefits to patients—particularly daily disposable wearers—are more than just economic: Patients who purchase an annual supply are also more compliant.[1]*

Bring it All Together

I work with my staff to keep messaging around daily disposable lenses consistent, upbeat, and reinforced with point-of-purchase advertising materials and discussions on social media. Patient enthusiasm for these lenses, moreover, has generated significant word-of-mouth referrals to our practice.

Any patient who is eligible for daily disposable contact lenses should be offered an opportunity to try them—there is no reason to continue in another modality if a more satisfying option is available. My daily disposable lens patients are enthusiastic, loyal, and reliably return for their annual visits. DAILIES® AquaComfort Plus® brand contact lenses offer a simple way to turn satisfied patients into exceptionally happy ones who remain with the practice and talk about it to their friends and neighbors.

Jeffrey C. Fogt, OD, practices at Professional Vision Services in Defiance, OH.

REFERENCE
1. Dumbleton K, Richter D, Berkenske P, Jones LW. Compliance with lens replacement and the interval between eye examinations. *Optom Vis Sci.* 2013;90(4):351-8.

*Compliance with manufacturer-recommended replacement frequency.

Coding **Abstract**

Mind Your Ps & 'Q's

For temporary physician services, use the Q modifiers—with care.

By John Rumpakis, OD, MBA, Clinical Coding Editor

Q I'm going to work one day a week at another doctor's office. I'm not credentialed for his third-party plans and he wants to bill the exams I do under his provider number. Is this legitimate and might I be at any risk participating?

A Yes, it's legitimate. The ability for a fill-in doctor to see the patients of a regular practitioner is allowed by the appropriate use of the Q5 or Q6 modifiers.

Q5 for Reciprocal Billing

Q5 denotes a reciprocal billing arrangement. The regular doctor may submit the claim and receive payment for covered services (including emergency visits), which are provided by a substitute doctor on an occasional reciprocal basis, if all of the following apply:

- The regular doctor is unavailable to provide the services.
- The patient has arranged or seeks to receive the services from the regular doctor.
- The substitute doctor does not provide the services to Medicare patients for a continuous period of more than 60 days.
- The regular doctor identifies the services as "substitute doctor services" by entering the appropriate CPT code with the -Q5 modifier ("service furnished by a substitute doctor under a reciprocal billing arrangement") after each specific procedure code.

Q6 for Locum Tenens

Q6 is used to indicate when there is a locum tenens arrangement. Practices usually use a locum tenens ("deputy" in Latin) doctor when the regular doctor is absent because of vacation, illness, childbirth, business, education, active duty or having left the practice.

The regular doctor may submit the claim and receive payment for covered services (including emergency visits) of a locum tenens doctor who isn't an employee of the regular doctor, if all of the following apply:

- The regular doctor is unavailable to provide the services.
- The Medicare beneficiary has arranged to receive the services from the regular doctor.
- The regular doctor pays the locum tenens for his/her services on a per diem or similar fee-for-time basis.
- The substitute doctor does not provide the services to Medicare patients for longer than a continuous period of 60 days.
- The regular doctor identifies the services as "substitute doctor services" by entering in the appropriate CPT code with the -Q6 modifier ("service furnished by a locum tenens physician") after each specific procedure code.

Follow the Rules

To ensure you get paid and stay in compliance, you must adhere to Medicare and commercial payer guidelines—and the rules are fairly specific.[1]

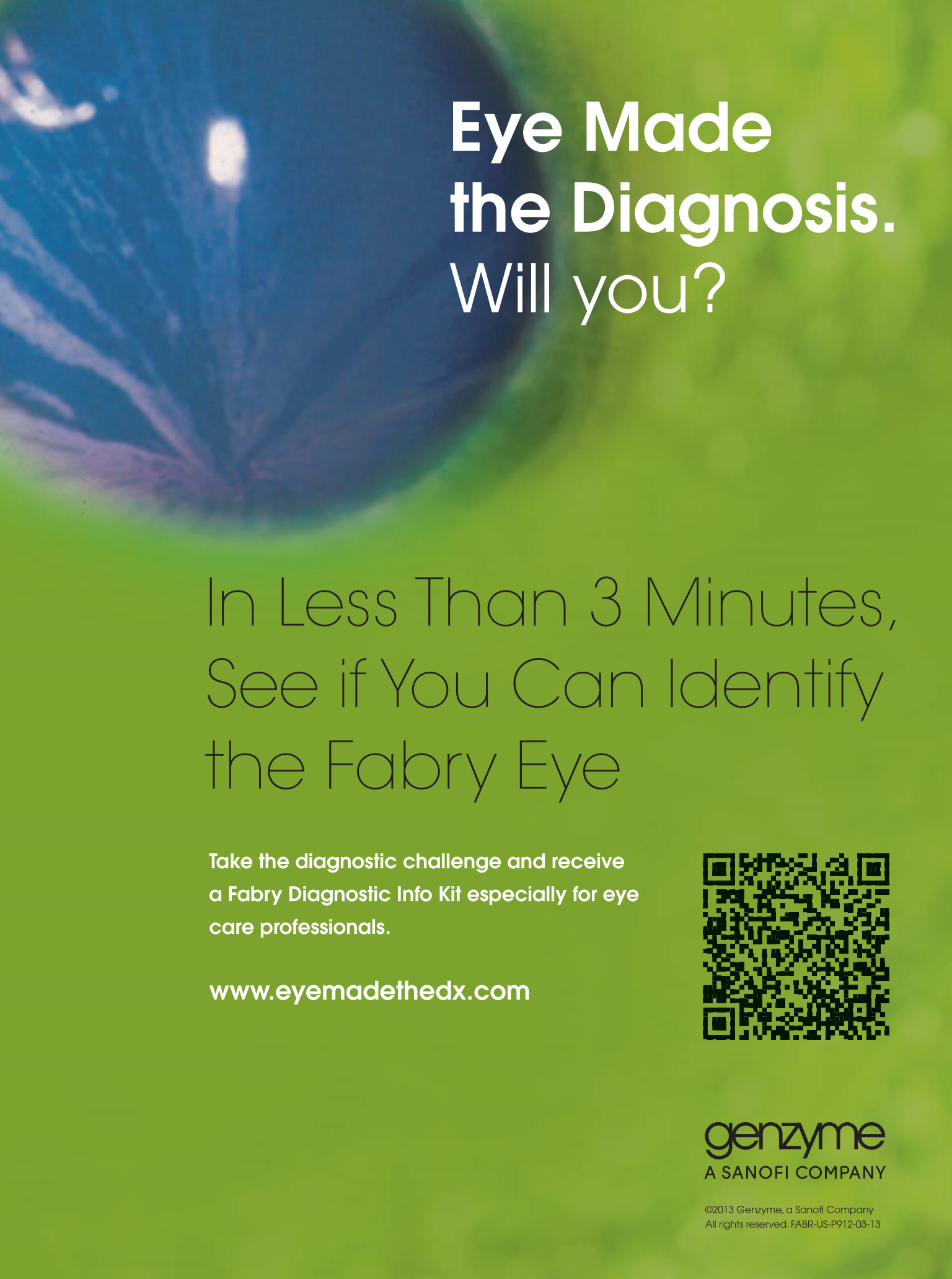
For instance, the period a temp doc may substitute for the regular doctor cannot be more than 60 continuous (not work) days.

There are obligations and responsibilities for both parties during this period. For instance, the regular doctor must bill for the services of the temporary doctor, must put his or her National Provider Identification (NPI) number on all filed claims, and may reimburse the temp doc a fixed amount per diem or similar fee. Also, the regular doctor is the only one who can break the 60-day period, and can reset the 60-day period by returning to practice and seeing patients one day after the initial 60 days and using the same fill-in doctor.

Meanwhile, the temporary doctor cannot bill Medicare for services within the 60-day continuous period in his or her name or NPI. Also, the temp doc cannot fill in for more than 60 continuous calendar days (unless the regular doctor comes in and resets the 60-day period), and cannot reset the 60-day clock by taking a day off. The temporary doctor doesn't have to be enrolled in the Medicare program to see Medicare patients.

Some commercial payers have different rules on the use of a locum tenens doctor—Tricare, the Blues and some Medicaid programs come to mind. Following the rules will protect your practice, protect your patients, protect the temporary doctor and protect your cash flow. ■

1. Centers for Medicare & Medicaid Services. Chapter 1: General Billing Requirements. In: Medicare Claims Processing Manual. Updated Feb 1, 2013. Available at: www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/clm104c01.pdf. Accessed Aug 21, 2013


Eye Made
the Diagnosis.
Will you?
In Less Than 3 Minutes,
See if You Can Identify
the Fabry Eye
Take the diagnostic challenge and receive a Fabry Diagnostic Info Kit especially for eye care professionals.
www.eyemadethedx.com
genzyme
A SANOFI COMPANY
©2013 Genzyme, a Sanofi Company
All rights reserved. FABR-US-P912-03-13

Design Do's & Don'ts From the Experts

You asked, and the experts answered. Design specialists share their top tips for office layout and flow, optical space, fixing common office design blunders, and more.

By Colleen Mullarkey, Senior Editor/Web Editor

Q I'm not really crazy about our current, rectangular layout. But I'm not exactly sure how to remedy the problem. Do you have any suggestions about how we could make it more appealing and welcoming?

Barbara W. Wright: This office is suffering from a bad case of the "blahs." All the colors are safe neutrals. Replacing the stark white walls with a rich color (like sage green or brick red, for example) and reupholstering the chairs in a patterned fabric that blends with the wall color would make a big difference.

Patricia Bobilin: The space can very easily be transformed into something interesting by adding accent colors and finishes, improved lighting and additional walls. They need to work with a professional designer who can show them how to accomplish this goal

Lori Estrada: I'd use the windows more for display, put in a nice seating area on one side (perhaps with a refreshment bar), and use the other side of the room for optical. This would give it a less "symmetrical" look and make the display area more cohesive.

As it is now, the displays are in several smaller sections, with no designation as to what merchandise is where, such as women's or men's frames, kid's or even sunglasses. Just like in any retail store, it's nice to know you're looking in the right department where you can find the product that's right for you.

Does your office, like this one, have a case of the 'blahs'? Start afresh by adding some color and rearranging the space to create a more cohesive display area.

Meet the Experts

- **Barbara W. Wright, CID**, president of Barbara Wright Design in Smyrna, Tenn.
- **Patricia Bobilin**, managing director, Southern Region, at Eye Designs in Collegeville, Pa.
- **Lori Estrada**, designer at Fashion Optical Displays in Paradise, Calif.

Q My current optical layout has a lot of bottlenecks. Can you suggest any ways to improve the flow?

BW: Most bottlenecks in the optical can be improved two different ways: separating or duplicating. Duplicating how and/or where a patient pays for services can fix payment bottlenecks. Adding another payment station to the front desk is one way; but if a practitioner doesn't have space to do this, he or she can add a tablet with payment capabilities so opticians can take payments right at the dispensing table.

PB: To minimize bottlenecks, we typical look at the traffic patterns as well as the function of the area to ensure there is ample space to move freely through the office. For instance, if the check-out area is close to the main corridor, we'd move it back to allow patients and staff to move through the space.

We also suggest using "transition" displays to attract and guide patients into the optical. And there must be a non-obstructive path into the optical so patients feel comfortable to wander in without having to be invited by optician or receptionist.

LE: There should be a minimum of three feet around each dispensing table, per the Americans with Disabilities Act. However, take into account that chairs are moving in and out, and often there are additional chairs for a spouse or guest of your patients, so the more space you can provide, the fewer bottlenecks.

Using certain stations for fitting and ordering frames and lenses, and other stations for picking up and adjusting glasses, will maximize staff efficiency and minimize extra traffic on the optical floor.

If patients are allowed to browse

Optometry Design on a Dime

When optometrist Cathy Wittman opened her private practice in Lubbock, Texas, she had only a shoestring budget for office design. But with a little creativity and resourcefulness, she managed to cut costs without sacrificing style.

"If I had the funds, it would have been nice to have a design company do it. But it was fun to shop around for deals, and getting plugged into Pinterest was a great way to save ideas," she says. "That's what happens when you have to do things on a budget—you have to look around and get creative."

The Pinterest page Dr. Wittman created, "Optometry Office Ideas," allowed her to store design ideas from all over the web and easily access them in one place. Now with nearly 600 followers, it's also provided an excellent forum to save and share those ideas with other ODs (http://pinterest.com/caprockeyedoc/optometry-office-ideas). She got inspiration not only from professional optometry design companies, but also from local consignment shops, thrift stores, discount retailers, and even eBay and Craigslist.

Dr. Wittman's design scheme actually came together after a great find for just $600 at a local consignment store—a high-end custom design couch with the packing slip still attached. "I wasn't particularly drawn to it, but my friend who's good with design said I should take a look at it because 'it looks like waiting room furniture,'" she says. "We actually **put together a color scheme**, just like an interior designer would do, by color matching with the couch. I kept that color scheme in my purse for months so that whenever I was out and about, I could use it to match items."

One of the most eye-catching design pieces in the office was low on cost but high on ingenuity. With a little black paint and some scrapbook paper, Dr. Wittman transformed some wall clocks (which she bought on clearance from Amazon) into wall art inspired by the Farnsworth D15 color blindness test.

"Overall, it took a lot of time and effort, but it was worth it," she says. "We spent less than $5,500 for our entire office décor—including couches, display cases, desks, chairs, dispensary tables, artwork and various decorations (but not including optometry equipment or our frame inventory)."

and try on frames, make sure there is adequate space in front of the displays, and easy access to a mirror, so patients don't have to walk around unnecessarily.

Q. I'm trying to figure out a better office layout, to improve the flow starting from the moment patients step into the office until they exit. Any suggestions?

BW: Patient flow issues are often difficult to solve and usually require changes in the floor plan. A professional designer can look at your floor plan and see possibilities in it that you won't see on your own. (Better yet, engage an optical specialist to design your floor plan with great patient flow in the first place, so you don't have to try to fix it later.)

PB: The best way to figure an improved layout with improved patient flow is to learn how the doctor likes to work and move patients through the office, which will identify any potential bottlenecks and lead to a layout that addresses the office's proper design needs.

LE: In addition, it's also good to assess your office flow from the perspective of your patients. It's sometimes difficult to look at things differently when you are used to seeing the same thing day after day, so try walking into your practice as if you're a brand new patient, and then ask yourself:

- Is it obvious where I should check in?
- Is there a staff person there to greet me immediately?
- Is there a clear path to the reception desk, or do I have to walk through a crowded waiting room and/or a busy optical to get there?
- Is there adequate seating? Note: Bench seats and couches are OK for families, but are not as practical as individual chairs. Couches take up more space and patients don't generally like sitting next to people they don't know.
- Are the hallways wide enough for foot traffic and wheelchairs?
- Is there a dedicated checkout area, preferably with some privacy, where patients are not discussing finances in front of others who are checking in? ■

Have you recently renovated your office?
Turn to page 30 to enter our 2013 "New Look" Office Design Contest, and you might see your office in the pages of *Review!*

The moment your wavefront refraction creates an unparalleled visual outcome.

This is the moment we work for.

Visit us at **VEW** Booth # LP8065

Vision excellence with i.Scription® technology.

"i.Scription technology is the next logical evolution in customized eye care and is the necessary standard of care in private practice if you are going to be successful in the 21st century."
Dr. David Kaplan, *Family Eyecare of Glendale.*

Only i.Scription by ZEISS combines wavefront aberrometry from the i.Profiler plus® with your subjective refraction to create customized eyeglasses that deliver better vision in all lighting conditions.

To learn more about the show specials and how you can achieve:

■ Higher levels of patient satisfaction ■ Unique practice differentiation ■ Increased sales

Visit www.zeiss.com/equipment or call 858-790-7629.

ZEISS

We make it visible.

2013 "New Look" Office Design Contest

Objective: *Review of Optometry*'s "New Look" Office Design Contest recognizes optometric practices that incorporate functionality, optimum use of space and stylistic appeal with up-to-date clinical technology.

Eligibility: Newly built offices and office remodels or expansions completed between January 1, 2011 and June 30, 2013 are eligible to enter the 2013 "New Look" Office Design Contest. Previous entrants can resubmit for consideration, as long as they have not previously won.

Judging: Entries will be judged by a panel of fellow optometrists who have been previously recognized for their expertise in office design.

The contest will be divided into two categories:

- Renovation of Existing Office
- New Office/Expansion

Awards: "Office Design of the Year" will be awarded to the best overall facility, based upon functional design, efficient interior space planning, style and appropriate integration of optometry equipment and technology. There will be a total of four winners—one small practice and one large practice will be selected from each category.

Each winner will receive an engraved office plaque recognizing the practice's achievement, in addition to editorial coverage online and in the December 2013 print edition of *Review of Optometry*.

How to Enter: Send your completed contest entry form and three to four high-resolution images to Editor in Chief Jack Persico. Images should illustrate the contest's four design principles—function, optometric equipment, aesthetics, and ergonomics. They must be no less than 300 dots per inch (dpi) and should be saved as .tif or .jpg files. Files can also be via YouSendIt or Dropbox.

- ***Email:*** jpersico@jobson.com
- ***Mail:*** Review of Optometry
  New Look Office Design Contest
  11 Campus Blvd., Suite 100
  Newtown Square, PA 19073

PROFIT BY DESIGN

VISIT US AT VISION EXPO WEST - **BOOTH 16076**

St. John's Eye Associates, Ponte Vedra, FL


Danbury Eye Physicians & Surgeons, New Milford, CT


Ratchford Eye Center, Berlin, CT

GET STARTED

VISIT US TODAY

SPACE PLANNING
INTERIOR DESIGN
DISPLAY INNOVATION
MANUFACTURING

EYE DESIGNS®
CUSTOM INTERIORS + FURNITURE

VISIT WWW.EYEDESIGNS.COM OR CALL 800.346.8890

2013 Office Design Contest Entry Form

All entries must be received by October 10, 2013.

PLEASE PRINT OR TYPE

Name and Title: _____

Practice Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Project Completion Date: _____

Website: _____ Email: _____

DESIGN BASICS

Contest Category: ☐ Renovation of Existing Office ☐ New Office/Expansion

Practice Size: ☐ Small (Gross Revenue < $400,000) ☐ Large (Gross Revenue > $400,000)

Estimated Total Project Cost: _____

Total Net Square Footage of Practice: _____

Entries that do not meet all requirements or are not received by the deadline of October 10, 2013 will be disqualified.

Submission of an entry constitutes consent to use the entrant's name and/or photograph, including posting on the *Review of Optometry* website and/or related print and electronic publications, without compensation unless prohibited. All photos become property of *Review of Optometry* and will not be returned. Only one entry per office will be accepted.

Entries must be composed of original, authentic, unpublished material and must be the sole property of the entrant, not previously submitted in any other contest. *Review of Optometry* is not responsible for lost, late, misdirected, incomplete, or postage-due entries. Submission of your photo gives consent for *Review of Optometry* to place the image in its image bank on a nonexclusive basis for noncommercial use.

Signature: _____ Date: _____

2013 Office Design Contest Entry Form

Questions or Concerns: Please contact Jack Persico, Editor in Chief, at jpersico@jobson.com or (610) 492-1006.

DESIGN OBJECTIVES

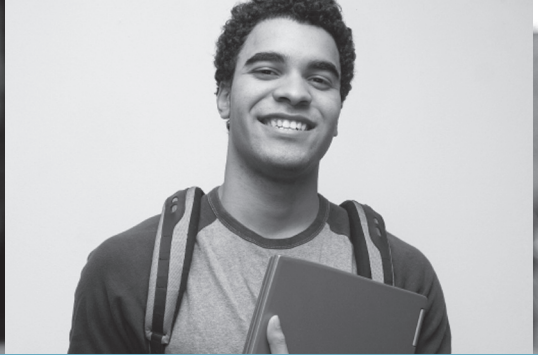
Explain how your office design incorporates these concepts and explain any obstacles you overcame. Please submit your responses to each of the following four questions, limiting each response to 150 words.

1. Function: How does your new office/remodel improve efficiency for your staff and effectiveness with your patients?

2. Optometric Equipment: How was currently installed optometric equipment integrated into the overall design of your facility? List pertinent upgrades that were made and/or additional components that will be added in the future.

3. Ergonomics: How has your new office improved the ease of providing eye care? Consider specific design decisions made regarding the layout of your business and clinical work areas (especially the exam rooms and front desk), placement of equipment and computer components, and positioning of doctor(s) and staff.

4. Aesthetics: How does the look of your new office/remodel affect or improve your staff and patient experience? How has your new office design attracted new business and/or expanded your patient base?

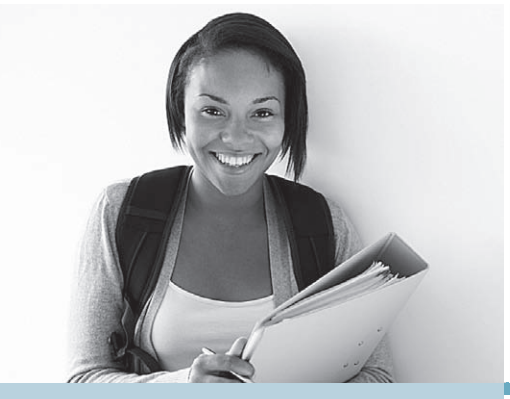




The Rick Bay Foundation

for Excellence in Eyecare Education

www.rickbayfoundation.org

Support the Education of Future Healthcare & Eyecare Professionals



About Rick

Rick Bay served as the publisher of The *Review* Group since 1991.

To those who worked for him, he was a leader whose essence was based in a fierce and boundless loyalty.

To those in the industry and the professions he served, he will be remembered for his unique array of skills and for his dedication to exceeding the expectations of his customers, making many of them fast friends.

Scholarships will be awarded to advance the education of students in both ***Optometry*** and ***Ophthalmology***, and will be chosen by their school based on qualities that embody Rick's commitment to the profession, including integrity, compassion, partnership and dedication to the greater good.

Interested in being a partner with us?

Visit www.rickbayfoundation.org

THE RICK BAY FOUNDATION
for Excellence in Eyecare Education

REVIEW® OF OPTOMETRY

Eyecare Resources Online

This service allows you to capture needed measures for two meaningful use objectives:

1) electronic transmission of patient prescriptions

2) distribution of patient-specific education materials

ECP Resources and ePrescribing from *Review of Optometry* and Healthcare Resources Online enable you to provide patient education, electronic prescribing and generate reports that allow you to attest for meaningful use incentives; however, determination of your bonus payments from CMS depends on other factors and qualifications specific to your practice.

For More Information, Visit Our OD E-Prescribing Resourses Website Page:

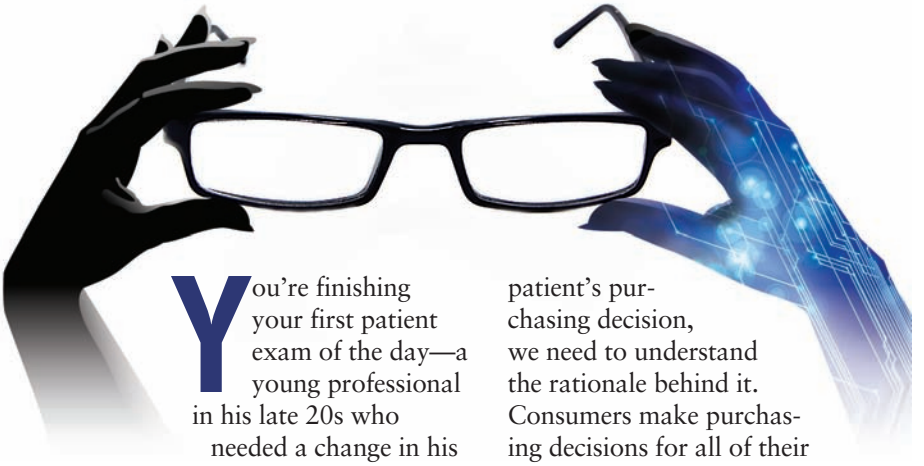
www.revoptom.com/ecp_resources_erx/

Download a QR scanner app. Launch app and hold your mobile device over the code and get ready to view our website.

Do We Stand a Chance Against Online Retailers?

More patients seem to be bypassing the optical and buying eyewear online. How do we turn the tide on these net-surfing consumers?

By Mile Brujic, OD, David Kading, OD, and Tami Hagemeyer, ABOC



You're finishing your first patient exam of the day—a young professional in his late 20s who needed a change in his prescription to optimize visual function. You discuss the lens options with him that will provide the best visual quality. An anti-reflective treatment along with a photochromic lens seems to best meet his lifestyle needs.

Additionally, he has expressed the desire for a second pair of glasses so that he has different styles to select from. He sincerely thanks you for your thorough examination and for providing him with all of the information he needs… to order the glasses from an online retailer for the best price!

Mixed Messages

Although we may be disappointed—even upset—with our patient's purchasing decision, we need to understand the rationale behind it. Consumers make purchasing decisions for all of their needs, including health care, based on perceived value. Using information they've gathered on the products or services they want, they then determine the "worth" of those products or services. (*See "Online Optical: Not as Close as You Think," on page 40.*) So, how do they decide which retailer to purchase from?

Ask yourself why so many people buy a Starbucks coffee that might cost three times as much as a coffee from another retailer, or much more than that if they make it at home. Consumers expect to see differences in cost that proportionally match the perceived quality of the product. So, quality is just as important a factor as price in the consumer's decision-making process.

But, to get back to our original dilemma: Why would our patient want to purchase his eyewear online?

Creating Commodities

Let's try to understand the factors that may be influencing this patient's decision. Via direct-to-consumer advertising, online glasses retailers are constantly sending our patients two messages:

- Their glasses are the same as what you get at traditional brick-and-mortar locations.
- Their products cost less than traditional brick-and-mortar retailers.

Online retailers are doing their best to commoditize eyewear. Commodities are essentially products that, in a consumer's mind, have few to no differences among them. Ultimately, price is the only thing that differentiates one commodity from another. So, if the patient relies on the information from the online retailer, price is then the only factor in purchasing a pair of eyeglasses. As we know, this is far from the truth—and it's based on misinformation.

2CE Credits
cope
*Cope Approval Pending

Save the Date

JOIN THE ANTERIOR SEGMENT SECTION OF THE AMERICAN ACADEMY OF OPTOMETRY FOR A CE DINNER IN SEATTLE

Thursday, October 24

MANAGEMENT OF COMPLEX ANTERIOR SEGMENT CONDITIONS

FACULTY

Moderator: David Kading, OD, FAAO

Derek Cunningham, OD, FAAO

Larry Henry, OD, FAAO

Tracy Schwartz, OD, FAAO

Space Limited! Please Arrive Early for Your CE Dinner Seat

LOCATION

Sheraton Seattle
1400 Sixth Avenue
Seattle, WA 98101

TIME

7:00pm - 7:15pm	Registration
7:15pm - 9:00pm	**Dinner** and **CE Seminar**
9:00pm	Meet and Greet the Anterior Segment Section of the American Academy of Optometry

CE TOPICS

- Introduction / Role of Inflammation and Infection in Complex Disorders
- Pharmaceutical and Ocular Surface Treatments for the Anterior Segment
- Advanced Optometric Lasers and Surgical Procedures
- The Surgical Minute: Peri-operative Care for Anterior Segment Surgery

Jointly sponsored by

REVIEW OF OPTOMETRY

AMERICAN ACADEMY of OPTOMETRY

Supported by an educational grant from

BAUSCH + LOMB

You must be registered for Academy 2013 Seattle to attend this CE Program.
To register for the AAO visit www.aaopt.org

Which is better? Despite the Internet's convenience, most consumers still prefer to shop for eyeglasses in person. It's up to you to keep providing that personal touch.

Make It Personal

We know there are variations in the quality of the frame materials, lens designs and services that we provide those who purchase eyewear from our office. But how many of our patients know about these differences?

For most of our patients, glasses have become something of a commodity because large online retailers have controlled the conversation about eyeglasses. Our young professional described in the original example believes he can get the same glasses from an online retailer at a lower price—in his mind, it's a no-brainer. So, how do we create an awareness of the differences that exist in products? How do we establish and communicate the value of the eyewear that we retail?

We need to offer them something online retailers can't—a personal experience. The patient needs to understand that they can get much more from the eye doctor's office than measurements. An accurate prescription and PD measurement are just the beginning. (*See "To PD or Not PD?" below.*) In the optical, patients not only have a multitude of frames laid out before them, they also have experts at their disposal to provide guidance, walk them through the process and explain the various options.

All patients have expectations walking into our practices, and we want their experiences to be positive. To maximize that experience, we have to do our best to exceed the patient's expectations. If we exceed expectations, we've created a positive experience. On the other hand, if we fail to meet their expectations, we've created a negative experience.

So, ensuring a positive experience by making certain we're conscious of the perceptions we're creating ultimately helps de-commoditize our services and products, and adds value as well.

To PD or Not PD?

Lately, a sensitive issue among eye care practitioners is whether to release the pupillary distance as part of the patient's spectacle prescription. Should you do it—and if you do, should you add an additional charge for it? There are several different viewpoints on this, but the first place to look for an answer is your specific state laws to find out what is legal and/or required in the state that you practice.

Some doctors charge a fee for giving a patient a PD, but then offer that as a credit if the patient purchases glasses from the practice. Others simply give the PD in good faith and with some education on the benefits of the eyewear that they dispense. We find merit to both of these options and, depending on where you work, you must decide for yourself on what is best for your patient and your practice.

Value-building Strategies

How can we do this? Here are some strategies that work:

• ***Educate yourself and your staff about the latest lens options.*** Proper patient education starts with superior office education. Be sure to include all the key players who work with patients in the optical—the prescribing optometrist, the opticians and the paraoptometrics. When everyone is up to date on the newest ophthalmic lenses and lens options, they have the product knowledge necessary to offer the options that best suit the patient. The ability to explain the difference between a lens worn for a specific job or sport vs. those worn on a daily basis builds the patient's confidence in the services we're providing and lets them know we're aware of their individual needs.

• ***Provide service with a smile and communicate with conviction.*** Phone etiquette is critical because it shapes initial patient perceptions. When anyone in the office answers the phone, it is important to "speak with a smile" and express a positive attitude for patients or potential patients. You should also apply this basic but fundamental principle to communication when the patient is in the office. Our patients receive much of their information about products through our recommendations, so it's important to speak with honesty and conviction when we make suggestions to the patient in order to build confidence and trust.

Tonometry Done Right

KAT
Keeler quality.

Pulsair Desktop
Smallest footprint and simple to use!

Purchase a Pulsair Desktop before September 30, 2013 and get a $1,300 Instant Rebate!

Intellipuff
The standard for hand held mobility.

Buy Online!
keelerusa.com

Keeler
OPTICS

Keeler Instruments, Inc. • 456 Parkway • Broomall, PA 19008 • Tel: (800) 523-5620 • Fax: (610) 353-7814 • email: keeler@keelerusa.com

• ***Establish your role in the process.*** Let patients know that you're still concerned about their care even after they leave your chair. After you complete the patient's exam, you might say something like: "We measured your prescription to a high level of precision today, and these measurements will help us ensure that your new eyeglasses provide you with the best vision possible." This conveys that there is a direct relationship between the optometrist and the optical, and that you always work together to deliver the best visual outcome for them.

• ***Ensure a smooth transfer of care.*** When you're finished with the exam, deliberately transfer the patient's care to the optician or paraoptometric who will guide them through the rest of the process. Introduce the patient to the optician and provide a brief verbal summary of the exam along with eyewear recommendations. This further shows the high level of expertise, communication and organization in your practice, and ensures that everyone is on the same page in the process.

• ***Offer high-end frames as well as options for the price-conscious shopper.*** Regardless of the price tag, the frames we display need to be fashionable, comfortable and dependable. It is always a good idea to provide a few higher-end frames to show the patients there is some exclusivity in our practice. But it's also useful to have a few lines that appeal to the bargain shopper. Some patients will remark that they want "cheap frames" when they're actually looking for value frames—it's important to educate the patient about the difference.

A cheap frame describes one that is inexpensive and of poor quality. A "value frame" is one that may be at a lower price point but has a certain level of quality that you're comfortable working with and dispensing. This distinction is a significant one, and one you should take into consideration when selecting a value line. Discuss the features that separate these glasses from the others in your office to help your patients understand the differences between lens and frame qualities as well as price.

• ***Give great follow-up.*** One area where online vendors fall short, and we shine, is great follow-up service. Be sure to let patients know that you welcome them to return for any problem or difficulty with the products you sell. Can an online vendor make a quick adjustment to the frames while the patient waits? Not likely. Right from the start, educate patients about this important distinction between your friendly optical and some faceless website.

• ***Use social media as another optical display.*** Social media provides a great venue for consumers to see your practice. It can provide an active means of staying in touch with your patients and affords another avenue to deliver information about your eyewear via posts, photos or even special events, such as frame shows.

Ultimately, the more effectively you provide an exceptional experience, the better your chances are to compete with online vendors. ■

Dr. Brujic is a partner of Premier Vision Group in northwest Ohio. Dr. Kading owns Specialty Eyecare Group, a Seattle-based practice with multiple locations. Ms. Hagemeyer is a certified optician at Premier Vision Group.

Online Optical: Not as Close As You Think

Online shopping for eyewear is still uncommon—only about 2.9% of consumers who recently purchased eyeglasses bought them over the Internet, according to the Vision Council's 2012 VisionWatch Internet Influence Report (a survey of more than 9,000 American adults on their Internet eyewear purchasing activities). That translates to approximately 1.8 to 2.0 million pairs of eyeglasses purchased online (out of 68.8 million total pairs sold during the 12-month period ending September 2012).

Indeed, only about 16% of consumers used the Internet *whatsoever* when purchasing their most recent pair of Rx eyeglasses. (By comparison, 27.1% used the Internet to some extent for shopping for Rx contact lenses.)

The VisionWatch Internet Influence Report also found that online Rx eyeglass buyers prefer to use websites operated by eyewear retailers, especially retailers that have a presence only on the web (e.g., eyebuydirect.com, framesdirect.com, coastal.com).

Indeed, most consumers avoid the Internet for spectacle shopping because they enjoy buying eyewear in person and cannot physically try on eyewear online. "For American adults who recently purchased Rx eyeglasses, the trusted relationship they have with their eye care professional or retailer was another factor that impeded their use of the Internet when recently purchasing eyeglasses," the report found.

In short, buying glasses online hasn't swept the nation yet. But by no means should you remain complacent. In fact, the number of eyewear buyers who "will possibly or probably" use the Internet to buy eyewear in the future continues to increase—some 26.1% of recent eyewear buyers indicate they will likely use the Internet to directly purchase eyewear in the future. And online consumers are happy about it. More than 90% of those who bought glasses online were satisfied—40.2% rated their online purchase experience as "good," while 51.8% rated it as "excellent."

NOT ALL MODALITIES—OR CONTACT LENSES—ARE CREATED EQUAL

BY ROY A. KLINE, OD

Dr. Kline is in group practice in Glens Falls, N.Y., where he specializes in contact lenses, ocular disease, glaucoma management, laser surgery co-management and post-op care.

There's a lot to be said about silicone hydrogel contact lenses. But viewing all silicone hydrogel contact lens modalities and brands as equals doesn't do your patients—or your practice—any favors.

THERE'S NO DOUBT THAT SILICONE hydrogel contact lenses have made a significant impact on our patients and our practices. Silicone hydrogel contact lenses provide oxygen flow to the corneal surface at levels that are impossible to achieve using traditional hydrogel contact lenses. Silicone hydrogel contact lenses also account for a full 64% of all contact lenses prescribed in the United States.[1] And that's not the only shift in fitting behavior. Monthly replacement contact lenses exceed two-week contact lenses as the most-prescribed modality in the marketplace.[1]

Early Use of Silicone

If you've been in the industry for more than a few years, you're most likely all too familiar with the challenges that were presented by early silicone contact lens materials, such as wettability and deposits. Inherently, when silicone is exposed at the contact lens surface, there's a reduction in the ability to maintain a hydrophilic, or wettable, surface and that can lead to deposits. Those of us who fit pediatric aphakic patients and true aphakic patients with silicone contact lenses in the 1980s were also plagued with constantly having to replace contact lenses due to high lipid or protein deposits and debris, which resulted in poor vision and uncomfortable lenses.

First Steps Forward

Silicone hydrogel lens technology took a giant step forward when AIR OPTIX® brand contact lenses were introduced in 2008. Thanks to the combination of high oxygen transmissibility, a biocompatible permanent plasma surface treatment and moisture retention, we now have a monthly replacement contact lens platform that truly leads to a great patient lens-wearing experience.

It's important to highlight the qualities and characteristics of the AIR OPTIX® brand contact lens material because it helps us understand why patients show such an affinity for these lenses.

- ***Permanent plasma surface.*** One only has to look at comparative contact lens studies to see how uniquely AIR OPTIX® brand contact lenses perform. AIR OPTIX® brand lenses resist up to 14 times the lipid deposition of a Biofinity^ contact lens.[2,3] When looking at ACUVUE^ OASYS^ contact lenses, studies show up to 31 times more lipid deposition at the end of the two-week recommended replacement versus an AIR OPTIX® AQUA contact lens worn for the one-month recommended replacement schedule.[2,3]

- ***Minimal impact with cosmetic use.*** In an *in vitro* study, AIR OPTIX® AQUA contact lenses were the only brand tested not significantly impacted by mascara, hand creams and makeup removers.[4] ACUVUE^OASYS^, Biofinity^ and PureVision^ 2 contact lenses had significant impacts to both diameter and base curves when exposed to makeup removers.[4] While it's always good practice to recommend that patients insert their contact lenses before applying cosmetics*, this *in vitro* testing demonstrated another potential benefit of the material properties of the AIR OPTIX® family of contact lenses.

- ***A motivating modality.*** In my experience, patients who wear monthly replacement lenses like AIR OPTIX® AQUA lenses are more compliant. Several studies support this, having found better compliance with monthly replacement contact lenses than with two-week replacement lenses.[5-7**] Also, compliant patients rate end-of-day comfort and vision significantly better than non-compliant patients.[8†] Teaming AIR OPTIX® brand contact lenses with OPTI-FREE® PureMoist® MPDS—which features HydraGlyde® Moisture Matrix—also adds one more dimension of comfort to a patient's lens-wearing experience and promotes an even more wettable, deposit-resistant surface.

Patient Feedback Says It All

AIR OPTIX® AQUA contact lenses translate to outstanding patient comfort, as reinforced by a new survey in which 9,600 patients participated.[9] AIR OPTIX® brand contact lens patients reported an average of 14.2 hours of comfortable lens wear a day, compared to 13.1 hours per day reported by ACUVUE^ OASYS^ brand contact lens patients and 12.8 hours per day reported by Biofinity^ brand contact lens patients.[10]

I often receive unsolicited testimonials from patients whom I have switched from a two-week modality to monthly replacement AIR OPTIX® brand contact lenses. At their yearly contact lens evaluations, they tell me how much more comfortable these lenses are at the end of the month and how much clearer their vision remains during their wearing cycle. What's more, the monthly replacement wearing schedule is easier for them to remember, which makes life—and compliance—that much easier.

*Refer to the contact lens brands' package inserts for cosmetic use warnings such as: eye irritation, infection, or lens damage may result if cosmetics, lotion, soap, cream, hair spray, deodorant, aerosol products or foreign particles come in contact with lens. **Compliance with manufacturer-recommended replacement frequency. †Compliance with the manufacturer-recommended replacement frequency; based on subjective ratings at end of day and when lenses need replacing, in a survey of 1,389 silicone hydrogel contact lens wearers. ^Trademarks are the property of their respective owners.

Important information for AIR OPTIX® AQUA (lotrafilcon B) contact lenses: For daily wear or extended wear up to 6 nights for near/far-sightedness. Risk of serious eye problems (i.e., corneal ulcer) is greater for extended wear. In rare cases, loss of vision may result. Side effects like discomfort, mild burning or stinging may occur.

References: 1. Third party industry report, 12 months ending October 2012; Alcon data on file. **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 and disinfection; significance demonstrated at the 0.05 level; Alcon data on file, 2008. **4.** Luensmann D, Srinivasan S, Yu M, Yang J, Jones L. The impact of cosmetics on the physical dimension and optical performance of silicone hydrogel contact lenses. Contact Lens & Ant Eye. 2012;35S:e6. **5.** Yeung K, Forister J, Forister E, 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. **6.** Dumbleton K, Woods C, 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. **7.** Jones L, Dumbleton K, Fonn D, et al. Comfort and compliance with frequent replacement soft contact lenses. Optom Vis Sci. 2002;79(12s):259. **8.** 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. **9.** Alcon data on file, 2012. **10.** In a survey of 2,224 AIR OPTIX® AQUA, 2,815 ACUVUE® OASYS® brand and 1,063 Biofinity® brand contact lens wearers based on self-reported comfortable hours of contact lens wear, p<.001; Alcon data on file, 2012.

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

Rx only

Alcon®

a Novartis company

Prescribe Sunwear From Your Chair

Be sure patients know that sunglasses aren't just a fashion choice. Sunwear is necessary protection against the dangers of UV radiation. Education and options start with you. **By Justin Bazan, OD**

Think about what it feels like to be outside, enjoying a sunny summer day. You can feel the warmth of the sun on your face. You're enjoying the beautiful scenery and hopefully you have your shades on. The sun—although 93 million miles away—makes its presence known with thermal energy and visible light.

However, it's the unseen ultraviolet radiation (UVR) that's the problem.

Most people are aware of the dangers of sun exposure to their skin and take appropriate precautions, such as using sunscreen. But most people don't take the same precautions to protect their eyes from UVR. A 2013 Vision Council observational study revealed that 40% of adults don't wear sunglasses while outside—an abysmal statistic on such a major ocular issue with easy-to-implement solutions.[1]

Unfortunately, this is probably due to inadequate patient education and lack of emphasis on taking action. But the most influential person, and the one with the biggest opportunity to help, is you, their eye doctor. For our patients to practice what we preach about UVR protection, we first must preach—louder and more often.

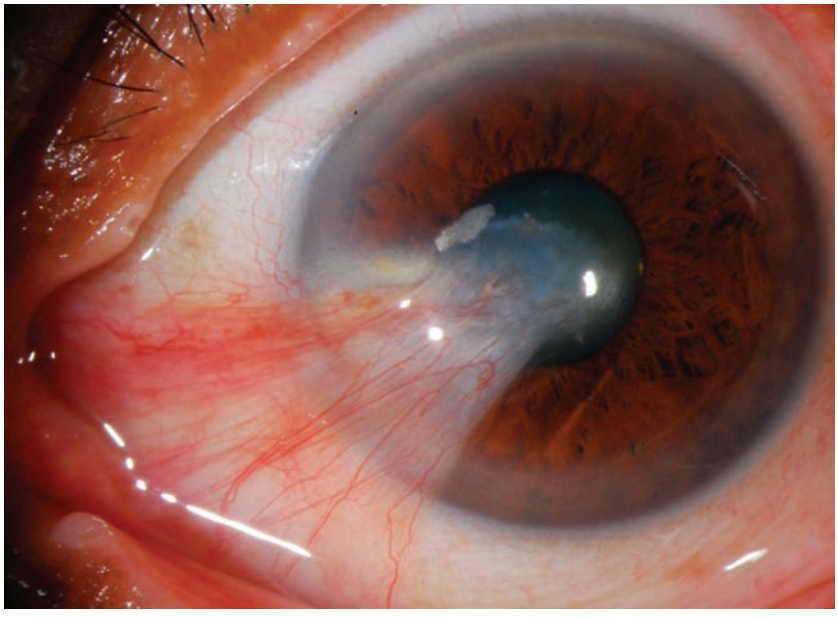


Photo: José Miguel Varas, MD/Wikimedia Commons

Show the patient a close-up look at what UV can do their eye—such as this one with pterygium. It drives the point home that they must wear their sunglasses.

Show and Tell

During the exam, be a UV-educating chatterbox. We know UVR affects nearly every part of the eye, but patients don't know this. It's up to us to tell them—and show them. (*See "'Sunglass Tie' = Fashion + Function," page 46.*)

Here is a simple formula that has been proven (in my practice) to educate patients:

AMETEK®
ULTRA PRECISION TECHNOLOGIES

We hope your dispensary can keep up.

Ready for a faster-running practice? Hop on Reichert's **Auto Phoroptor RS®**. It's quick, quiet, and smart. EMR connectivity eliminates manual data entry, and potential mistakes. Doctor-friendly ergonomics keep you comfortable and fleet of foot. Speed matters to your patients and your bottom line. Try out the Auto Phoroptor RS, and "stock up the dispensary," we say! Call 1.888.849.8955, or visit **www.reichert.com/autophoroptor**

Another bright idea from Buffalo.

Reichert®
TECHNOLOGIES
Advancing Eye Care. Preserving Sight.™

Vision Expo Booth #MS 9043

@ReichertTech

UV Conditions Patients Should Know About

UVR can cause damage in a number of eye-related areas. Patients need to understand the following susceptible areas and conditions, and have the desire to take preventable action against them.

- **Periocular skin**. Dynamic canthal lateral wrinkles, skin cancers
- **Ocular surface**. Pinguecula (*pictured here*), pterygium, photokeratitis/conjunctivitis
- **Crystalline lens**. Cataract
- **Retina**. Macular degeneration

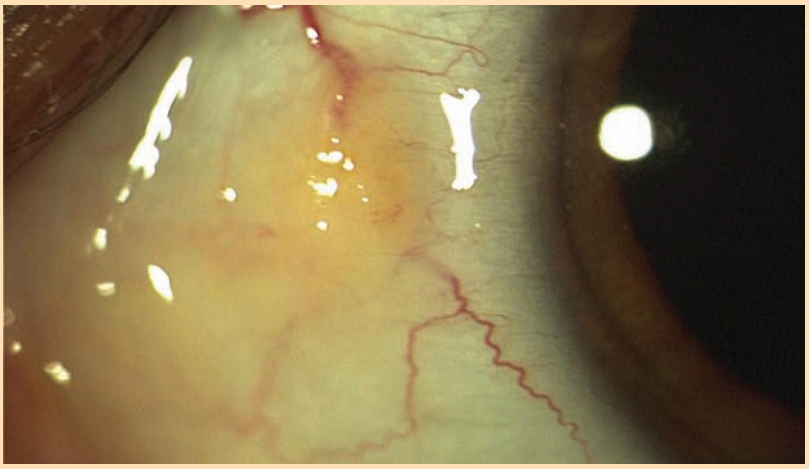


Photo: Wikimedia Commons

1. Describe what you're looking for.
2. Show what you found.
3. Explain why it's happening.
4. Inspire action.
5. Ask if they understand and agree to take action.

While performing the slit lamp examination, use the following script to help educate the patient and to inspire them to protect their eyes from UVR damage and the consequences associated with it.

Let's take the common pinguecula as an example.

1. Describe What You're Looking For

"I'm taking a close look at the surface of your eye. The powerful UV rays from the sun can often cause serious damage to it. I've found some damage to your eye that we need to talk about now."

2. Show What You Found

If you see something, show them.

Showing patients images—whether you use your own imaging system or simply pull up the image on Google—helps drive the point home.

Showing patients a close-up look at their eyes—or what their eyes could look like if they continue not to wear shades—is very persuasive. It often evokes a powerful emotional response that can contribute to solidifying their understanding, leading to them taking action and wearing shades.

Using an exam lane computer, a laptop or an iPad, simply do a Google Image search for "pinguecula," for example. You'll see a variety of pingueculae images that range from mild to severe, which will aid you in the education process.

3. Explain Why it's Happening

Keep your scientific knowledge on a general level to ensure the patient obtains the basic comprehension. You can always get into "p53 tumor suppressor gene expression" and "elastogenesis" afterwards, if the patient expresses interest in more advanced knowledge.

Show them a pinguecula that is similar to theirs, then explain: "Most of the light passes through the front of your eye and ends up being focused on the back of your eye, which allows you to see. However, some of the light ends up being focused into this area. That light contains harmful ultraviolet radiation, which causes damage to the surface of your eye. Have you ever looked in the mirror and noticed this yellowish area on the white of your eye? This is called a pinguecula, also known as a sun spot. It's not a big deal right now, but it will be if you don't help to protect it from the sun and

Prepare for Sunwear Before the Appointment

To ensure that a patient develops and maintains an interest in wearing sunglasses, UVR awareness must start even before he or she arrives for an exam and continue well after the individual has left the office. Appropriately preparing the patient for his or her visit, using your staff as educators and providing supplemental online content are all necessary to help maximize awareness and compliance.

So, at the time of booking, be sure that patients are instructed to bring the glasses and sunglasses they wear most, as well as their contact lens Rx. This simple request underscores the fundamental importance of sunwear in the ultimate goal of appropriate UVR protection.

THREE RIVERS OPTICAL

OUR SPECS MEET YOUR SPECS

COMMITMENT

PERSONAL SERVICE

INDEPENDENCE

PRODUCT QUALITY

Three Rivers Optical produces the best lab quality, period. We know that your reputation rides on how well we do our job, and we won't disappoint you. Across all lens designs, materials and designs, we are dedicated to optimizing the optics and cosmetics of the final product that you dispense to your patient.

And our See-More line of products gives you the option of the very best value in each major lens category. Does this sound like the product quality you want?

Call Steve Seibert, Three Rivers Optical CEO, for more information. And stop worrying.

SEE MORE

1-800-756-2020

www.3riversoptical.com

other environmental conditions like the wind."

4. Inspire Action

The next challenge is convincing them to want to take action *now*.

How? Show them moderate and severe pingueculae, and explain: "If you continue not to wear your shades while outside, the chances of it getting worse are extremely high. When it gets to this point, not only is it extremely unsightly, it is extremely uncomfortable. Nobody wants to have red, irritated, uncomfortable eyes all the time. They really become a problem and treatment is often ineffective, so the best thing you can do is to slow down the progression and help to ensure it never gets to that point. Are you going to be able to keep your eyes healthy by wearing your sunglasses more often, and not just on sunny summer days, but all throughout the year?"

5. Ask if They Understand and Agree to Take Action

5. Wait for confirmation that they will do the best they can at preventing future damage, and then ask if they have any questions. If not, move on to the next discussion point and apply the same formula.

Remind them that it's pretty easy to protect against UVR. Limit sun exposure and, in addition to sunglasses, use other forms of protection such as wide-brimmed hats.

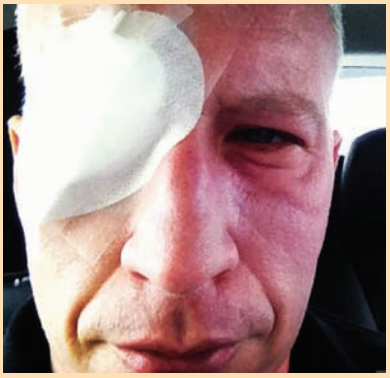
Contacts that are designed to help block UVR can also play a significant role in protecting their eyes. They can block 90% or more of UVA/B from reaching the cornea and structures located posterior to it. They are an excellent idea for those forgetful types, and provide an added layer of protection from UVR damage that may still be occurring even with protective eyewear, due to reflected UV and UV that is entering from the sides of the eyewear.

Develop a short but meaningful quote that you can deliver at the summary of the exam: "Your eyes are healthy. The most important thing you can do to keep them that way is to see me annually and make sure to wear your shades. As you now know, the sun is one of the most damaging things to our eyes. Its effects are cumulative, so being better about wearing them now will ensure that your eyes are as healthy as can be down the line."

From Chair to Sunwear

At the conclusion of the exam, you have an excellent opportunity to hand off a primed patient to the optician, who can help them

'Share' Your Content



Use social media to educate patients. Anderson Cooper's recent "sun blindness" was a great conversation starter.

Social media allows us to engage our patients outside of the office. We can have important conversations with them on Facebook, Twitter and newly emerging social media platforms.

Keep an eye out for opportunities that provide good subject matter for a post. Celebrities who capture the attention of your patients provide eye-catching material for you to use. One excellent recent example: Anderson Cooper's bout with photokeratitis. There were many online articles, interviews and video clips that all lent themselves as fodder for education and outreach through social media.

'Sunglass Tie' = Fashion + Function

No longer do I wear the standard garb of a clinician. I've swapped out one piece of the usual optometrist's outfit with a patient education tool: My traditional tie has been replaced with a pair of sunglasses.

It's a simple, yet highly effective, way to engage my patients in a conversation about UVR. It helps to serve as a reminder to ask about their sunwear habits. It gives me an opportunity to back up what I'm saying. It's easy to just to grab them and say: "I have mine, do you have yours?"

The custom-branded pair I choose to wear in the office is very inexpensive, yet 100% UV blocking. If a patient doesn't own a pair of sunglasses, it will become their pair before they leave.

Hopefully, the "sunglass tie" is a fashion trend that will soon sweep optometry.

Justin Bazan, OD, makes a real fashion statement: "Wear your sunglasses!"

Correct the vision rather than mask the problem.

KeraSoft® IC

Treating irregular corneas with anterior aspheric optics.

For keratoconus and other corneal irregularities, KeraSoft® IC provides vision correction by using anterior aspheric optics, and "drapes" over the cornea rather than using thickness of material to "mask" the irregularity. The patented design is customizable and offers balanced overall thickness with spherical aberration control. It features an adjustable periphery, allowing the lens to fit most any corneal shape. Made of silicone hydrogel* and with a Dk of 60, KeraSoft® IC soft contact lenses provide a comfortable option for your patients with irregular corneas.

Only available from your authorized KeraSoft® IC laboratories. Visit kerasoftic.com for details.

KERASOFT® IC

ONLY FROM AUTHORIZED LABORATORIES

BAUSCH + LOMB

Put Your UV Meter to Work for You

There is a piece of equipment, invaluable in UV education, that many offices have, yet is often covered under a layer of dust and tucked into a dark, out-of-the-way cabinet: The UV meter.

Go and get it out of storage right now.

Few things are as impactful as showing a patient that their sunglasses are not adequately keeping their eyes protected. It gives us a chance to talk to them that it is not so much about how much they paid for their shades, but more about if they bought a reputable brand from a reputable dealer.

Move the UV meter out of the lab dungeon and place it in a highly visible location up front, preferably in earshot of other patients. Conduct the UV testing of their eyewear in front of them. Patients are amazed and impressed. They are a captive and engaged audience for your tech to educate them on UV protection.

Instruct your patients to bring their sunglasses to the exams. Then put those shades to the test. Many patients will be surprised at the level of UV protection their sunglasses provide—or don't provide.

The biggest opportunity here is to educate the patient that all eyewear should be "sunglasses," meaning that even clear lenses should be protecting their eyes from UVR. It is all too common for a patient's habitual pair to provide them with less-than-adequate protection.

Our office has made a pledge to Rx only lenses that inherently block UVR. We no longer sell lenses made of materials that need to be coated to protect eyes from UVR. We have seen too many lenses that either were never coated with UV protection or in which it has worn off. CR39 is no longer an option in our office.

The safest approach is to use a material, like polycarbonate, that inherently provides adequate UV protection.

Because of the thorough patient education about UVR, most patients in our practice express a desire for UV protection. For a more complete level of UV protection, lenses are also treated to minimize the reflected UV that bounces of the backside of the lens and into their eyes.

When presented as part of the features of their new lenses, their understanding affords them a better appreciation of this benefit.

get the protective eyewear that they now want: "We discussed UV protection and we agree that it's extremely important. Please make sure he is fully protected in both his new glasses and sunglasses."

After the solid in-office education you've provided, the patient is now more open and ready for the purchase of sunwear. Be sure to have a selection of shades in the dispensary to take advantage of the patient's interest.

Start Sunwear Early

Children are usually spend more time outside than adults, so their risk of UVR is often greater. And even highly educated parents may believe that UVR damage occurs later in life, and fail to understand that it is the cumulative effect on the eyes, which begins early in life. Be sure to explain that parents themselves should set a good example by wearing sunglasses.

Fortunately, educating the parents is usually the easy part. Once they realize the risk their children are exposed to, they often take action. Offering reasonably priced sunglasses provides an answer to the often-heard objection: "I'm not spending a lot on a pair they will break or lose the first day they wear them."

Forming the habit of wearing sunglasses early is helpful in establishing it as a lifelong pattern. Take an active role in achieving sunwear success in children by making the commonly practiced after-exam reward a pair of custom-branded shades. You'll soon recoup the small financial outlay for the pair because you have now converted them into a sunglass wearer who most likely will purchase another pair in the future.

Most importantly, you are laying the foundation for a lifetime of UV protection. ■

Dr. Bazan is in private practice in Brooklyn, NY. He lectures frequently on social media and refractive eye care.

1. The Vision Council. The Big Picture: Eye Protection is Always in Season. May 2013. Available at: www.thevisioncouncil.org/consumers//media/PDFs/VCUVReport2013FINAL.PDF. Accessed August 16, 2013.

Visit Us At Vision Expo West Booth MS7059

VEATCH
OPHTHALMIC INSTRUMENTS
25 YEARS OF EXCELLENCE

A Company with an Eye for Good Service

WE ARE ON A ROLL!

25 years as your trusted equipment source

WWW.VOI2020.COM
888.959.5173

Digital Imaging | Exam Lanes | Consulting | Services | Supplies

Children's Optical:
Little Tykes, Large Opportunity

Selling children's eyewear can be a profitable niche business—but you have to think differently. Here's what one optometrist learned while building a successful children's optical in her practice. **By Lorraine Labiento Smith, OD, and Matthew Smith**

A few years ago, I decided to go solo and open a new practice. However, our small town already had both a well-known optician and a national chain. These businesses were established, while I was starting from scratch and on a budget. How could I compete?

Rather than opposing them head-on, I decided to look for a niche. Our town is an outer suburb of Boston that is very popular with families. Looking around, I saw many other businesses—doctors, dentists, salons and clothing stores—that had achieved success by catering to the children's market.

Selling kids glasses may seem like an afterthought, but it can be a profit center. Dr. Lorraine Labiento Smith (pictured here with patient Emily) has turned it into a nice niche business.

I found out that nearly one-third of our residents (32.5%) are under age 18. Moreover, we are surrounded by other family-oriented communities. I was convinced that all these children represented an opportunity for my eye care practice.

Building a Better Option

In researching the market, I found few options for children's eye care. Most eye care professionals provide a one-size-fits-all experience. However, they really aren't very family friendly. Their stores—full of fragile frames and sharp corners—aren't designed to be comfortable for parents with small kids. And their selection of children's frames leaves a lot to be desired.

I decided that my niche would be the opposite: An optical designed to make families feel comfortable, with a wide selection of fashionable children's eyewear that both kids and their parents would love.

From our humble beginnings, we've grown beyond my expectations. Today, patients come to us from more than 40 surrounding towns, and we enjoy very high rates of customer loyalty and referrals. As our profits have grown, we've reinvested back in the practice—expanding our selection of frames, investing in new, state-of-the-art equipment, and buying and remodeling a building for our newly expanded optical.

Crizal® Prevencia™ and the Blue Light Hazard

Blue light plays a paradoxical role in health and vision. Not only is blue light essential for color perception, recent research has found that light in this band triggers critical physiological responses that include pupil constriction reflex and synchronization of the human biological clock. However, blue light may also be damaging to the eye, and the term "blue light hazard" has been coined to describe the danger this light presents to critical structures within the eye. Blue light can induce formation of damaging phototoxins, leading first to the death of critical retinal pigment epithelium (RPE) cells and then to photoreceptors. This damage is cumulative, and has been implicated in the development of retinal degenerative diseases such as age-related macular degeneration (AMD). The fact that blue light is both beneficial and harmful raises a critical question: Can we protect the eye from harmful blue light without simultaneously denying it the beneficial blue light? One way to accomplish this would be the creation of a lens that would selectively filter out the harmful wavelengths while transmitting the beneficial ones.

To determine if specific bands within the blue light spectrum were responsible for blue light's phototoxic effects, researchers from Essilor's Paris R&D laboratories joined forces with scientists from the Paris Vision Institute - one of the most important research centers in Europe on eye diseases—to develop a unique illumination system that allowed cultured swine retinal cells to be exposed to narrow bands of light. Using this test system, it was discovered that RPE phototoxicity was concentrated in a relatively narrow band, separate from the wavelengths necessary for the beneficial physiological effects of blue light. This finding paved the way for **selective photofiltration**: the creation of lenses that reduce the level of exposure to the harmful portion of the blue light spectrum, ranging from 415-455 nanometers (known as Blue-Violet light) while permitting the rest of the visible spectrum including beneficial blue light (known as Blue-Turquoise light), to enter the eye at a normal level. Thus, the eye's necessary visual and non-visual functions can be maintained while exposure to hazardous wavelengths is reduced.

Light scan™

COVERED BY ONE OR MORE PATENTS

Crizal® Prevencia™ No-Glare lenses with Light Scan™ represent the first application of new patented technology[1], that enables selective filtration of harmful light – both Blue-Violet (BV) and Ultraviolet (UV) – while allowing beneficial light to pass through and maintaining exceptional transparency at all other visible-light wavelengths. In fact, Crizal Prevencia No-Glare lenses reduce the quantity of harmful Blue-Violet light reaching the eye by 20%. Unlike common yellow-tinted "blue blocking lenses," Crizal Prevencia No-Glare lenses cause minimal color distortion—indeed, these lenses are almost perfectly clear. Designed to selectively block harmful blue light while preserving transmittance of beneficial blue light, Crizal Prevencia No-Glare lenses offer the most selective eye protection on the market today.

Additionally, Crizal Prevencia No-Glare lenses also feature an Eye-Sun Protection Factor (E-SPF®) of 25, which means they provide 25 times more UV protection for the eye than wearing no lens at all. Integrating Essilor's superior No-Glare technology, Crizal® lenses are easy to clean, resistant to smudges, scratches, dust, and water, and protect against distracting glare and reflections. Maintaining excellent transparency, Crizal Prevencia No-Glare lenses offer optimal vision at all times.

INSTITUT DE LA VISION PARIS

UPMC SORBONNE UNIVERSITÉS

1. Covered under U.S. Patent No. 8,360,574. Additional U.S. and foreign patents pending.

Our success should not be an isolated story. According to the 2010 Census, there are 82 million children under the age of 18 in the US—more than a quarter of the total population. And, the World Health Organization estimates that between 5% and 15% of children have a refractive error. So, I'm convinced there's an opportunity to create profitable children's opticals in many other communities. However, in order to take advantage of this opportunity, optometrists will need to think differently about their practices.

Locate the children's waiting area away from the optical—but make it fresh, bright and fun.

Here are the most important lessons I learned from building a children's optical in my practice:

Find a Family Community

The single most important factor in creating a successful children's optical is to find the right community. If you're going to serve kids, you should be in a market where lots of kids live. Not only does this give you a patient base to serve, it also provides you with a network of professionals and organizations that can provide referrals, be involved in collaborative marketing and publicity opportunities, and offer general support and advice to help grow your practice.

How do you find the right community? Start by looking for highly-ranked school districts. Strong school systems tend to attract families that are committed to investing in their children's well being.

Also, look for complementary businesses that serve children, such as pediatricians, pediatric dentists, dance studios, children's salons and clothing stores. If others make a nice living serving families with children, that's a good sign that you can, too.

Market to Moms

Having a children's optical is different from a normal, retail optical because many prospective customers don't realize that they need you. Even if you have a prime retail location, many parents will never bring their kids in the door because they don't consider going to the eye doctor as a part of their children's health routine.

Instead, parents learn they might need your services through school screenings, pediatrician visits, educational outreach and word of mouth. Then, they research options on the Internet.

When we were opening, I didn't have the budget for a prime location. So, I started off with an inexpensive office on the second floor of a professional building. I didn't even have a street sign. To compensate, I spent a lot of time building relationships with pediatricians, school nurses, ophthalmologists and community organizations. Many of my patients come from these professional referrals. In addition to referrals, I advertise, have a website and am listed in insurance directories.

Always remember this: You may be serving kids, but moms make the decisions. So your marketing should really target moms rather than children. And remember, parents have jobs and need flexible office hours. The peak times for kids are weekday afternoons from 3 to 6 o'clock.

Be Visible Online

Whether the patients came through referrals, advertising or insurance company provider directories, they almost all have something in common: they research on the Internet before choosing a doctor or optical. For this reason, our website has been the most important factor in attracting new patients.

Our site is not fancy, and was actually very inexpensive to develop. However, it does two things very well:

First, it gets us found on search engines, so that when someone searches for terms like "children's glasses" or "pediatric optical" in our local area, we come out at the top or near the top of the rankings.

Second, it provides patients with the medical and optical information they need in order to evaluate and trust us.

Design a Family-Friendly Optical

It's very helpful to actually be a parent before going into this niche. After I became a parent of young children, my perspective on opticals changed dramatically. I no longer focused solely on the beautiful fixtures and frames. In designing my optical, I tried to make it family friendly, while still preserving the aesthetics and merchandising of a good retail setting.

This starts with the waiting area. I placed the waiting area away from the optical so they cannot grab the eyeglasses—a big cause of parental stress. All of our outlets have safety

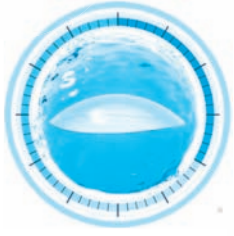
THIS IS WHY YOU CAN give your patients comfort that lasts.

ATTACHING AND
FORMING A HYDROPHILIC ENVIRONMENT
across the surface of the lens[1,2,4]

Proprietary HydraGlyde®
Moisture Matrix

CREATING A UNIQUE BARRIER
that reduces lipid deposition
and removes protein deposits[1-3]

PROVIDING MOISTURE
from morning till night[1,2,4]



OPTI-FREE® PureMoist® MPDS with HydraGlyde® Moisture Matrix

TALK TO YOUR PATIENTS ABOUT THE BENEFITS OF **OPTI-FREE®** BRAND PRODUCTS.
LEARN MORE AT **MYALCON.COM**

REFERENCES:
1. Data on file, Alcon Research Ltd. **2.** Lally J, Ketelson H, Borazjani R, et al. A new lens care solution provides moisture and comfort with today's CLs. *Optician* 4/1/2011, Vol 241 Issue 6296, 42 -46. **3.** Campbell R, Kame G, Leach N, et al. Clinical benefits of a new multi-purpose disinfecting solution in silicone hydrogel and soft contact lens users. *Eye & Contact Lens* 2012:38(2);93-101. **4.** Davis J, Ketelson HA, Shows A, Meadows DL. A lens care solution designed for wetting silicone hydrogel materials. Poster presented at: ARVO; May 2010; Fort Lauderdale, FL.

Alcon®
a Novartis company

covers. I minimized sharp corners, pinch points and tempting fragile things that kids might grab and break.

I tried to make it an area in which kids wouldn't mind waiting. There is age-appropriate entertainment (origami for the older kids), some kid-sized furniture and the never failing fish tank.

Finally, I worked with my fixture design company and frame reps to merchandise the frames. We came up with a variety of fun displays for different categories—tweens, tots, sports and sunglasses. We also tried to give them a "kid feel" while still offering fashion and quality.

Pick the Right Frames

How do you get started? Here is a crash course. The pediatric market is divided into three distinct groups: ages zero to three, three to seven, and eight to 14. I originally started with about five different frame styles for each gender in each category, and expanded as I grew.

• *0 to 3.* For babies and toddlers, basic durable eyeglasses are sold in kits of six to eight different frame styles and color samples. The two categories are the nylon one-piece designs and the semi-custom metal frames (e.g., Fisher Price). With these kits, the optician has a lot of control over the frame front, nose bridge and temple design, and the parent chooses the color palette.

• *3 to 6.* In buying frames for this age group, it's important that they are well made and come with a good warranty. I look for smaller manufacturers because the quality is better and they don't market TV icons. Kids like to choose their favorite colors, so offer bright colors with cute details. Instead of stocking a huge inventory, keep some specialty catalogs on hand.

Fun frame boards appeal to kids—but still offer fashion and quality to win over parents.

• *8 to 14.* Pre-teens: need I say more? Actually, this is a very fun group and I have the largest selection in this area. Tweens have very definite opinions about style and trends. Our job is to provide direction in appropriate fit and use of the prescription.

Important note: Pick contemporary styles and choose a single manufacturer's complete line. It is simpler, more cost effective and easier to market. Even if you only carry one line, make sure there are multiple size and color options available. My number one line is Ocean Pacific. They target tweens to young adults, are well made, trendy, have many size and color options, and have a good exchange policy.

Because children's needs vary, I prefer to custom order the correct sizes and colors as needed rather than stock excessive inventory. The parents will recognize the extra effort and their loyalty is ensured. Be sure to provide protective eyewear and sunglass options that are prescription ready. Offer a reasonable sunglass package and you will easily sell multiple pairs.

Before you sell, educate! Discuss the prescription, frame benefits, warranties and wearing schedule. My practice is 98% premium anti-glare. It is an easy up-sell and I believe it's important to the success of the prescription. Why premium? Kids are messy and always have smudged lenses. These lenses are easier to clean and have stronger scratch-resistant coating. Parents rarely turn down this option.

To succeed in the cost-driven competitive optical business, doctors need to find opportunities to provide unique services to their patients. A pediatric section added to an adult optical can provide such an opportunity. A small investment caring for an underserved population will increase patient numbers and lead to increased optical and medical profits. Plus, it's a lot of fun! ■

Dr. Labiento Smith is a former staff optometrist at Massachusetts Eye and Ear Infirmary, and now practices in Sudbury, Mass. Mr. Smith is the practice's VP of marketing.

Petite Frames Aren't Just for Children

As I began selling children's frames, I noticed something unexpected: Moms kept trying on the frames. The tweens frames fit petite women perfectly! Because I was already marketing to moms, I took advantage of this unique niche. So, in addition to children's eye wear, I now market my optical for petite women.

I have a nice following and when I sell to a petite woman, it's always a multi-pair sale. When I attend trade shows, I look for frames with small eye sizes in mature colors and higher-end design for this small (that is, petite!) population.

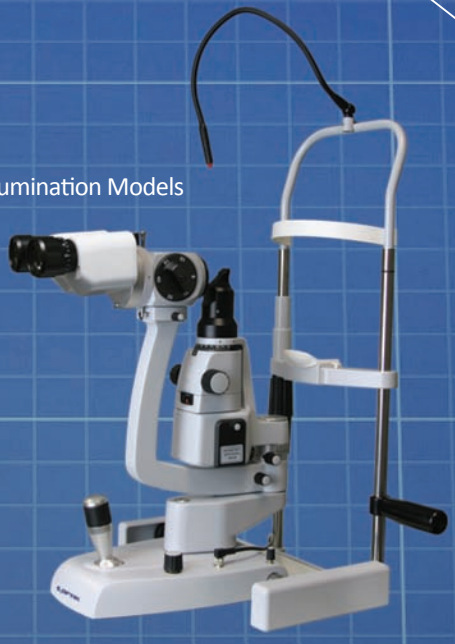
ANATOMY OF A GREAT EXAM LANE

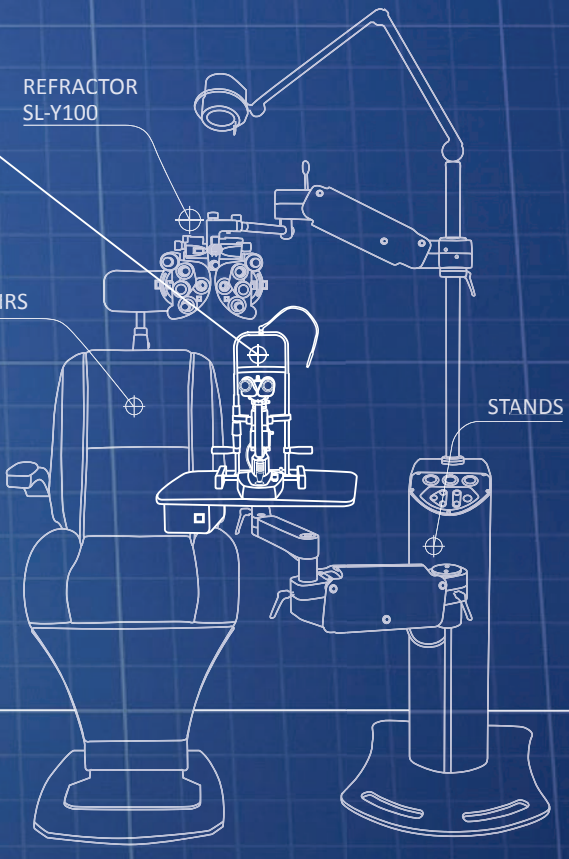
Quality or Value - go ahead you can have both

S4OPTIK products are the perfect blend of extraordinary Value and Quality. Instruments which satisfy even the most discerning practitioner.

H + Z SERIES SLIT LAMPS

Z-SERIES
Compact Illumination Models





H-SERIES
Vertical Illumination Models

SLIT LAMP FEATURES

- Multilayered anti-reflective coatings
- Stunning optical quality allowing clear visualization and depth of field
- 20% increase in optical transmission
- 10% increase to the depth of field

www.s4optik.com | info@s4optik.com

RIGHTMED S4OPTIK

5325 Cleveland Street, Suite 303.
Virginia Beach, VA 23462
T: 1.888.224.6012 I www.s4optik.com

TECHNOLOGY VALUE RELIABILITY

SUBTRACT LENS DRYNESS.
ADD NEW PATIENTS.

You and Sally

ACUVUE®
OASYS®
BRAND CONTACT LENSES
WITH HYDRACLEAR®PLUS

"I never experience dryness." That's what more of your ACUVUE® OASYS® Brand patients said in a clinical study: at least 67% more than those wearing Biofinity® or AIR OPTIX® AQUA. No wonder that on average your ACUVUE® OASYS® patients have already told 6.5 people about you. Grow your practice. Fit more ACUVUE® OASYS®.

ACUVUEprofessional.com

*44% of ACUVUE® OASYS® and 25% of Biofinity® patients reported never experiencing dryness after 2 weeks' wear, and in a separate study, 40% of ACUVUE® OASYS® and 24% of AIR OPTIX® AQUA patients reported never experiencing dryness after 2 weeks' wear.

ACUVUE® Brand Contact Lenses are indicated for vision correction. As with any contact lens, eye problems, including corneal ulcers, can develop. Some wearers may experience mild irritation, itching or discomfort. Lenses should not be prescribed if patients have any eye infection, or experience eye discomfort, excessive tearing, vision changes, redness or other eye problems. Consult the package insert for complete information. Complete information is also available from VISTAKON® Division of Johnson & Johnson Vision Care, Inc., by calling 1-800-843-2020 or by visiting acuvueprofessional.com.

Sally

Sally's Yoga Instructor

Sally's Dentist

Sally's Electrician

Sally's Hairstylist

Sally's Co-worker

Sally's Niece

Sally's Mechanic

Sally's Brother

Sally's Teacher

Sally's Banker

Sally's Neighbor

Sally's Grocery Cler

Sally's Manicurist

The Lost Arts of Optometry, Part Two

Put the 'Fun' Back in Funduscopy

These tricks of the trade will help hone and perfect your approach to fundus evaluation.

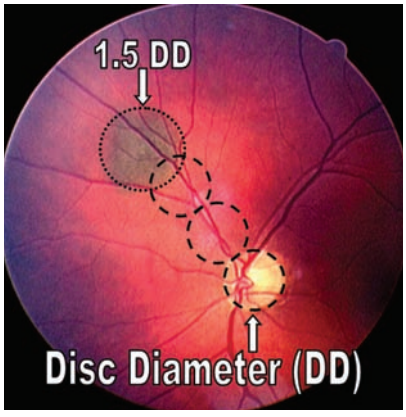
By Philip E. Walling, OD, and Amy Dinardo, OD, MBA

Part one of the "Lost Arts" series detailed the intricacies of binocular indirect ophthalmoscopy and provided tips for scleral depression (see "A Refresher on Scleral Depression," August 2013). *This installment focuses on a skill that many optometrists perform on a routine basis—fundus biomicroscopy.*

A dilated fundus examination with slit-lamp biomicroscopy is essential to a complete stereoscopic health evaluation of the optic nerve, macula, vitreous and retina. But do you remember the "tricks of the trade" that experts use to maximize performance? Here are six tips to improve your examination skills.

1. Use Your Tools Effectively

Many optometrists have a favorite fundus biomicroscopy lens for general applications. Just keep in mind, depending upon the condition being examined, you can select from a variety of lenses that can be used in concert to maximize your view of the patient's retina.



1. Be sure to use disc diameters when determining the size and location of retinal lesions.

For example, the optic nerve and macula are best examined through a low-dioptric (60D) biomicroscopy lens. These low-powered lenses permit greater magnification without requiring the examiner to use the high mag of the biomicroscope, which can yield a slightly hazy view due to diffraction. Additionally, with such high magnification, the examiner can acquire a clear, detailed view of the neuroretinal rim tissue. This is essential in the diagnosis and management of glaucoma, or when visualizing neovascularization of the disc.

Further, a detailed view of the macula is essential when observing the internal limiting membrane, identifying a subtle epiretinal membrane or examining for retinal pigment epithelium (RPE) changes indicative of early macular disease.

Any biconvex fundus biomicroscopy lens produces an inverted image. Anatomically, the optic nerve appears nasal to the fovea. When viewing through a biconvex fundus lens, the optic nerve looks to be temporal to the nerve and the superior retina appears inferiorly. At first, it is easy to forget this principle; however, it is absolutely essential to record a lesion's correct location. For example, when observing the area near the first arterial bifurcation through a biomicroscopy lens, any lesion that

800.735.0357
haag-streit-usa.com

LEGENDARY IS MATERIALISTIC

14-ply birch. Forged iron. Tough, hand-sewn upholstery. These are the materials of a legend. Built into our ultra-durable exam chairs and stands to make them last for decades. And they're virtually maintenance free.

Call us materialistic. We're okay with that. Because it's what makes Reliance Medical Products Brutishly Durable Since 1898.

Find your legendary exam chair and instrument stand at **reliance-medical.com**, or call 800.735.0357.

The Superior Practice.

RELIANCE INTERNATIONAL

Viewing Peripheral Retinal Lesions with Non-contact Fundus Lenses

1. Instruct the patient to look in the lesion's direction.
2. Place the lens over the relocated pupil.
3. Pull the slit lamp almost all the way back toward yourself, then center the slit beam over the pupil.
4. Place the lens in front of the pupil, look through the oculars, and move the slit lamp toward the patient in the direction of the red reflex.
5. Once the fundus is in focus, move the slit lamp in the opposite direction of the lesion.

(Note: The lens causes the image to appear inverted.)

appears in the superior portion of the view actually is located inferiorly in the eye. As such, the entity should be documented accordingly in the medical record.

After performing binocular indirect ophthalmoscopy (BIO), it may be useful to examine a peripheral retinal lesion in more detail via slit-lamp biomicroscopy. Peripheral fundus lesions are seen well with a high-powered, non-contact lens such as a 90D SuperField (Volk Optical) or an Ocular MaxField Standard 90D (Ocular Instruments). These lenses allow the examiner to observe questionable retinal lesions in greater detail than with BIO alone. The combined views from BIO (with or without scleral depression) and the peripheral non-contact biomicroscopy lens likely yield all the required information necessary to make a specific diagnosis.

To view the peripheral retinal lesion with the slit lamp, instruct the patient to look in the direction of the lesion. Once the lesion is visualized with the fundus lens of your choice, move the slit lamp away from the area to be examined. For example, a lesion located at 12 o'clock can be seen by asking the patient to look straight up. When the biomicroscopy lens is centered over the pupil and the fundus is visualized, move the slit lamp downward (usually by rotating the joystick counterclockwise) until the lesion can be seen.

2. Size Matters

Fundus photography is helpful in establishing and tracking the exact size of a retinal lesion, such as a nevus. However, if fundus photography is unavailable, remember to delineate the lesion's horizontal and vertical measurements along with any other relevant detail. Most practitioners use the patient's optic disc diameter as a reference point when determining the retinal lesion's dimensions. This approach is quite useful, because the optic disc diameter generally will not change over time.

However, some patients exhibit obliquely inserted discs, peripapillary atrophy or other optic disc anomalies that make it more difficult to establish an anatomical benchmark for comparison. By using optic nerve transillumination with a parallelepiped slit image off to either side, the examiner can distinguish the disc outline to calculate a more accurate estimate of the optic nerve head size.

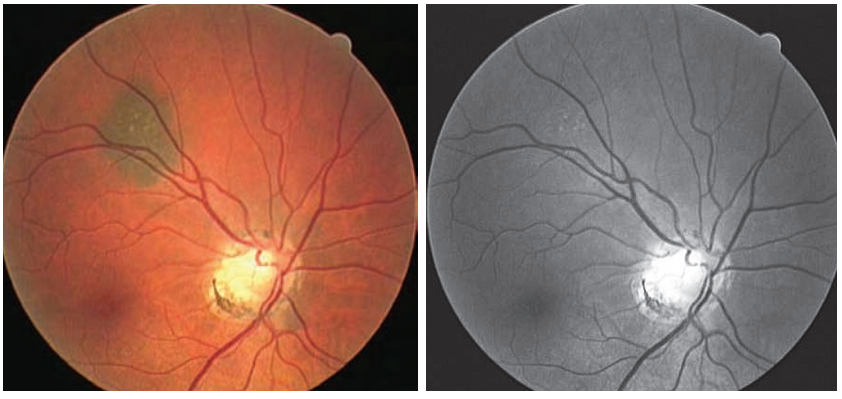
Additionally, when a retinal lesion is identified, be sure to track its exact anatomical location using disc diameters (DD) as a guide. For example, figure 1 shows a choroidal nevus 1.5DD in size that was located 2DD superotemporally to the optic nerve head along the superior arcade.

3. Always Use a Filter

A red-free examination is extremely useful when examining patients with glaucoma or other optic nerve disorders. Use the red-free filter to highlight wedge defects located in the retinal nerve fiber layer or to distinguish optic nerve head drusen. By obscuring retinal hue, a red-free filter dramatically enhances the appearance of blood vessels as well as preretinal, intraretinal and subretinal blood.

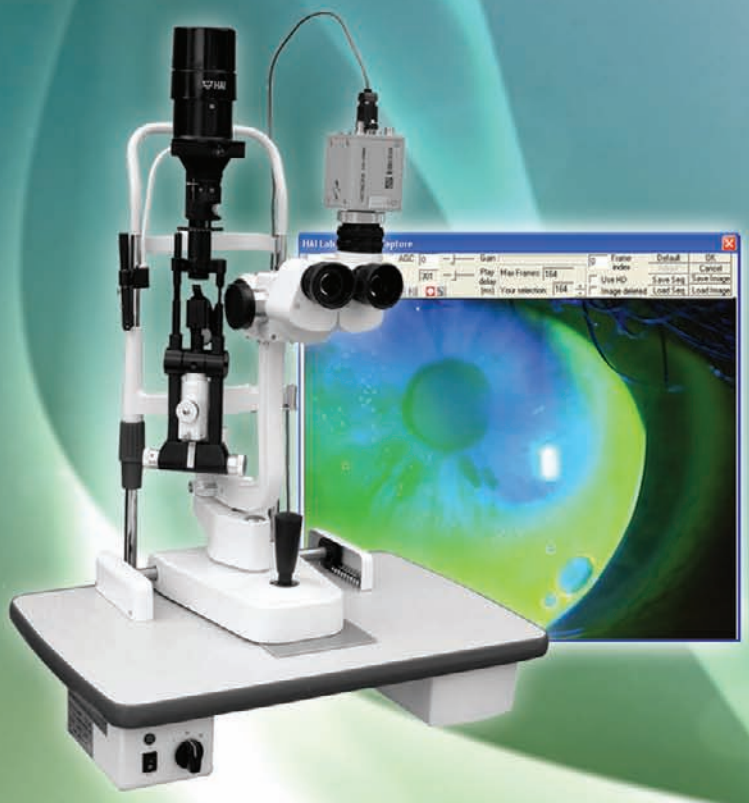
Red-free filtering makes some retinal lesions, such as microaneurysms and dot/blot hemorrhages, look dark black and well demarcated. Further, it causes cystoid macular edema to appear as a light gray, fluid filled area in the macula. Also, changes in the arteriovenus crossings or scattered areas of blood leakage appear increasingly highlighted upon red-free filtering.

Because the RPE attenuates



2, 3. A nevus in white light (left) and red-free light (right). Note its disappearance.

HAI
Laboratories, Inc.

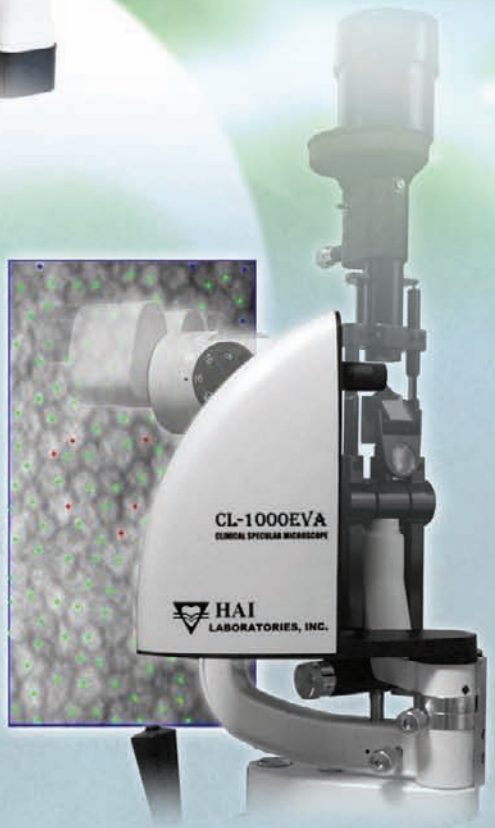


- American quality engineering
- Manufacturer-direct pricing
- On-site installation & training
- Purchase, rent or rent-to-own

VISIT US
VISION EXPO WEST
BOOTH #5043

Bring new diagnostic power to your exam lanes, now with rent and rent-to-own flexible financing options.

Open up a world of possibilites with the HAI SL-5000 Digital Video Slit Lamp, the only anterior segment camera system that allows you to stream real-time high resolution video of the eye to an LCD monitor, big screen, projector, or over a network†. Capture clips or still photos with ease for education and documentation. With the addition of a HAI CL-1000eva Endothelium Viewing Attachment for slit lamps, get all the diagnostic power of a specular microscope in the smallest form factor (and price tag) available anywhere. On the go? The lightweight and ergonomic SL-5000h Handheld Slit Lamp with built-in 10x and 16x magnification is the perfect solution for your mobile needs.



Hightech American Industrial Laboratories, Inc.
320 Massachusetts Ave, Lexington, MA 02420, USA
Tel: (781) 862-9884 **Web:** www.hailabs.com

†Network streaming capability available with HAI IMS/CL Server Suite. Additional hardware required.

Volk Low Power/High Magnification Lenses				
Lens Power	**Field of View (in degrees)***	**Image Magnification**	**Working Distance**	**Comments**
60 D	68/81	1.15x	13mm	High magnification; detailed disc and macular evaluation
78 D	81/97	0.93x	8mm	Good general-use lens
Super 66	80/96	1.0x	11mm	High magnification; detailed disc and macular evaluation
Digital 1.0x Imaging	60/72	1.0x	12mm	High magnification; detailed disc and macular evaluation
Digital High Mag	57/70	1.30x	13mm	Very high magnification; detailed disc and macular evaluation.

Volk High Power/Low Magnification Lenses				
Lens Power	**Field of View (in degrees)***	**Image Magnification**	**Working Distance**	**Comments**
90 D	74/89	0.76x	7mm	Good general-use lens; useful for small pupils; good for peripheral retinal viewing
Superpupil XL	103/124	0.45x	4mm	Useful for small pupils; miniaturized version of SuperField NC lens
Superfield NC	95/116	0.76x	7mm	Magnification of 90 D with large field of view
Super Vitreofundus	NA	NA	NA	Useful for small pupils; good for peripheral retinal viewing
Digital Wide Field	103/124	0.72x	4-5 mm	Good general-use lens; useful for small pupils; good for peripheral retinal viewing

Ocular Instruments Low Power/High Magnification Lenses				
Lens Power	**Field of View (in degrees)***	**Image Magnification**	**Working Distance**	**Comments**
Ocular MaxField 54D	86/137	1.10x	10mm	High magnification; detailed disc and macular evaluation
Ocular MaxField 60D	85/154	1.0x	10mm	High magnification; detailed disc and macular evaluation
Ocular MaxField 66D	91/144	0.91	8mm	High magnification; detailed disc and macular evaluation
Ocular MaxField 72D	102/155	0.83x	7mm	Good general-use lens
Ocular MaxField High Mag 78D	88/154	0.98x	10mm	Good general-use lens

Ocular Instruments High Power/Low Magnification Lenses				
Lens Power	**Field of View (in degrees)***	**Image Magnification**	**Working Distance**	**Comments**
Ocular MaxField 84D	105/158	0.71x	5mm	Good general-use lens; useful for small pupils; good for peripheral retinal viewing
Ocular MaxField Standard 90D	94/153	0.75x	5mm	Good general-use lens; useful for small pupils; good for peripheral retinal viewing
Ocular MaxField 100D	110/146	0.60x	4mm	High-power lens with large field of view
Ocular MaxField 120D	120/173	0.50x	4mm	High-power lens with large field of view
Ocular Ultra View Small Pupil 132D	99/158	0.45x	4mm	Useful for small pupils; good for peripheral retinal viewing

* Static field of view/dynamic field of view

red-free light, a filter can be used to determine the etiology and depth of a retinal lesion. Deeper structures located below the RPE (e.g., choroidal nevi) disappear or diminish with the use of the red-free filter, whereas more superficial entities located above the RPE (e.g., hypertrophy) remain (*figures 2 and 3*). Optic nerve head drusen (mitochondrial calcification) generally becomes visible at the disc surface in the second

Introducing COLOR✓™ Vision Testing from M&S

*The New M&S **American-Made** Smart System 20/20 (shown with optional glare lights, also made in the USA)*

The Nexus 7-inch Wireless Tablet can be utilized as a fully customizable input device for the Smart System AND as a stand-alone system for near testing. Color testing module optional.

COLOR✓ is a fully randomizable protocol using LEA® symbols and numbers that accurately screens for all types of color deficiencies regardless of age. Easy to use and affordably priced, this add-on software can be used on the Smart System at distance or on the Tablet at near. *The LEA optotype is exclusive to M&S Smart System.* Call us today for details and pricing.

Experience the versatility of the Tablet as a customizable controller for the Smart System® AND for conducting stand-alone testing!

FREE TABLET ($575 Value!)* when you purchase a Smart System at Vision Expo in Las Vegas! Booth #11039

M&S® TECHNOLOGIES

The First Choice in Vision Testing Systems

www.mstech-eyes.com

1-877-225-6101

**One free tablet per each full system purchased at Vision Expo in Las Vegas, October 3-5, 2013. Cannot be combined with any other offer or price package.*

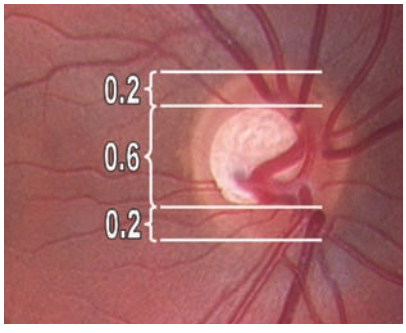
to third decades of life.[1] The drusen appear as highly reflective spherical nodules that can give the disc a scalloped margin appearance. Red-free light causes these retractile bodies to autofluoresce, which may help distinguish them from other anomalies (e.g., peripapillary atrophy).

4. Work Up the Nerve

Optic disc hemorrhages are a risk factor for progression in all forms of glaucoma. Surprisingly, they are easy to overlook during a standard funduscopic examination. According to the Ocular Hypertension Treatment Study (OHTS), eye care practitioners missed almost five times as many optic disc hemorrhages through slit-lamp biomicroscopy than via fundus photograph observation.[2] However, not every practitioner takes fundus photographs—or even has a fundus camera to use—at every exam.

Take a systematic approach when evaluating the optic nerve for glaucoma, looking specifically for disc hemorrhages. Be aware that they often appear near areas of peripapillary atrophy, notching or nerve fiber layer defects. Two-thirds of glaucomatous optic disc hemorrhages appear inferotemporally.[3]

Both vertical cup-to-disc (C/D) ratio and neuroretinal rim tissue size are crucial factors in diagnosing glaucomatous optic nerve damage. Fortunately, neither metric requires expensive diagnostic imaging. When evaluating the optic nerve and/or performing fundus biomicroscopy, the C/D ratio is important because it provides indirect information about the neuroretinal rim tissue (*figure 4*). To better define your neuroretinal rim tissue estimation, record the horizontal C/D ratio. Additionally, when recording the vertical C/D ratio, include the superior and inferior rim measurements.

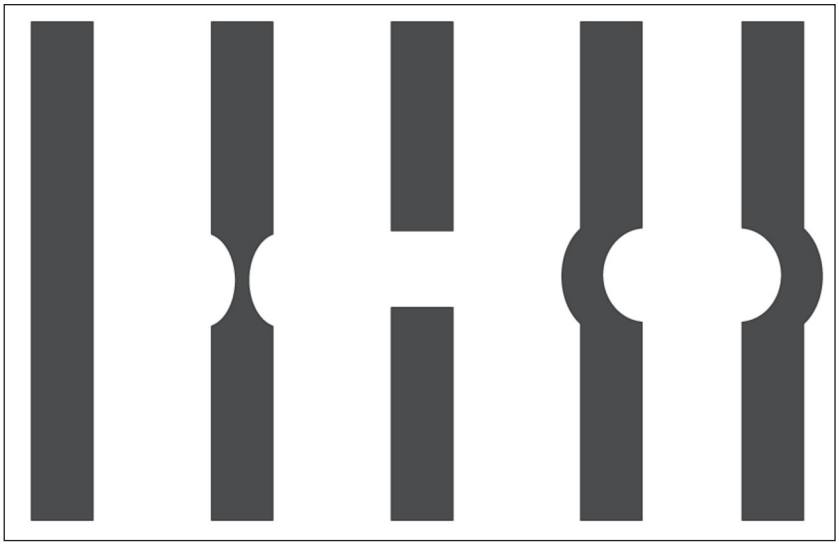


4. Here is an illustration of the proper vertical cup-to-disc assessment method, with symmetrical superior and inferior rim tissue.

A patient with early glaucoma can exhibit a vertical C/D ratio of 0.6, which—at first blush—does not sound glaucomatous. However, a superior neuroretinal rim tissue width of 0.3 and an inferior neuroretinal rim tissue width of 0.1 would be highly suspicious for early glaucomatous damage due to the asymmetry.

5. Master the Macula

For practitioners who do not have immediate access to an optical coherence tomography device, a Watzke-Allen test is helpful in differentiating macular holes from pseudoholes (*figure 5*). For this test, you place a narrow slit-lamp beam over the fovea, then ask the patient to look directly into the center of the beam and describe its overall appearance.



5. Potential patient responses when performing the Watzke-Allen test.

If the patient says that the beam looks unbroken and completely rectangular, the macula is most likely intact. If, however, he or she reports that the beam appears narrow or distorted in the center, this could indicate a partial-thickness (lamellar) hole. Finally, if the patient says the beam as looks broken in the center, he or she may have a full-thickness hole. Vision usually is significantly compromised at this point, and the patient may further describe missing areas of text when reading.

To perform the test accurately, it is helpful to present the beam both horizontally and vertically. More effective patient responses are elicited when the individual is given visual examples to choose from. If the macula of the opposite eye appears generally healthy, performing the Watzke-Allen test in that eye may provide the patient with a point of comparison.

Compliant* Patients Come In For More Eye Exams.[1]

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.

Alcon®

 8/12 POW12060JAD

Rx only


6, 7. Improper patient/doctor ergonomic posture (left) vs. proper ergonomic posturing (right).

6. 'We've Got Your Back'

Patients must be comfortable during clinical procedures. However, throughout a busy workday, it is easy to overlook *your* level of physical comfort. Optometrists perform slit-lamp biomicroscopy numerous times every day. Compared to family practice practitioners, eye care professionals report a much higher incidence of neck, back, hand and wrist pain.[5] Ergonomic considerations are essential because, over time, poor posture will take its toll on the body—leading to decreased efficiency, unwanted aches and pains, and even musculoskeletal disorders.

How many times have you found yourself in an awkward position while performing slit-lamp biomicroscopy? Have you ever used the slit lamp and suddenly realized that your neck is hyperextended, your back is strained and your fingers feel tingly? Eventually, this type of repetitive strain can be detrimental to your career and quality of life.

It is always better to adjust the patient's orientation to best accommodate your positioning than vice versa. Be sure to use an adjustable chair and slit-lamp table. When sitting behind the slit lamp, take the extra time to raise or lower the patient to a height where your back remains straight while you look through the oculars. Move the chair and slit lamp to best suit your needs (*figures 6 and 7*).

Years of performing fundus biomicroscopy with your elbow on the table can lead to ulnar neuropathy. This occurs as a result of ulnar nerve entrapment due to constant pressure applied to the elbow. The ulnar nerve controls fine movements of the hand and runs through the bony groove at the elbow, which has very little fat protection. Most people know the result of ulnar nerve stimulation when they feel the tingle of hitting their "funny bone."

8. The use of a foam pad at the slit lamp can reduce elbow stress tremendously.

Unfortunately, years of ulnar nerve compression while performing fundus biomicroscopy can lead to finger numbness and/or hand weakness. A good way to avoid this condition is to cushion and support the elbow by attaching a thick, soft-foam pad to the slit-lamp table (*figure 8*).

Remember to practice your funduscopy technique on a regular basis to ensure that it does not become a "lost art" for you.

If you are interested in improving your gonioscopy skills, be sure to read the final installation of our series: "Going Back to Gonio." ■

Dr. Walling is a professor and chief of the Medical and Surgical Service at the Michigan College of Optometry's University Eye Center in Big Rapids. Dr. Dinardo is an assistant professor at MCO.

1. Auw-Haedrich C, Staubach F, Witschel H. Optic disc drusen. Surv Ophthalmol. 2002 Nov-Dec;47(6):515-32.
2. Budenz DL, Anderson DR, Feuer WJ, et al. Detection and prognostic significance of optic disc hemorrhages during the Ocular Hypertension Treatment Study. Ophthalmology. 2006 Dec;113(12):2137-43.
3. Kuldev S. Finding and responding to disc hemorrhages. Rev Opthalmol. 2010 Apr;17(4):102-4.
4. Tanner V. Williamson TH. Watzke-Allen slit beam test in macular holes confirmed by optical coherence tomography. Arch Ophthalmol. 2000 Aug;118(8):1059-63.
5. Kitzmann, AS, Fethke NB, Baratz KH, et al. A survey study of musculoskeletal disorders among eye care physicians compared with family medicine physicians. Ophthalmology. 2012 Feb;119(2):213-20.

PEER • REVIEWED • PRA • ARTICLE •

Too Much Sun, Not So Fun

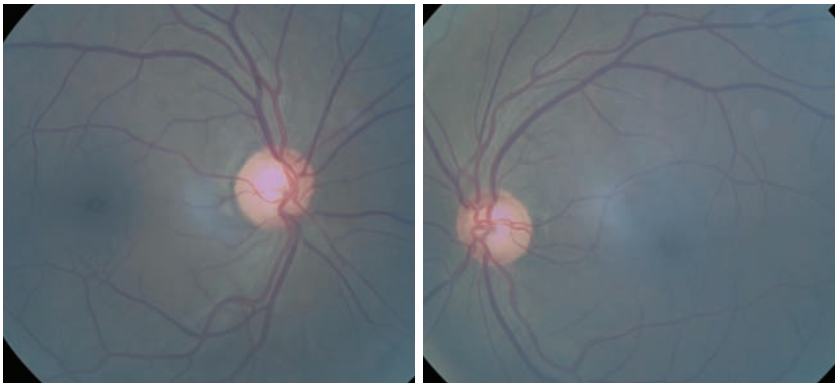
Solar and eclipse retinopathy can cause permanent visual acuity impairment, in addition to other serious ocular complications.

By Chung To, OD, Wendy McGonigal, OD, and Shephali Patel, OD, MS

Solar retinopathy is caused by unprotected macular exposure to direct sunlight or other forms of radiant energy. The diagnosis is made via a positive history of direct sun exposure along with the clinical presentation of foveal lesions.

No definitive medical treatments currently exist. So, abstaining from direct sunlight gazing for any reason is the primary preventative measure against solar retinopathy.

This article outlines two separate cases of solar retinopathy. In addition to reviewing the most current literature on the condition, we describe the typical clinical presentation and discuss a potential variant—eclipse retinopathy.



1, 2. Fundus photographs of the 62-year-old patient described in Case One (OD left, OS right). Note the red lesions located at both foveas.

Case One

History

A 62-year-old white male presented complaining of blurred vision and associated photosensitivity in both eyes. The patient said that he first noticed these complications several years earlier. He admitted to gazing at the sun for unknown lengths of time while under the influence of lysergic acid diethylamide (LSD). He did not report wearing any protective filters at that time. The visual symptoms manifested shortly after the incident and have persisted ever since.

The patient's last eye exam was five years ago. Ocular and family histories were unremarkable; however, his medical history was significant for diabetes, hypertension, hyperlipidemia and schizophrenia, as well as cocaine, alcohol and nicotine dependence. His current medications included aspirin, hydrochlorothiazide, metformin, mirtazapine and potassium chloride. He reported drug allergies to thorazine, penicillin and haloperidol.

Diagnostic Data

On initial examination, his best-corrected visual acuity measured 20/20-2 OD and 20/25+2 OS. His pupils, extraocular motilities and confrontation visual fields were within normal limits. Slit lamp examination was significant for conjunctival pingueculas and trace lenticular nuclear sclerosis OU.

His IOP was 17mm Hg OD and 16mm Hg OS. Funduscopy revealed

There's never been a better time to do something about macular health.*

ICaps® Lutein and Omega-3 Vitamin Help:

Once-Daily

- PROTECT the retina with lutein[1]*
- PROMOTE macular health[2]*
- SUPPORT the natural defense system of the eye[3]*

ICaps® L&O Vitamins have ingredients studied in AREDS2. It's the only once daily softgel with 10 mg of Lutein, 2 mg of Zeaxanthin and beneficial levels of Omega-3s to help support macular health.*

Recommend ICaps® Lutein & Omega-3 Vitamin to your patients before another minute goes by.

Visit **icapsvitamins.com** to learn more.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

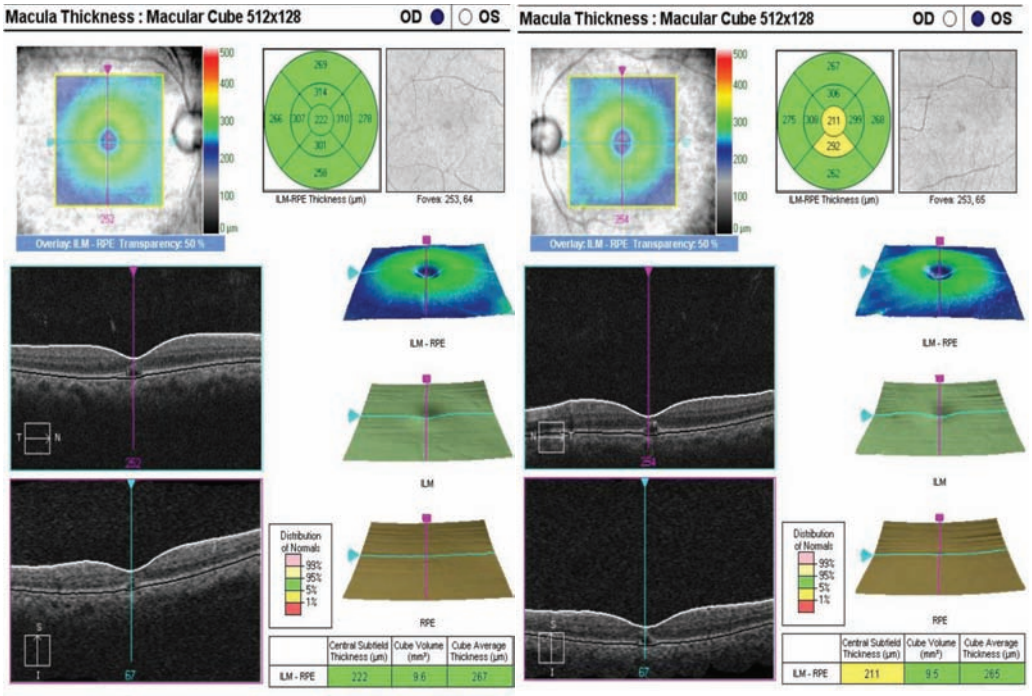
References: (1) Richer S, Stiles W, Statkute L, et al. Double-masked, placebo-controlled, randomized trial of lutein and antioxidant supplementation in the intervention of atrophic age-related macular degeneration: the Veterans LAST study (Lutein Antioxidant Supplementation Trial). Optometry. 2004;75:3-15. (2) SanGiovanni JP, Chew EY, Clemons TE, et al. The relationship of dietary lipid intake and age-related macular degeneration in a case-control study. AREDS Report No. 20. Arch Ophthalmol. 2007;125:671-679. (3) Chiu CJ, Taylor A. Nutritional antioxidants and age-related cataract and maculopathy. Experimental Eye Research. 2007;84:229-245.

Alcon®

a Novartis company

FloraGLO® LUTEIN

 2/13 ICP13001JAD



3, 4. SD-OCT scan revealed central RPE disruptions and an intraretinal cysts OU (OD left, OS right).

pink and distinct optic nerves with an estimated cup-to-disc ratio of 0.7 OU. The macular regions revealed red lesions at both foveas, and were surrounded by a well-circumscribed area of retinal pigment epithelium (RPE) hyperpigmentation (*figures 1 and 2*). The posterior poles and peripheral retinae were within normal limits OU.

We obtained a spectral-domain optical coherence tomography (SD-OCT) scan of the maculae and optic nerves, which revealed central RPE disruptions with an intra-retinal cyst in each eye (*figures 3 and 4*). Central macular thickness measured 222µm OD and 211µm OS. Additionally, the SD-OCT scan revealed normal retinal nerve fiber layer (RNFL) thickness without any evidence of thinning OU.

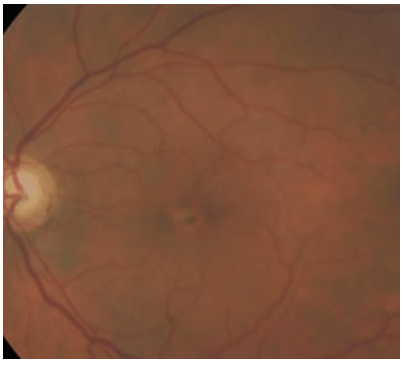
Diagnosis

Based upon the patient's history and clinical findings, we diagnosed him with solar retinopathy.

Case Two

History

A 64-year-old white male presented complaining of longstanding blurred vision in his left eye that did not improve with spectacle use. At a previous eye examination, the patient reported staring at a partial solar eclipse on July 9, 1964 with his left eye, while holding his right eye closed. After viewing the eclipse for several minutes, the patient noted seeing only "white" out of his left eye for the rest of the afternoon. He did not report wearing any protective filters during the eclipse gazing.



5. In Case Two, the 64-year-old patient's left eye exhibited pigment irregularity surrounded by an area of hypopigmentation at the macula.

His ocular history was remarkable for pigment dispersion glaucoma. His medical history was significant for hypertension and bipolar disorder. Current medications included latanoprost, dorzolamide/timolol, atenolol, hydrochlorothiazide/lisinopril and lithium carbonate. He reported no known allergies.

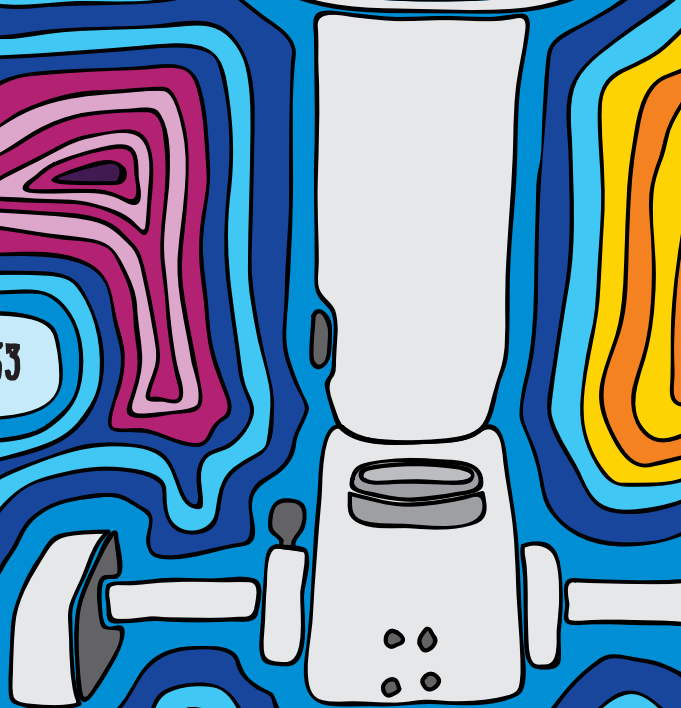
Diagnostic Data

On examination, his best-corrected visual acuity measured 20/50+1 OD and 20/25-2 OS. His pupils, extraocular motilities and confrontation visual fields were within normal limits. Slit lamp examination revealed corneal Krukenberg spindle and iris transillumination defects OU, as well as visually significant, bilateral nuclear sclerotic cataracts (OD > OS).

His IOP measured 14mm Hg OD and 16mm Hg OS. Funduscopy revealed pink and distinct optic nerves in both eyes, with an estimated cup-to-disc ratio of 0.65 OD and 0.7 OS. The left optic nerve exhibited superior notching and vessel barring, while the right nerve appeared healthy. The macular region of the left eye demonstrated pigment irregularity surrounded

EXPERIENCE THE POWER OF COLOR TOPOGRAPHY

New Keratograph 5M Topographer

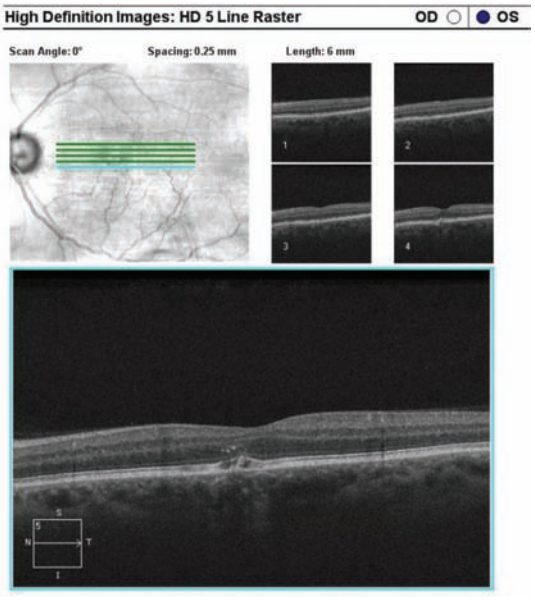


Visit us at the **Vision Expo West, booth MS8053** to claim your free USB stick!

facebook.com/OCULUSusa

OCULUS®

Toll free 888-519-5375
sales@oculususa.com www.oculususa.com



6. High-definition, five-line raster of the left eye highlighted the RPE disruption.

by an area of hypopigmentation (*figure 5*). Again, the right macula appeared healthy. Both posterior poles were within normal limits; however, the peripheral retinae were significant for pavingstone degeneration OU.

SD-OCT of both maculae and optic nerves revealed central RPE disruptions and a central thickness of 282µm OS. Additional imaging using the high-definition, five-line raster highlighted the RPE disruption (*figure 6*). The scans of the right eye revealed a normal foveal contour with a central thickness of 287µm.

The SD-OCT scan also revealed thinning in the RNFL superior quadrant of the right eye, as well as thinning in all quadrants of the left eye (*figure 7*). A review of the patient's previous 24-2 Humphrey visual field test showed scattered defects OU.

Diagnosis

Based upon the patient's history and clinical findings, we diagnosed him with eclipse retinopathy.

Treatment and Follow-up

We educated both patients on our findings and firmly discouraged any future direct sunlight gazing for any reason. We also discussed the benefits of UV-protective eyewear while outdoors.

We scheduled both patients for regular follow-up examinations every six-months to measure the stability of their best-corrected visual acuities, as well as obtain dilated fundus photographs and macular SD-OCT scans.

Discussion

Solar retinopathy results from retinal and macular damage secondary to direct exposure to sunlight and/or other light radiant energy. Variants of solar retinopathy that sometimes are used synonymously include eclipse retinopathy and foveomacular retinitis. Eclipse retinopathy is a unique form of solar retinopathy that is a consequence of retinal damage sustained during solar eclipse viewing, whereas foveomacular retinitis describes the clinical characteristics of solar retinopathy without eliciting a history of solar exposure.[1]

The exact prevalence of solar retinopathy is unknown. This likely is because most cases are unreported due to the mild and nonspecific visual complaints following sun exposure. Nevertheless, the incidence of reported cases tends to increase following a national public announcement of a solar eclipse.[2] The largest nationwide active case study was conducted by the British Ophthalmological Surveillance Unit following the full solar eclipse on August 11, 1999.[3] Its researchers reported 70 cases of solar retinal injury within the UK alone. In 39% of the cases, the time spent looking at the eclipse was reported to be less than 60 seconds. The male-to-female ratio was 1.2:1.0, with an average age of 29.5 years.[3] A cross-reference of smaller studies following the 1999 eclipse revealed similar trends.[4]

Solar eclipse gazing remains the most common reason why patients stare into the sun.[5] Other explanations described in the literature include religious and cultural rituals, mental illness, hallucinogenic drug abuse, recreational sunbathing, military deployment in bright/desert environments and incidental exposure secondary to simple curiosity.[1,6,7]

During solar retinal exposure, most patients often report a positive afterimage with short-term dazzling sensations.[1] Visual disturbances arise quickly after exposure, with varied complaints of a small central scotoma, photophobia or reduced visual acuity. In cases of severe exposure, metamorphopsia, chromotopsia and headaches with orbital and retro-orbital pain also may occur.[1,4]

The most common visual complaint is decreased visual acuity (ranging from 20/30 to 20/200), which generally varies with exposure severity.[8,9] One study of 319 patients with solar retinopathy indicated improvements in vision to 20/40 or better in 80% of cases without any deterioration over time.[5] The researchers also reported no color vision defects.[5] A similar study of 70 cases revealed no permanent visual loss over a three-month duration.[3]

Invest In Your Practice And Get A Guaranteed Positive Return.

Lombart's CS-4 Package Offers Quality, Style & Value.

Ask about optional Slit Lamp & Chart Projector configurations.

$13,595

Or lease for $269/mo. for 60 months *

Package includes:

- The Lombart CS-4 Chair & Stand
- Topcon VT-10 Refractor
- Topcon SL-2G Slit Lamp
- Reichert LongLife Chart Projector with mount, slide & screen
- Upgrade to the Lombart CVSi21 for only $2000 more or to the CVS-PC for only $1500 more — Additional upgrades & configurations available.

(1-800-566-2278)

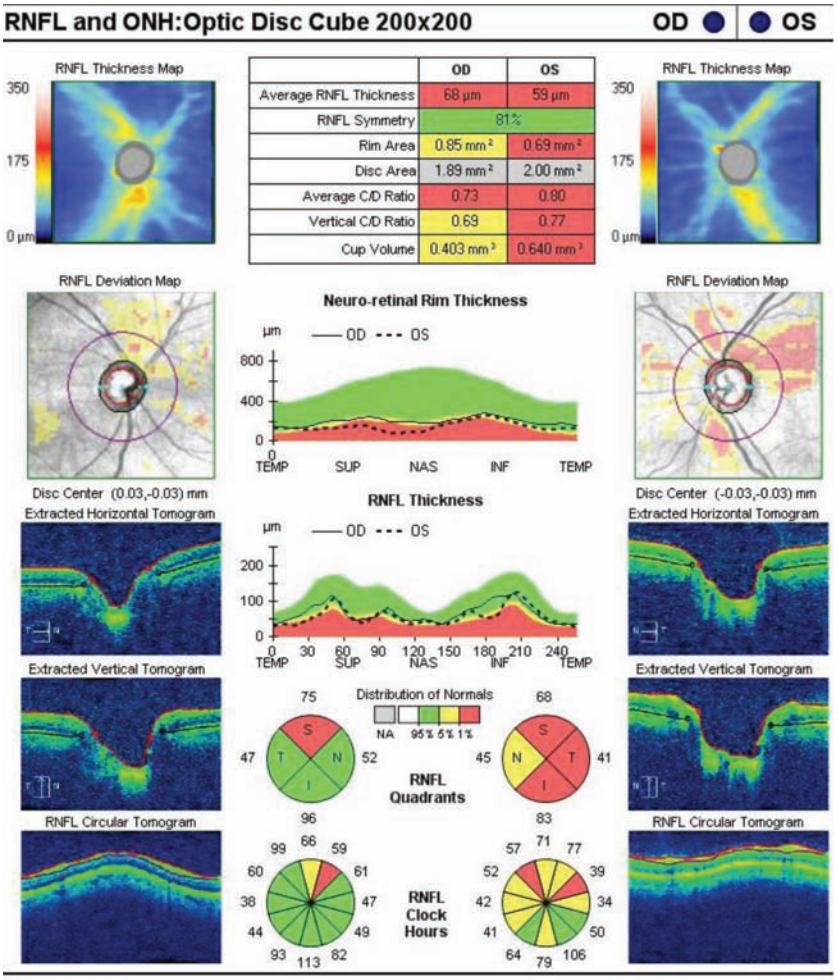
Call 1-800-Lombart

Or Your Local Lombart Representative.

Corporate Office - 5358 Robin Hood Road, Norfolk, VA 23513-2430
757-853-8888 | FAX 757-855-1232 | 800-566-2278 | 800-446-8092
www.lombartinstrument.com

ATLANTA•BALTIMORE/WASHINGTON D.C.•BOSTON•BOYNTON BEACH/MIAMI•BRADENTON•CHARLOTTE
CHICAGO•CINCINNATI•DALLAS•DENVER•DETROIT•GREENSBORO•HOUSTON•KANSAS CITY•KNOXVILLE•LOS ANGELES
MILWAUKEE•MINNEAPOLIS•NEW JERSEY/NEW YORK•NORFOLK•PORTLAND•SACRAMENTO•SAN DIEGO•SAN FRANCISCO

***Lease rate subject to credit approval, 1st payment is paid for by leasing company at signing with 59 remaining rental payments of $269 and a $1.00 purchase option. Taxes, freight and installation additional. Hand Instruments optional. Quantities limited. Subject to change without notice.**



7. SD-OCT scan of both eyes revealed thinning in the RNFL superior quadrant of the right eye, as well as thinning in all quadrants of the left eye.

The clinical course and presentation of solar retinopathy is consistent throughout the literature. Within the first 24 to 48 hours following solar retinal exposure, clinical examination of the macula typically reveals normal to subtle pigmentary mottling and edema. A yellow spot develops in the fovea with a loss of reflex, and a surrounding cuff of hyperpigmentation becomes more apparent within a week after exposure. The macular changes include RPE hypopigmentation, with an increase in foveal erythema after one month. Persistent macular pigmentary irregularity is observed as a longstanding change, followed by resolution of foveal erythema with or without retention of foveal RPE hypopigmentation.[1,3,10,11]

The mechanism of how light causes retinal damage has been studied thoroughly.[1,12-14] For light to harm any part of the eye, it must be absorbed. In the human eye, the ocular media—including the cornea, aqueous, lens and vitreous—control the absorption of radiant energy from light reaching the retina.[1]

The transmissions through these structures remain a constant throughout life, with the exception of the lens secondary to age-related changes. Light transmission via an aging lens is reduced to longer and less harmful wavelengths, due to both reflection and scattering.[12] Interestingly, cataract development can be a protective measure against chronic shorter wavelengths that ultimately cause retinal changes.[1] However, the ocular media's transparency permits light to focus entirely on the retina—particularly the macula. As a result, the retina becomes highly susceptible to light absorption and consequent damage.[12]

Three models of how light damages the retina have been proposed, including mechanical, thermal and photochemical methods. Mechanical and thermal disruptions are caused by absorption of shorter wavelengths that alter retinal structure. Mechanical damage produces sonic transients or shock waves, whereas thermal damage is the result of increased temperature within the retina (typically by 10°C to 20°C). Neither of these processes are likely to cause solar retinopathy, and are in fact intentionally exploited during ophthalmic laser treatment (e.g., Nd:YAG and argon laser photocoagulation).[12]

Photochemical damage, on the other hand, results when long-wavelength blue and/or UV light is absorbed. This initiates a chain of chemical reactions that disrupt the normal physiological structure of the retina.[12,13] Recent research provides evidence that solar retinopathy chiefly is caused by photochemical effects.[13,14]

With the development of more advanced imaging devices, the understanding of solar retinopathy's impact on vision has improved dramatically in the last decade. Several reviews of OCT findings indicated that patients with solar retinopathy exhibit significant

Join us for an **EXPERIENCE**

Brien Holden Vision Institute

eXPeRIence

Thursday, 24 October
7:15pm – 9:30pm
Metropolitan Ballroom B
Sheraton Seattle Hotel

At Brien Holden Vision Institute we believe sight is a fundamental right for everyone...everywhere. Come learn more at this engaging, interactive experience about the mission and innovations from our one-of-a-kind self-funding global organisation.

Join us for drinks, hors d'oeuvres, and informal conversations with eye care and research luminaries such as Dr Tom Cornsweet - entrepreneur and inventor of the world's first auto-refractor; and Professor Brien Holden - a world leader in vision science, improving eye health and eliminating vision impairment and avoidable blindness around the world.

To register for this free event, go to www.surveymonkey.com/s/BrienHoldenExperience

For more information, go to www.brienholdenvision.org or contact us at info@brienholdenvision.org

vision
for everyone... everywhere
brienholdenvision.org

foveal pathology.[10,15,16] In these studies, associated retinal defects were concentrated centrally at the level of the inner and outer photoreceptor segment junction.[10,15,16]

In another evaluation of OCT findings in patients with a history of solar eclipse retinopathy, researchers documented the presence of voids with decreased foveal thickness at the photoreceptor layer in 10 of 21 affected eyes.[17] Signal defects in both the inner and outer photoreceptor segments also were observed. In these individuals, there appears to be a strong correlation between decreased central foveal thickness and full-thickness voids on OCT analysis with reduced visual acuity.[17-19] Such findings are consistent with those documented in smaller case reports using OCT analysis as a predictor of visual function in patients with confirmed solar retinopathy.[11,20,21]

Additionally, a retrospective, observational case series comparing OCT findings and fluorescein angiography (FA) was published in 2009.[20] Most defects observed on FA revealed small punctate or pinpoint central RPE transmission, or window defects. It is worth noting that in all reported cases of definitive solar retinopathy, FA did not reveal characteristic lesions of the disease.[20]

Multifocal electroretinogram (mfERG), a newer electrophysiological technique that objectively maps retinal function, also has been used to screen patients suspected of solar retinopathy. One study showed that eight patients experienced a reduction in central retinal function after initial solar exposure using mfERG testing.[22]

At the two-month follow-up, all patients showed improvements in both visual acuity and mfERG amplitude; however, when compared to normal subjects, there was still an overall acuity reduction.[22]

Another study showed similar reductions in mfERG findings, with gradual visual recovery in a smaller patient population.[23] The long-term effects of retinal function in patients with chronic solar retinopathy also elicited a decrease in mfERG response.[23,24] These testing results accurately correlate to the clinical presentation and visual acuity outcome in solar retinopathy patients.

In addition to the retina, acute and chronic UV exposure damages other ocular structures that absorb light. The five most common sun-induced ocular disorders include: cataracts, age-related macular degeneration, pterygium, photokeratitis and periocular skin cancer.[25] Other sunlight-related eye diseases include pinguecula, conjunctival melanoma, climatic droplet keratopathy, primary spheroidal degeneration and intraocular malignant melanoma.[25]

Ultimately, the best treatment for solar retinal damage is prevention. Adequate education on the harmful effects of sunlight on retinal tissue and other ocular media should be discussed. Appropriate referrals for psychological services should be considered for patients who continue to practice such behavior.[1]

Proper UV protection should be recommended for individuals who are more prone to light damage—specifically those who spend considerable time outdoors or live in an environment that receives a significant volume of sunshine throughout the year. It is important to note that during a solar eclipse, normal sun spectacle eyewear is insufficient to protect the retina. Indirect observation (e.g., watching a live broadcast on the computer or television) is the safest course.[1] Viewing with a pinhole camera also is permissible.

While treatment often is unnecessary, the use of systemic steroids has been proposed.[7] However, no current clinical studies exist to confirm the efficacy of this approach.

Given a positive history of sun gazing, clinical characteristics of subtle foveal lesions confirmed via OCT and a proportionately correlated best-corrected visual acuity, you can confidently diagnose an individual with solar retinopathy. In the absence of a positive history with similar clinical findings, other conditions that involve the fovea should be considered, including age-related macular degeneration, macular holes, epiretinal membranes and hereditary macular dystrophies.

The exact prevalence of solar retinopathy is unknown, likely because most individuals fail to report mild and/or nonspecific visual complaints following sun exposure. Visual prognosis is excellent in most instances, with no treatment required. Finally, be sure to instruct all patients not to directly gaze at the sun or an eclipse for any reason.

As a public service announcement, the next solar eclipse is predicted to occur on November 3, 2013, and will be visible to inhabitants of Europe, Asia, Africa and parts of North America.[26] ■

Dr. To currently is starting an interprofessional polytrauma/TBI advanced clinical fellowship in optometry at the James A. Haley Veterans' Hospital in Tampa, Fla. He managed these two cases during his residency at the Lake City VA Medical Center in Florida.

Dr. McGonigal is the associate chief of optometry and optometric residency coordinator at the Lake City VA Medical Center.

Dr. Patel is a resident supervisor and director of low vision services at the Lake City VA Medical Center.

1. Istock TH. Solar retinopathy: a review of the literature and case report. J Am Optom Assoc. 1985 May;56(5):374-82.
2. Tsatsos M, Eke T. Public health warnings of solar retinopathy risk in European newspapersprior to the 2006 solar eclipse. Arch Soc Esp Oftalmol. 2007 Dec;82(12):735.
3. Michaelides M, Rajendram R, Marshall J, Keightley S. Eclipse retinopathy. Eye (Lond). 2001 Apr;15(Pt 2):148-51.
4. Källmark FP, Ygge J. Photo-induced foveal injury after viewing a solar eclipse. Acta Ophthalmol Scand. 2005 Oct;83(5):586-9.
5. Rai N, Thuladar L, Brandt F, et al. Solar retinopathy. A study from Nepal and from Germany. Doc Ophthalmol. 1998;95(2):99-108.
6. Hope-Ross M, Travers S, Mooney D. Solar retinopathy following religious rituals. Br J Ophthalmol. 1988 Dec;72(12):931-4.
7. Schatz H, Mendelblatt F. Solar retinopathy from sungazing under the influence of LSD. Br J Ophthalmol. 1973 Apr;57(4):270-3.
8. Atmaca LS, Idil A, Can D. Early and late visual prognosis in solar retinopathy. Graefes Arch Clin Exp Ophthalmol. 1995 Dec;233(12):801-4.
9. MacFaul, PA. Visual prognosis after solar retinopathy. Br J Ophthalmol. 1969 Aug;53(8):534-41.
10. Hossein M, Bonyadi J. Spectral-domain optical coherence tomography features of mild and severeacute solar retinopathy. Ophthalmic Surg Lasers Imaging. 2011 Sep 8;(42):84-6.
11. Chen JC, Lee LR. Solar retinopathy and associated optical coherence tomography findings. Clin Exp Optom. 2004 Nov;87(6):390-3.
12. Roh S, Weiter JJ. Light damage to the eye. J Fla Med Assoc. 1994 Apr;81(4):248-51.
13. Algvere PV, Marshall J, Seregard S. Age-related maculopathy and the impact of blue light hazard. Acta Ophthalmol Scand. 2006 Feb;84(1):4-15.
14. Okuno T. Hazards of blue solar light. Appl Opt. 2008 Jun 1;47(16):2988-92.
15. Chen KC, Jung JJ, Aizman A. High definition spectral domain optical coherence tomography findings in three patients withsolar retinopathy and review of the literature. Open Ophthalmol J. 2012;6:29-35.
16. Suhr CL, Buffano RM, Sellers A. The use of optical coherence tomography to aid in diagnosing solar maculopathy. Optometry. 2011 Aug;82(8):481-4.
17. Gulkilik G, Taskapili M. Association between visual acuity loss and optical coherence tomography findings in patients with late solar retinopathy. Retina. 2009 Feb;29(2):257-61.
18. Chen RW, Gorczynska I, Srinivasan VJ, et al. High-speed ultrahigh-resolution optical coherence tomography findings in chronic solar retinopathy. Retin Cases Brief Rep. 2008 Spring;2(2):103-5.
19. Cho HJ, Yoo ES, Kim CG. Comparison of spectral-domain and time-domain optical coherence tomography in solar retinopathy. Korean J Ophthalmol. 2011 Aug;25(4):278-81.
20. Jain A, Desai RU, Charalel RA, et al. Solar retinopathy: comparison of optical coherence tomography (OCT) andfluorescein angiography (FA). Retina. 2009 Oct;29(9):1340-5.
21. Klemencic S, McMahon J, Upadhyay S, Messner L. Spectral domain optical coherence tomography as a predictor of visual function in chronic solar maculopathy. Optom Vis Sci. 2011 Aug;88(8):1014-9.
22. Arda H, Oner A, Mutlu S, et al. Multifocal electroretinogram for assessing sun damage following the solar eclipse of 29 March 2006: multifocal electroretinography in solar maculopathy. Doc Ophthalmol. 2007 May;114(3):159-62.
23. Schatz P, Eriksson U. Multifocal electroretinography and optical coherence tomography in two patients withsolar retinopathy. Acta Ophthalmol Scand. 2004 Aug;82(4):476-80.
24. Stangos AN, Petropoulos IK, Pournaras JA, et al. Optical coherence tomography and multifocal electroretinogram findings in chronicsolar retinopathy. Am J Ophthalmol. 2007 Jul;144(1):131-4.
25. Young RW. The family of sunlight-related eye diseases. Optom Vis Sci. 1994 Feb;71(2):125-44.
26. Timeanddate.com. November 3, 2013: Total solar eclipse. Available at: www.timeanddate.com/eclipse/solar/2013-november-3. Accessed August 7, 2013.

If your practice could use financial insight, you could use U.S. Bank.

Whether you're expanding or starting your practice, U.S. Bank can help with equipment, buy-outs, refinancing or more. With the help of a trusted U.S. Bank Practice Finance Specialist, our Specialists will prescribe solutions that may help your practice.

Acquisition Financing | Practice Debt Refinancing | New Practice Start-Ups | Buy-Ins
Expansions | Relocations | Buy-Outs

Call Jeramie Eimers
Practice Finance Specialist
800-313-8820 Ext. 2

All of us serving you®

EST. 1863 | usbank®

usbank.com/practicefinance connect

2 CE Credits
(COPE approved)

PEER • REVIEWED • PRA • ARTICLE

Rare Presentations That Aren't That Rare Anymore

Now more than ever, the familiar optometric saying holds true: 'It ain't rare if it's in your chair.' By Marta C. Fabrykowski, OD, and Anupam Laul, OD

In medicine, the simple explanation is often the correct explanation. That is, conditions that are most common among the general population will appear more often in our exam chairs. Such expectations of familiar conditions govern our differential diagnosis list—drusen suggests macular degeneration; punctate epithelial erosions likely signal dry eye syndrome.

But we can't fly on autopilot; as primary eye care practitioners, we need to stay vigilant to identify what could be a rare, potentially systemically damaging condition. Indeed, over the past few years, we've seen an increased incidence of once relatively rare ocular conditions. Some of these conditions are newly on the rise, whereas others are making a resurgence. In either case, we may be seeing rarer conditions more often than we expect.

As a profession, we are now recognizing and diagnosing more complicated ocular conditions, many of which have underlying systemic causes. We have the ability to distinguish benign from irregular growths that could later be found cancerous. We see conjunctivitis that could be the result of an ocular or systemic superinfection. Patients can present with an odd ocular inflammation that may turn out to be a neurologic manifestation of a sexually-transmitted infection. The panorama of presentations is truly evolving.

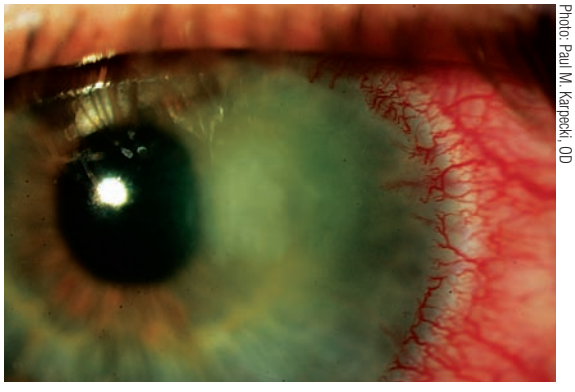


Photo: Paul M. Karpecki, OD

Less rare in your chair: active ocular MRSA infection.

To aid us in paring down long

Release Date: September 2013
Expiration Date: September 1, 2016
Goal Statement: During the past few years, eye doctors have seen an increased incidence of once relatively rare ocular conditions. To that end, this course presents four different cases of such not-so-rare ocular conditions, each of which has some systemic involvement. As primary care practitioners, optometrists must be especially vigilant when presented with ocular signs that may stem from systemic problems.

Faculty/Editorial Board: Marta C. Fabrykowski, OD, and Anupam Laul, OD
Credit Statement: This course is COPE approved for 2 hours of CE credit. COPE ID# 38874-GO. Check with your local state licensing board to see if this counts toward your CE requirement for relicensure.
Joint-Sponsorship Statement: This continuing education course is joint-sponsored by the Pennsylvania College of Optometry.
Disclosure Statement: Drs. Fabrykowski and Laul have no financial relationships to disclose.

differential diagnosis lists, we may need to rely on laboratory methods. Meanwhile, our diagnostic technology has taken great strides in culturing, obtaining histological samples and imaging, thus allowing us to more accurately identify etiology. Just to name a few: Optical coherence tomography (OCT) can now delineate each layer of the retina; bacterial culturing can take place either via test tube or plate; and cerebrospinal fluid (CSF) can be tested to identify even miniscule levels of pathogens.

Along with these increasingly complicated conditions and diagnoses come intricate treatment algorithms. As primary eye care practitioners, we may be comanaging patients who are receiving not only oral medicines, but also intraocular, intravenous and even radiologic treatment. Just like the evolving diseases we are seeing, our roles must too advance.

We've noticed a rise in a great number of conditions, but the following are four patient cases that we, like many of you, have observed with increasing frequency. We begin with anteriorly-presenting conditions and progress to those that are more likely found in the posterior segment.

Microsporidial Keratitis

A 26-year-old black female presented to the clinic with blurred vision, photophobia and tearing after wearing her friend's used cosmetic contact lens. She wore the lenses continuously (overnight wear) for two to three days until she started having pain the day before she presented. Her medical history was significant for HIV.

• ***Diagnostic data.*** Pertinent exam findings included visual acuity of 20/40 OD and 20/30 OS, with mild conjunctival injection OD and OS. Adnexa and lids were normal OU. Corneal findings revealed Grade 3+ punctate erosions (OD>OS). Anterior chambers were deep and quiet.

In the above case, microsporidia keratitis was among the considerations (in addition to the usual offenders: keratoconjunctivitis sicca, infiltrative keratitis, herpetic keratitis, microbial keratitis, tight lens syndrome, exposure keratitis, chemical keratitis, *Acanthamoeba*, epidemic keraconjunctivitis, and others). The patient is HIV-positive and has a history of non-compliant contact lens wear. Although rare, microsporidial infections have been on the rise since the early 1990s.[1-3]

More than 1,500 microsporidia species have been identified, although only a handful affect humans.[4] Microsporidia are unicellular eukaryotes that were once thought to belong in the protozoan family; however, based on DNA identification, we now know they are more closely related to fungi.[4]

Although the mode of transmission to human hosts is not entirely clear, ingestion or inhalation of contaminated soil or water might be the primary source of entry.[4] Due to its dense electron gylcoprotein and chitin layer, the spores are highly resistant to environmental damage.[4-6] Some studies have shown microsporidial spores in human urinary tracts, suggesting the possibility of sexual transmission.[5,6] There have also been cases of transmission by zoonosis from asymptomatic domestic and wild animals.[5,7]

Symptoms of microsporidia vary depending on the site of infection. Microsporidia can infect the respiratory system, intestinal and bile tract, urinary tract, eyes, muscles and brain.[4,5]

Microsporidia are opportunistic organisms that can affect both immunocompetent and immunocompromised hosts (although they more commonly affect those who are immunocompromised).[1,8,9] The life cycle of the organism begins

Types of Microsporidia and How They Affect the Body

Microsporidian Species	Clinical Manifestation
Anncaliia algerae	Keratoconjunctivitis, skin and deep muscle infection
Enterocytozoon bieneusi	Diarrhea, acalculous cholecystitis
Encephalitozoon cuniculi and *Encephalitozoon hellem*	Keratoconjunctivitis, infection of respiratory and genitourinary tract, disseminated infection
Encephalitozoon intestinalis (syn. *Septata intestinalis*)	Infection of the GI tract causing diarrhea, and dissemination to ocular, genitourinary and respiratory tracts
Microsporidium (*M. ceylonensis* and *M. africanum*)	Corneal infection
Nosema sp. (*N. ocularum*), *Anncaliia connori*	Ocular infection
Pleistophora sp.	Muscular infection
Trachipleistophora anthropophthera	Disseminated infection
Trachipleistophora hominis	Muscular infection, stromal keratitis (probably disseminated infection)
Tubulinosema acridophagus	Disseminated infection
Vittaforma corneae (syn. *Nosema corneum*)	Ocular infection, urinary tract infection

Source: CDC, http://dpd.cdc.gov/dpdx/HTML/Frames/M-R/Microsporidiosis/body_Microsporidiosis_page2.htm

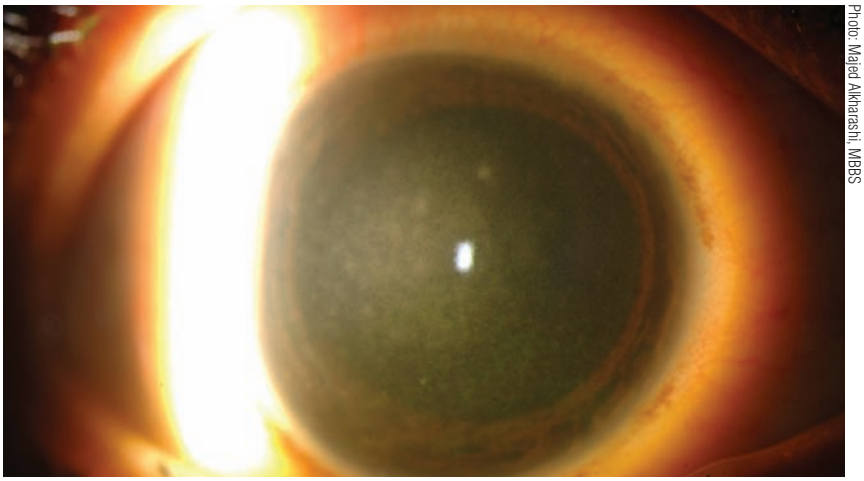


Photo: Majed Alkharashi, MBBS

Superficial punctate erosions in microsporidial infection.

with the injection of sporoplasm via a polar tubule into the host cell. The sporoplasm replicates rapidly via binary or multiple fission. Spores then form by sporogony (in free cytoplasm or in a vacuole) to finally mature and release continuing the cycle.

The most common ocular presentation of microsporidia is keratoconjunctivitis, although at least one case of sclerouveitis resulting in retinal detachment has been reported.[1,2,5,6,10]

Typical presentation may vary depending on the immune response of the patient. Historically, epithelial keratitis was seen in immunocompromised patients, whereas stromal keratitis was seen in immunocompetent patients.[1,6] This was believed to be due to a more aggressive immune response in immunocompetent patients, resulting in stromal involvement. But more recent studies show that such may not be the case.[1]

Clinical presentation includes multiple, coarse, superficial epithelial punctate erosions in either a peripheral or diffuse pattern, or central corneal edema with an anterior chamber reaction and fine keratic precipitates.[1,8] An infiltrate may develop after the epithelial keratitis.[1,8]

Symptoms include pain, decreased vision, photosensitivity, tearing and foreign body sensation.[1,2,8]

• ***Diagnosis.*** Because the clinical presentation and symptoms are similar to keratitis, it is sometimes difficult to differentiate microsporidial infection from other etiologies. To make a definitive diagnosis, either corneal scraping or staining with gram stain, potassium hydroxide plus calcofluor, or modified trichrome is needed. The chitin shell dyes bright red with trichrome stain and bright violet with gram staining.[1,6]

• ***Treatment.*** Although there is no standardized treatment, several studies suggest the use of oral albendazole (400mg PO BID for two to four weeks) in conjunction with topical fumagillin (3mg/ml drops every one to four hours for 10 days).[8,11] However, topical fumagillin is not commercially available and must be compounded, making it rather expensive. Albendazole is an anthelmintic that acts on the microtubules of the microsporidia to prevent further proliferation, whereas fumagillin is an antibiotic derived from *Aspergillus fumigatus*. Fumagillin's mechanism of action involves inhibiting metalloprotease methionine aminopeptidase type 2 and endothelial formation.[8,12]

Newer studies suggest that using a topical fluoroquinolone as monotherapy may be a viable first-line therapeutic approach.[1] As mentioned earlier, microsporidia have recently been classified as fungi; but upon genetic sequencing, a partial encoding for topoisomerase IV was identified in some microsporidial species.[13] As we know, fourth-generation fluoroquinolones inhibit DNA gyrase and topoisomerase IV in bacteria, which make them an effective choice.[13]

Methicillin-Resistant *Staphylococcus Aureus*

A 50-year-old white male, recently hospitalized, presented with a nonspecific conjunctivitis that was not responding to topical moxifloxacin.

• ***Diagnostic data.*** Pertinent exam findings include visual acuity of 20/30 OD and 20/25 OS. There was visible discharge (OS>OD) with diffuse keratitis and bilateral, mild, upper lid swelling. The anterior chambers were quiet. The patient reported that, while in the hospital, he had been treated for a MRSA skin infection, which raised suspicion of resistant bacterial conjunctivitis.

Fluctuations in antimicrobial resistance among ocular pathogens have received widespread attention, concerning ophthalmic practitioners and surgeons alike.

Since the very introduction of antibiotics in the 1940s, antimicrobials have been inciting new strains of bacterial resistance.[14]

In 1959, researchers developed methicillin, a narrow-spectrum, second-generation penicillin that is insensitive to the B-lactamase enzyme.[15] Specifically, it acts by inhibiting penicillin-binding proteins that synthesize the bacteria's much-needed thick cell wall. Its unique

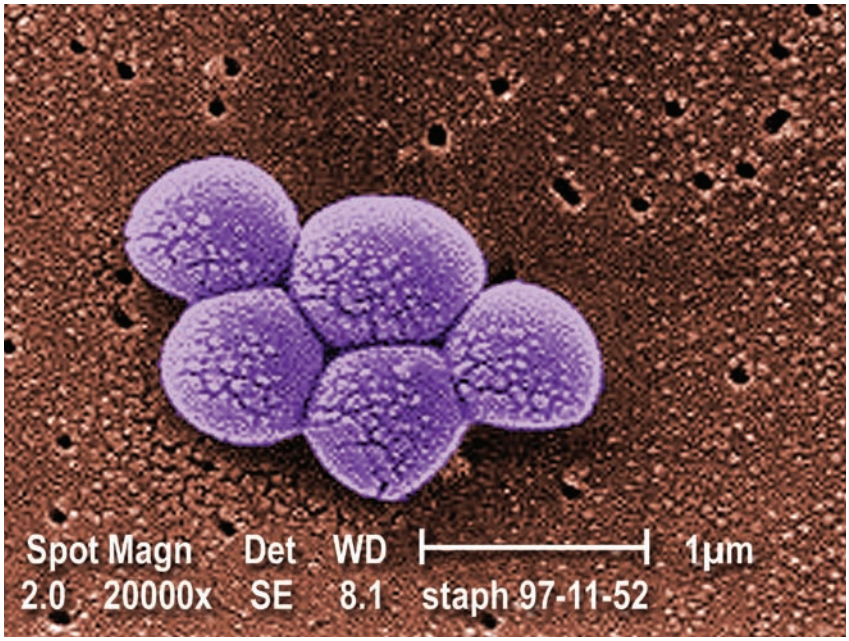


Image: CDC/Janice Haney Carr

Scanning electron micrograph depicting a group of MRSA bacteria. Note the thickened cell wall material seen as clumps on the organisms' surface.

disruptive ability made it exceptionally effective against various strains of the gram-positive *Staphylococcus aureus*.[14]

By 1961, a strain of *Staphylococcus* was discovered that was essentially impervious to methicillin, earning the name methicillin-resistant *Staphylococcus aureus* (MRSA).[14]

During the last several years, other drug-resistant forms of *Staphylococcus aureus* have emerged, including strains resistant to both erythromycin and, as in the case above, the fluoroquinolones.[16,17]

S. aureus is ubiquitous; it resides on the skin and mucous membranes of approximately one-third to one-half of all healthy adults.[18] Problems may arise when tissue barrier integrity is broken via surgical means, trauma and/or decreased immunocompetency.

The presence of MRSA-related complications have been widely publicized—and prior to 2006, these had been increasing at an alarming rate. But recently the Centers for Disease Control and Prevention (CDC) reported that MRSA "superbug" infections have begun to decline. Data from the CDC claim that invasive MRSA infections that began in hospitals had declined 28% from 2005 through 2008.[19] This number mirrors data from the National Healthcare Safety Network (NHSN) that found that rates of MRSA bloodstream infections fell nearly 50% from 1997 to 2007.[19]

This successful decline has not yet been verified in ophthalmic statistics. One study conducted in northern California from 1998 to 2006 found a 12.6% increase in ocular MRSA.[20] Also, a study in south Florida found that MRSA had increased by 38% between 1994 and 2003.[21]

The most recent data from the Ocular TRUST (Tracking Resistance in the US Today) study in 2008, the world's largest collection of surveillance data on eye infections, showed that more than 50% of *S. aureus* ocular isolates were identified as MRSA.[22] More recently, the ARMOR (Antibiotic Resistance Monitoring in Ocular micRorganisms) 2009 surveillance study showed that a number of bacterial isolates (such as *S. aureus, S. pneumoniae, H. influenzae* and *P. aeruginosa*) were resistant to one or more antibiotics.[23]

Individual practitioners, mostly in hospital settings, have also claimed an increase in recent MRSA-ocular infections; however, these reports have yet to be substantiated with a large, multicenter study.

The spectrum of eye disease and possible complications caused by methicillin-resistant *Staphylococcus aureus* are vast. One study from UCLA quantified its ocular manifestations as 78% blepharoconjunctivitis, 14.6% keratitis, 2.4% cellulitis, 2.4% dacryocystitis and 2.4% endophthalmitis.[20] General reports state that the most reported MRSA infection is conjunctivitis, while the least common is endophthalmitis.[24]

• ***Diagnosis.*** Distinguishing MRSA from non-MRSA-related eye complications can be difficult. Some study authors recommend performing scrapings, cultures and sensitivities of all ulcer and conjunctivitis cases, as using the appropriate antibiotics is correlated with not only a more favorable clinical outcome, but can also delay the emergence of resistance.[14,25]

• ***Treatment.*** Treatment for suspected MRSA ocular infections may require a combination of topical antibiotics—sometimes using both old and new regimens. Vancomycin is regarded as the gold standard and treatment of first choice for a MRSA infection.[14,20] A newer fluoroquinolone, Zymaxid (gatifloxacin, Allergan), has been found to be more effective against MRSA, though its susceptibility has gradually declined.[16] Another new member of the topical fluoroquinolone family is Besivance (besifloxacin, Bausch + Lomb), which is highly

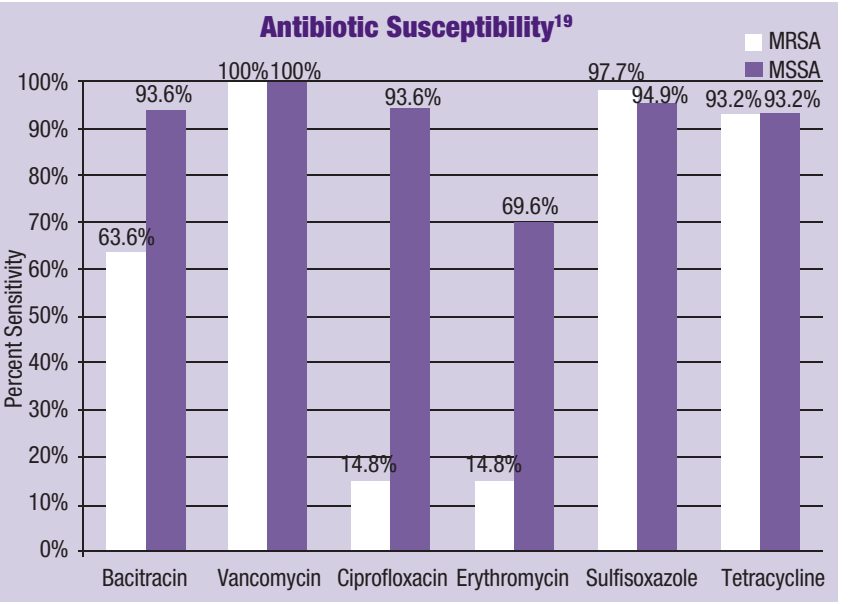
potent against gram-positive pathogens. It is unique in that it has been developed exclusively for ophthalmic use and has no systemic equivalent, which will presumably delay resistance.[26]

Other drugs that have shown excellent susceptibility against MRSA ocular infections include bacitracin (excellent efficacy against many gram-positive pathogens), sulfamethazole and Polytrim (polymixin B/trimethoprim, Allergan, and generic).[14,16,20]

Vancomycin, a glycopeptide antibiotic, is unique in both its size and mechanism of action. It is a very large and rigid molecule and has very specifically configured attachment sites, making it both robust and selectively toxic.[27] Even more importantly, its bulky inhibitory role in the disruption of bacterial cell wall synthesis renders the acquisition of resistance to glycopeptides more difficult than to other antibiotic groups.[27]

Unfortunately, a few recent cases of MRSA infections have been resistant to the treatment of vancomycin—dubbed vancomycin-resistant *S. aureus* (VRSA). The first case came to light in 1996, with fortunately fewer than a dozen subsequent cases.[28] Treatment for VRSA is still under significant discussion, but primarily focuses on oral trimethoprim/sulfamethazole; other options are IV daptomycin, linezolid and rifampin, to name a few.[28-30]

The gradual decline in systemic MRSA incidence likely has had a number of contributing factors. In 2006, the CDC published a 74-page manual on preventing the spread of drug-resistant organisms.[31] The Society for the Healthcare Epidemiology of America (SHEA) has recommended daily cleaning of high-touch surfaces, in addition to frequent hand washing, and isolating sick patients immediately.[14,31,32] Both



Sensitivity to antibiotics in ocular infections with methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA). Against MRSA, vancomycin reigns superior in its treatment spectrum and susceptibility.

such precautions, as well as vigilance from medical practitioners to appropriately treat suspected MRSA infections, will hopefully continue the current downward trend of resistance incidence.

Syphilis

A 75-year-old black male presented with complaints of light sensitivity, pain and redness that had been worsening for the past week.

• ***Diagnostic data.*** Pertinent exam findings include visual acuity of 20/40 OD and 20/80 OS. Anterior segment evaluation revealed corneal edema (OS>OD), anterior chamber reaction 3+ OS and 2+ OD with diffuse keratic precipitates, and minor cells in the vitreous of each eye. Funduscopic examination revealed a patch of "ground glass" peripheral retinitis in the left eye.

Based on the presentation of panuveitis, syphilis was high on our differential diagnosis list, so blood work was ordered.

Syphilis is a chronic, sexually-transmitted systemic infection caused by the bacterial spirochete *Treponema pallidum*. It is often spread through miniscule abrasions in mucous membranes of skin, and then rapidly enters the bloodstream to disseminate to other tissues.[33] It then passes through a complicated mélange of three stages; these may present in isolation, or overlap, or appear simultaneously. Initial infection with *T. pallidum* presents with a painless local chancre for three to six weeks, which after healing may be followed by a maculopapular rash and additional systemic symptoms, like malaise, weight loss, lymphadenopathy, alopecia, meningitis, ocular inflammation and gastric dysmotility, to name a few.[33,34]

Tertiary syphilis may present from one year through 46 years post-inoculation and may manifest as benign as localized granulomatous reactions or as morbid as cardiovascular and neurologic involvement.[33-35] Neurosyphilis may present at any stage (although rarely early).

Ocular manifestations of syphilis are variable and may occur at any

stage of the disease.[35] Numerous authors have reported the ability of *T. pallidum* to mimic a variety of ocular disorders, which can lead to misdiagnosis, delay in treatment and possible worsening of the condition.[35-37]

What can be more diagnostically challenging than an infectious process that can present at any stage of its evolution and may affect, in essence, any segment of the eye? Syphilis can affect the cornea, conjunctiva, sclera, lens, uvea, retina, retinal vasculature and even the cranial nerves.[35,37,38] The most common presentation of syphilis in the eye is uveitis and episcleritis; isolated episcleritis or scleritis is uncommon at any stage.[35,36] The most common retinal presentation is chorioretinitis, which is often associated with a variable amount of vitreal inflammation.[35]

One case series reported ocular manifestations of syphilis as granulomatous iridocyclitis (46%), nongranulomatous iridocyclitis (25%), panuveitis (13%), posterior uveitis (8%) and keratouveitis (8%).[36] Another study reported a rare case series of acute syphilitic posterior placoid chorioretinitis (ASPPC), where only 44 previously published cases were identified.[39]

Not all of these conditions present in isolation; anterior segment inflammation may remain confined to the cornea and anterior chamber, or it may move posteriorly, or (to complicate diagnosis) it may begin posteriorly altogether. A classic syphilitic ocular finding is the Argyll-Robertson pupil, which is most common late in the disease.[35,36] Here, the pupils are unequal, irregular and miotic with light-near dissociation—helpful in diagnosis, though other ocular conditions may also present with similar pupils.[35] This ambiguity in clinical presentation may render it difficult to rule out syphilis as a cause of ocular inflammation based solely on clinical presentation, so it's wise to include testing for syphilis.[35-38]

• ***Diagnosis.*** Take note that because *T. pallidum* cannot be cultured, diagnosis of syphilis requires serological testing.[34,35] Patients suspected of having syphilis are often initially screened with nontreponemal tests, including the venereal disease research laboratory (VDRL) and rapid plasma reagin (RPR) tests.[34] Those who test positive for VDRL or RPR may need to undergo specific treponemal testing, such as the fluorescent treponemal antibody absorption assay (FTA-ABS) and *Treponema pallidum* particle agglutination (TP-PA) test.[34] The CDC also recommends that patients with syphilitic ophthalmic manifestations undergo CSF evaluation.[35,38,40]

• ***Treatment.*** The recommended treatment for systemic syphilis, as detailed by the CDC, is parenteral penicillin—the preparation, dose and duration are determined by the stage or clinical manifestation.[34,40] Standard treatment includes injection of benzathine penicillin G (BPG); intravenous penicillin is used for neurosyphilis.[33,36,40] Patients who are allergic to the penicillins may be given combinations of doxycycline, tetracycline, ceftriaxone and azithromycin.[34,40]

The recommended management of ocular syphilis is to diagnose the disease and treat systemically first, although adjunctive steroid therapy may also be of use.[35] In cases of interstitial keratitis and anterior uveitis, topical steroids may accelerate resolution.[35,37,38] In cases of posterior uveitis, scleritis and optic neuritis, oral or IV steroids may help.[35,37,38] Ultimately, only correctly dosed systemic antibiotics can render true recovery.

Why does this complex disease merit our attention today? According to the latest numbers from the CDC, syphilis cases have been increasing since their lowest recorded level in 2000.[41,42] The current increase, says the CDC, is thought to reflect recent syphilis outbreaks among men who have sex with men (MSM), and the true numbers may still be underreported.[41,42]

The number of syphilis cases diagnosed by eye doctors is unknown, but because visual changes can be a common presenting symptom, it is possible that ocular syphilis is also on the rise. Indeed, two recent studies, one in the UK and one in California, have suggested an increased incidence of syphilitic uveitis.[37,38]

As stated above, syphilis does not have pathognomonic ophthalmic features. Its presenting ocular signs are often nonspecific and may escalate to cause significant visual disturbances. But, once correctly diagnosed, syphilis is eminently treatable. It is important to be aware that syphilis is on the rise and to remain appropriately vigilant in cases of complex ocular inflammation.

Non-Hodgkin's Lymphoma

A 72-year-old white male presented with complaints of decreased vision in the left eye. The patient reported no known drug allergies and was on the following medications: metoprolol, amlodipine, simvastatin and terazosin. He was not using any topical medications.

• ***Diagnostic data.*** On examination, visual acuity with correction was 20/25 OD and 20/100 OS. Intraocular pressure measured 15mm Hg OU. Slit-lamp examination revealed a clear cornea in the right eye. The left cornea had multiple keratic precipitates, some of which were mutton fat. The anterior chamber of the left eye had 1+ cell and flare; the anterior chamber of the right eye was clear. The patient

was pseudophakic in both eyes.

Funduscopic examination was performed in both eyes. In the right eye, the cup-to-disc ratio was 0.3. The macula had pigmentary changes. The vessel and periphery were without any abnormality. The vitreous was clear. In the left eye, the view was quite hazy secondary to the presence of cells. There were several sheets of cells present. Circulating cells were also noted.

• ***Diagnosis.*** In this case, the diagnosis of intraocular lymphoma was difficult. Patients usually present with vague complaints of blurred vision, metamorphopsia and floaters. Examination findings are that of a chronic, unresolving uveitis or vitritis that can be unilateral or bilateral.[43]

Ocular signs of primary vitreoretinal lymphoma disease include vitritis, RPE atrophy, subretinal yellow-white infiltrates and, less commonly, vasculitis, retinal artery occlusion, retinal detachment and optic atrophy.[44] Uveal lymphoma presents as thickening of the uveal wall, retinal detachment, vitreous cells, iris infiltrates and pseudohypopyon.[44]

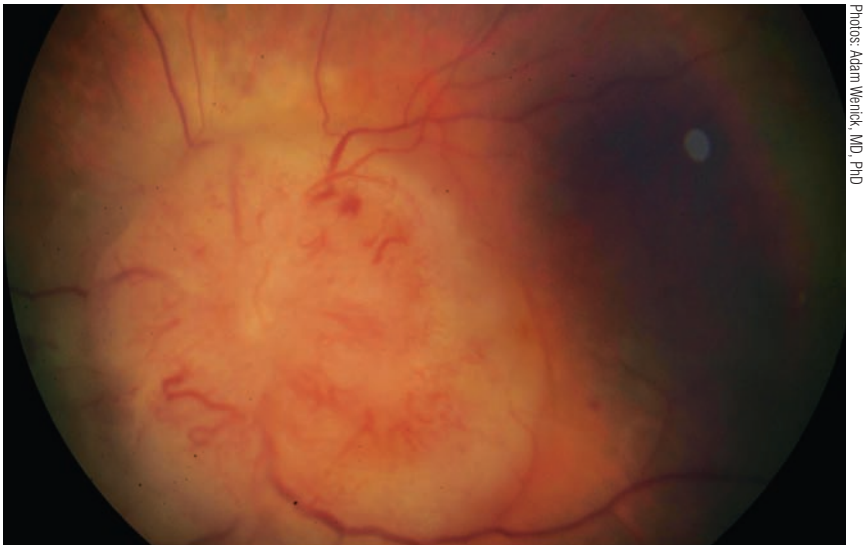
Intraocular lymphoma is a very rare condition, with fewer than 200 cases reported in the literature. However, it has been on the rise with annual increases of 6.2% to 6.5%.[43,45]

Intraocular lymphomas are almost always of the non-Hodgkin's variety.[44] They are usually B-cell lymphomas and are thought to be associated with the human herpesvirus-8 and *Toxoplasma gondii* in immunocompetent individuals, and the Epstein-Barr virus in the immunocompromised; however, the exact pathogenesis and etiology remains unknown.[46]

A primary intraocular lymphoma (PIOL) can precede CNS involvement, although PIOL is thought to be a subset of primary central nervous system lymphoma (PCNSL).[43] Ocular PCNSL tends to invade the optic nerve, retina and vitreous and is termed primary vitreoretinal lymphoma (PVRL).[44,46] Secondary intraocular lymphomas are systemic manifestations of non-Hodgkin's lymphoma (NHL) and often affect the uveal tract.[46]

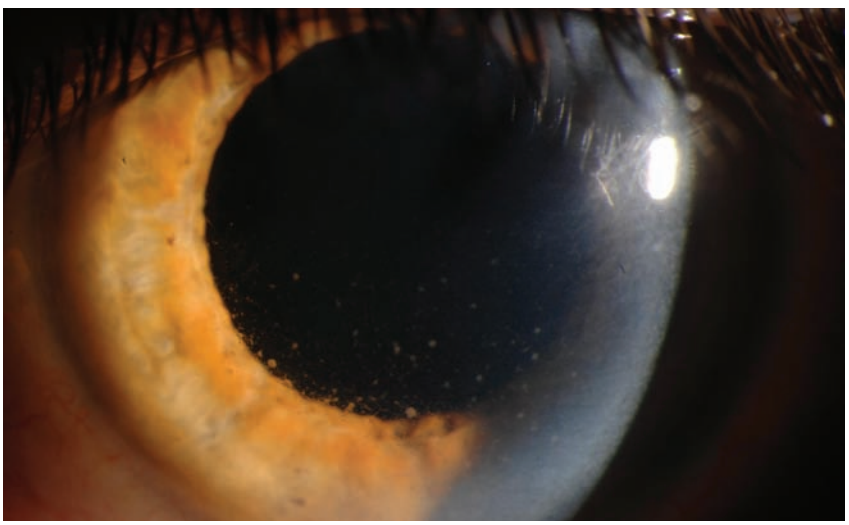
As mentioned earlier, the diagnosis of ocular lymphoma is rather difficult. The mean time of diagnosis from the onset of symptoms is 23 months.[47] The reason for this delay is that when a patient presents with a vitreous infiltrate, it is often misdiagnosed as a vitritis secondary to either infectious or inflammatory disease.[47]

To complicate matters further, the condition will initially respond to systemic and topical corticosteroid therapy.[47] Although the etiology of the vitreous response is lymphoid in nature, the lymphoma cells frequently carry a cytoplasmic steroid receptor that leads to cell lysis, which responds favorably to steroid therapy.[47] Several cycles of

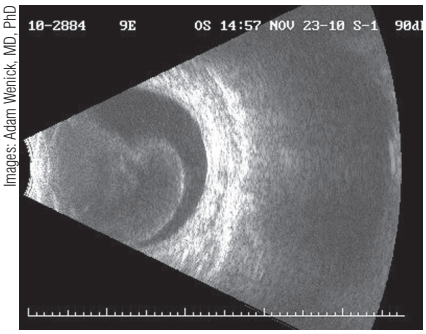


Photos: Adam Wenick, MD, PhD

Optic nerve involvement of B-cell non-Hodgkin's lymphoma.

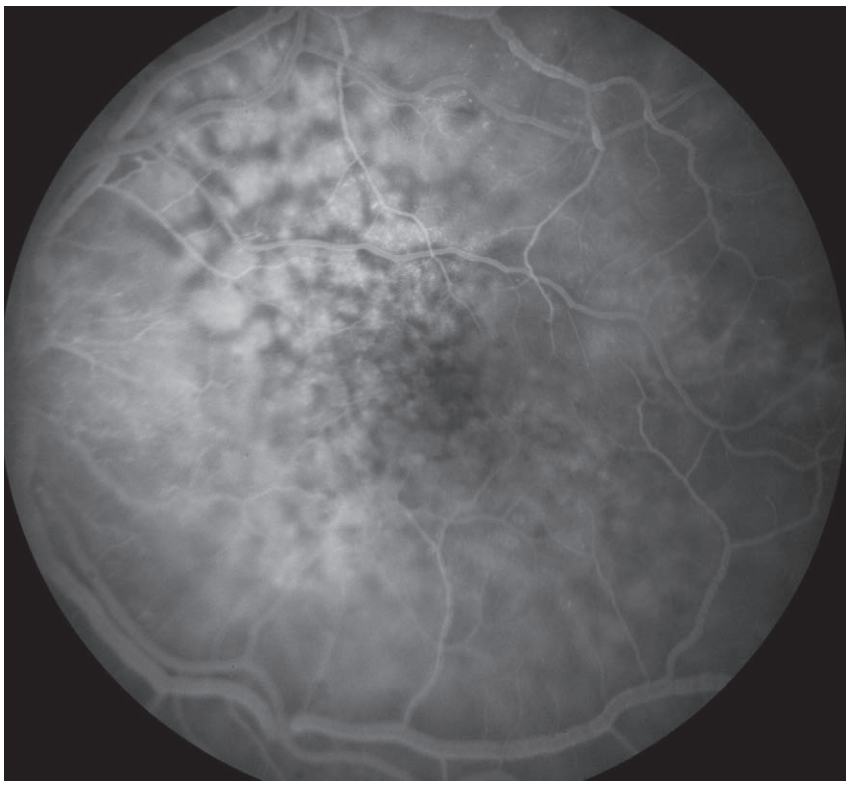


Anterior segment infiltration of ocular lymphoma.



Images: Adam Wenick, MD, PhD

B-scan shows dense vitreous opacities suggestive of ocular lymphoma.



In cases where vitreous cells obscure the retina, fluorescein angiography can be used to show areas of hyper- and hypofluorescence of the retinal pigment epithelium.

resolution and recurrence will occur before steroid therapy becomes ineffective, and thus prompt further testing.[47]

A vitrectomy along with blood work (including HIV test, *Toxoplasma* antibody titer, cytomegalovirus titer, angiotensin-converting enzyme, RPR test and TB skin test) is indicated to exclude inflammatory and infectious causes.[43,47] The vitreous sample should undergo cytology testing, B-cell marker testing and supernatant ratio of interleukin-10: interleukin-6.[47] (Interleukin-10 is a growth factor for B lymphocytes.[47])

In our patient, vitreous cells obscured the retina in the left eye. In such cases, fluorescein angiography can be used to show areas of hyper- and hypofluorescence at the level of the RPE, and B-scan ultrasonography can show vitreous infiltrates and B-cell lesions.[47] If the vitreous analysis findings demonstrate evidence of B-cell lymphoma (as in our patient), then an MRI (along with a lumbar puncture and analysis of the cerebral spinal fluid) is indicated to look for lymphoma lesions of the brain.[48]

• ***Treatment.*** Due to the rarity of primary ocular lymphoma, the literature on treatment is limited to several case studies.[44] The main goal of therapy is to preserve vision and to prevent it from spreading to the central nervous system.[45] Still, CNS involvement is common because of the typical delay in diagnosis.[45]

Because surgery is not a viable option, systemic and ocular chemotherapy are the first lines of treatment.[44] Intravitreal injections of methotrexate and rituximab have been shown to be effective and well tolerated, with rare side effects (including vitreous hemorrhage, retinal detachment, cataracts and infection).[44,45] Systemic chemotherapy with a combination of cytarabine, methotrexate and rituximab has also been shown effective and is often used on those with CNS involvement.[44,49]

Methotrexate has been used successfully to treat a variety of cancers. First introduced in the 1940s, methotrexate induces apoptosis of the cancer cells.[49] It leads to the successful remission of acute lymphoblastic leukemia (ALL) in children, and is still used to this day to treat ALL, certain lymphomas and osteosarcoma.[50]

Rituximab is a new kid on the block. It gained FDA approval in October 2012 and has recently become the go-to chemotherapy agent in B-cell malignancies.[51,52] Rituximab is monoclonal antibody that results in a stimulation of apoptosis and sensitization of tumor cells, although the exact mechanism is unknown.[52] In vitro studies show that rituximab targets CD20 cells, which produce protein kinase essential to the antiapoptotic survival pathways.[52]

In cases where intravitreal or systemic chemotherapy is insufficient, radiation of the posterior two-thirds of the globe is indicated.[47] Radiation-related side effects include keratitis, cataract, glaucoma, optic neuropathy and retinopathy.[44,47]

The patient in this case refused chemotherapy, and came in for monthly rituximab injections to

maintain the vision he had. Sadly, he passed away a few months after diagnosis.

If one hears horse hooves, why consider a zebra? Because these zebras can have dangerous, resounding systemic effects. The reemergence of old adversaries in eye care may require us to re-evaluate our list of common differentials.

All four of the conditions described here require systemic investigation. All of these situations could necessitate multidisciplinary involvement—including pathologists, internists, oncologists and radiologists—and may even require hospitalization. Timely diagnosis is critical, not only from an ophthalmic standpoint but also in consideration of the whole individual.

Long gone are the days when optometrists were practitioners solely concerned with the optical quality of patients' vision. We are doctors who diagnose, treat and medically manage a wide array of medical eye conditions. In most states, we can prescribe oral medications. But in every state, we are permitted to diagnose, topically treat, and collaborate with a team of practitioners to best manage our patients. We may be the patient's first entry into the health care system, and so we must be especially vigilant when presented with ocular signs that may stem from systemic problems. ■

Dr. Fabrykowski is on staff at the Manhattan Eye, Ear and Throat Hospital Faculty Ophthalmology Practice, operated by Lenox Hill Hospital, in New York.

Dr. Laul is an instructor of ophthalmology at the Wilmer Eye Institute, Johns Hopkins School of Medicine, in Baltimore.

The authors thank Amilia Schrier, MD, Gaetano Barile, MD, Majed Alkharashi, MBBS, and Adam Wenick, MD, PhD, for their assistance with this article.

1. Loh RS, Chan CM, Ti SE, et al. Emerging prevalence of microsporidial keratitis in Singapore: epidemiology, clinical features, and management. Ophthalmology. 2009 Dec;116(12):2348-53.
2. Vemuganti GK, Garg P, Sharma S, et al. Is microsporidial keratitis an emerging cause of stromal keratitis? A case series study. BMC Ophthalmol. 2005 Aug 17;5:19.
3. Centers for Disease Control and Prevention. Epidemiologic notes and reports microsporidian keratoconjunctivitis in patients with AIDS. Morbidity and Mortality Weekly Report. March 23, 1990; 39(11);188-189. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00001578.htm. Accessed March 17, 2013.
4. Chang L, Smith S. Parasites and Pestilence: Infectious Public Health Challenges, Mircosporidia. Available at: www.stanford.edu/class/humbio103/ParaSites2006/Microsporidiosis/microsporidia1.html. Accessed March 17, 2013.
5. Centers for Disease Control and Prevention. Laboratory Identification of Parasites of Public Health Concern: Microsporidiosis. Available at: http://dpd.cdc.gov/dpdx/HTML/Microsporidiosis.htm. Accessed March 17, 2013.
6. Valda CM. Microsporidiosis. Medscape Reference. Updated January 11, 2012. Available at: http://emedicine.medscape.com/article/221631-overview. Accessed March 17, 2013.
7. Barton CE, Phalen DN, Snowden KF. Prevalence of microsporidian spores shed by asymptomatic lovebirds: evidence for potential emerging zoonosis. J. Avian Med Surg. 2003. 17(4):197-202.
8. Tham AC, Sanjay S. Clinical spectrum of microsporidial keratoconjunctivitis. Clin Experiment Ophthalmol. 2012 Jul;40(5):512-8.
9. Lam T, Wong M, Chuang S. Microsporidial keratoconjunctivitis outbreak among athletes from Hong Kong who visited Singapore, 2012 [letter]. Emerg Infect Dis [Internet]. 2013 Mar;19(3). Available at: wwwnc.cdc.gov/eid/article/19/3/12-1150_article.htm. Accessed March 17, 2013
10. Mietz H, Franzen C, Hoppe T, Bartz-Schmidt KU. Microsporidia-induced sclerouveitis with retinal detachment. Arch Ophthalmol. 2002 Jun;120(6):864-5.
11. Garvey MJ, Ambrose PG, Ulmer JL. Topical fumagillin in the treatment of microsporidial keratoconjunctivitis in AIDS. Ann Pharmacother. 1995 Sep;29(9):872-4.
12. Sin N, Meng L, Wang MQ, et al. The anti-angiogenic agent fumagillin covalently binds and inhibits the methionine aminopeptidase, MetAP-2. Proc Natl Acad Sci USA. 1997 Jun 10;94(12):6099-103.
13. Didier ES, Bowers L, Stovall ME, et al. Antimicrosporidial activity of (fluoro)quinolones in vitro and in vivo. Folia Parasitol (Praha). 2005 May;52(1-2):173-81.
14. Dunbar MT, Parker JS. Win the battle against MRSA. Rev Optom. 2009 Feb;146(2):69-74.
15. Stapleton PD, Taylor PW. Methicillin resistance in Staphylococcus aureus: mechanisms and modulation. Sci Prog. 2002;85(Pt 1):57-72.
16. Adebayo A, Parikh JG, McCormick SA, et al. Shifting trends in in vitro antibiotic susceptibilities for common bacterial conjunctival isolates in the last decade at the New York Eye and Ear Infirmary. Graefes Arch Clin Exp Ophthalmol. 2011 Jan;249(1):111-9.
17. Abelson MB, Forte J, Shapiro A. MRSA: It's not just resistant to methicillin. Rev Ophthalmol. 2008 Sep;15(9):82-85.
18. Casewell MW, Hill RL. The carrier state: methicillin-resistant Staphylococcus aureus. J Antimicrob Chemother. 1986 Jul;18 Suppl A:1-12.
19. Centers for Disease Control and Prevention. MRSA Statistics. Updated April 8, 2011. Available at: www.cdc.gov/mrsa/statistics/index.html. Accessed March 25, 2013.
20. Freidlin J, Acharya N, Lietman TM, et al. Spectrum of eye disease caused by methicillin-resistant Staphylococcus aureus. Am J Ophthalmol. 2007 Aug;144(2):313-5.
21. Cavuoto K, Zutshi D, Karp CL, et al. Update on bacterial conjunctivitis in South Florida. Ophthalmology. 2008 Jan;115(1):51-6.
22. Asbell PA, Colby KA, Deng S, et al. Ocular TRUST: Nationwide antimicrobial susceptibility patterns in ocular isolates. Am J Ophthalmol. 2008 Jun;145(6):951-958.
23. Haas W, Pillar CM, Torres M, et al. Monitoring antibiotic resistance in ocular microorganisms: results from the Antibiotic Resistance Monitoring in Ocular micRorganisms (ARMOR) 2009 surveillance study. Am J Ophthalmol. 2011 Oct;152(4):567-74.
24. Asbell PA, Blomquist PH, Donnenfeld ED, et al. Community-acquired MRSA a growing problem in ophthalmology. Ocular Surgery News. 2009 June 25.
25. Hawkes CA. Antibiotic resistance: a clinician's perspective. Mil Med. 2000 Jul;165(7 Suppl 2):43-5.
26. Sharma S. Antibiotic resistance in ocular bacterial pathogens. Indian J Med Microbiol. 2011 Jul-Sep;29(3):218-22.
27. Reynolds PE. Structure, biochemistry and mechanism of action of glycopeptide antibiotics. Eur J Clin Microbiol Infect Dis. 1989 Nov;8(11):943-50.
28. Cui L, Hiramatsu K. Vancomycin-resistant Staphylococcus aureus. In: Fluit AC, Schmitz FJ, eds. MRSA: Current Perspectives. Norfolk, England: Caister Academic; 2003: 187-212.
29. Adra M, Lawrence KR. Trimethoprim/sulfamethoxazole for treatment of severe Staphylococcus aureus infections. Ann Pharmacother. 2004 Feb;38(2):338-41.
30. Finks J, Wells E, Dyke TL, et al. Vancomycin-resistant Staphylococcus aureus, Michigan, USA, 2007. Emerg Infect Dis. 2009 Jun;15(6). Available at wwwnc.cdc.gov/eid/article/15/6/08-1312.htm. Accessed March 25, 2013.
31. Siegel JD, Rhinehart E, Jackson M, Chiarello L; Healthcare Infection Control Practices Advisory Committee. Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006. Centers for Disease Control and Prevention. Available at: www.cdc.gov/hicpac/pdf/MDRO/MDROGuideline2006.pdf. Accessed March 28, 2013.
32. Kundrapu S, Sunkesula V, Jury LA, et al. Daily disinfection of isolation rooms reduces contamination of healthcare workers' hands. Infect Control Hosp Epidemiol. 2012 Oct;33(10):1039-42.
33. Ho EL, Lukehart SA. Syphilis: Using modern approaches to understand an old disease. J Clin Invest. 2011 Dec;121(12):4584-92.
34. Mattei PL, Beachkofsky TM, Gilson RT, Wisco OJ. Syphilis: A reemerging infection. Am Fam Physician. 2012 Sep 1;86(5):433-40.
35. Kiss S, Damico FM, Young LH. Ocular manifestations and treatment of syphilis. Semin Ophthalmol. 2005 Jul-Sep;20(3):161-7.
36. Barile GR, Flynn TE. Syphilis exposure in patients with uveitis. Ophthalmology. 1997 Oct;104(10):1605-9.
37. Fonollosa A, Giralt J, Pelegrín LS. Ocular syphilis—back again: understanding recent increases in the incidence of ocular syphilitic disease. Ocul Immunol Inflamm. 2009 May-Jun;17(3):207-12.
38. Doris JP, Saha K, Jones NP, Sukthankar A. Ocular syphilis: the new epidemic. Eye (Lond). 2006 Jun;20(6):703-5.
39. Eandi CM, Neri P, Adelman RA, et al; International Syphilis Study Group. Acute syphilitic posterior placoid chorioretinitis: report of a case series and comprehensive review of the literature. Retina. 2012 Oct;32(9):1915-41.
40. Centers for Disease Control and Prevention. Sexually Transmitted Diseases (STDs). Syphilis Treatment and Care. Available at: www.cdc.gov/std/syphilis/treatment.htm. Updated: 2013 May 22. Accessed Accessed August 9, 2013.
41. Chao JR, Khurana RN, Fawzi AA, et al. Syphilis: reemergence of an old adversary. Ophthalmology. 2006 Nov;113(11):2074-9.
42. Centers for Disease Control and Prevention. 2011 Sexually Transmitted Diseases Surveillance. Syphilis. Available at: www.cdc.gov/std/stats11/syphilis.htm. Updated: 2013 Dec 13. Accessed April 18, 2013.
43. Menon-Mehta S. Ocular Lymphoma. Medscape Reference. http://emedicine.medscape.com/article/1219134-overview. Updated: June 3, 2013. Accessed August 9, 2013.
44. Turell ME, Singh AD. Diagnosis & treatment of intraocular lymphoma. Rev Ophthalmol. 2012 Jan;19(1):40-47.
45. Moslehi R, Devesa SS, Schairer C, Fraumeni JF Jr. Rapidly increasing incidence of ocular non-Hodgkin lymphoma. J Natl Cancer Inst. 2006 Jul 5;98(13):936-9.
46. Jahnke K, Thiel E, Abrey LE, et al. Diagnosis and management of primary intraocular lymphoma: an update. Clin Ophthalmol. 2007 Sep;1(3):247-58.
47. Hormigo A, DeAngelis LM. Primary ocular lymphoma: clinical features, diagnosis, and treatment. Clin Lymphoma. 2003 Jun;4(1):22-9.
48. Peterson K, Gordon KB, Heinemann MH, DeAngelis LM. The clinical spectrum of ocular lymphoma. Cancer. 1993 Aug 1;72(3):843-9.
49. Chamberlain MC, Johnston SK. High-dose methotrexate and rituximab with deferred radiotherapy for newly diagnosed primary B-cell CNS lymphoma. Neuro Oncol. 2010 Jul;12(7):736-44.
50. Chabner B, Thomas R. Chemotherapy and the war on cancer. Nature Reviews Cancer. 2005;5(1):65-72.
51. US Food and Drug Administration. Rituximab infusion. Available at: www.fda.gov/Drugs/InformationOnDrugs/ApprovedDrugs/ucm324890.htm. Updated October 22, 2012. Accessed May 5, 2013.
52. Weiner G. Rituximab: mechanism of action. Semin Hematol. 2012 April; 47(2):115-23.

OSC QUIZ

You can obtain transcript-quality continuing education credit through the Optometric Study Center. Complete the test form *(page 89)*, and return it with the $35 fee to: Optometric CE, P.O. Box 488, Canal Street Station, New York, NY 10013. To be eligible, please return the card within one year of publication.

You can also access the test form and submit your answers and payment via credit card at *Review of Optometry* online, www.revoptom.com.

You must achieve a score of 70 or higher to receive credit. Allow eight to 10 weeks for processing. For each Optometric Study Center course you pass, you earn 2 hours of transcript-quality credit from Pennsylvania College of Optometry and double credit toward the AOA Optometric Recognition Award—Category 1.

Please check with your state licensing board to see if this approval counts toward your CE requirement for relicensure.

1. How many different types of microsporidial species have been identified?
a. 100.
b. 500.
c. 1,000.
d. 1,500.

2. Microsporidia can invade the eye via direct contact with:
a. Contaminated soil.
b. Contaminated water.
c. Both a and b.
d. Microsporidia do not spread via direct contact.

3. Microsporidia are highly resistant to environmental damage due to the:
a. Hydrophobic cell membrane.
b. Chitin layer.
c. Xylum layer.
d. Pectin layer.

4. Site of infection by microsporidia includes:
a. Respiratory system.
b. Brain.
c. Urinary tract.
d. All of the above.

5. Which is an appropriate treatment for ocular microsporidia:
a. Topical fourth-generation fluoroquinolone.
b. Topical natacyn.
c. Topical ganciclovir.
d. Oral acyclovir.

6. *Staphylococcus aureus* is:
a. Gram negative.
b. Gram positive.
c. Neither gram positive nor gram negative.
d. Has both gram-positive and gram-negative qualities.

7. In healthy adults, *S. aureus* resides in the:
a. Gastrointestinal tract.
b. Skin and mucous membranes.
c. Lungs.
d. Lungs and gastrointestinal tract.

8. Which is the most common ocular manifestation of MRSA?
a. Blepharoconjunctivitis.
b. Dacryocystitis.
c. Endophthalmitis.
d. Keratitis.

9. Which is the treatment of first choice for ocular infection of MRSA?
a. Tobramycin.
b. Moxifloxacin.
c. Vancomycin.
d. Polymixin.

10. Vancomycin's primary mode of action of against bacteria is:
a. Disrupting cell wall synthesis.
b. Inhibiting DNA transcription.
c. Dissolving the cell wall.
d. Both inhibiting DNA transcription and dissolving the cell wall.

11. Syphilis is most commonly transmitted by which method?
a. Airborne/respiratory.
b. Sexual contact.
c. Sharing of hypodermic needles.
d. Both respiratory and sexual contact.

12. The etiology of *Treponema pallidum* is best described as:
a. Viral.
b. Protozoan.
c. Bacterial.
d. Fungal.

13. The most common isolated presentation of ocular syphilis is:
a. Blepharoconjunctivitis.
b. Episcleritis/scleritis.
c. Interstitial keratitis.
d. Uveitis.

14. Diagnosis of syphilis is best done by:
a. Serology.
b. In vitro culturing.
c. Serology and CSF testing.
d. In vitro culturing and serology.

15. Traditional treatment for systemic syphilis is:
a. Penicillin.
b. Prednisone.
c. Acetazolamide.
d. Penicillin and prednisone.

16. How many cases of primary intraocular lymphoma have been recorded?
a. 200.
b. 600.
c. 1,000.
d. 20,000.

17. In immunocompromised patients, what is the suspected cause of intraocular lymphoma?
a. Histoplasmosis.
b. Toxoplasmosis.
c. Epstein-Barr virus.
d. Human herpesvirus 8.

18. In primary intraocular lymphoma, what is the average time between onset of ocular

OSC QUIZ

findings until diagnosis?
a. Three months.
b. Six months.
c. About one year.
d. About two years.

19. What presentation does ocular lymphoma show on fluorescein angiography?
a. Hyper- and hypofluorescence.
b. Dark/silent choroid.
c. Neovascular changes in the far periphery.
d. None of the above.

20. Which is an appropriate therapy for intraocular lymphoma?
a. Intravitreal methotrexate.
b. Systemic methotrexate.
c. Intravitreal rituximab.
d. All of the above.

Important Notice: Processing Answer Sheets and CE Certificates

Review of Optometry is strengthening our commitment to the environment and "going green."

Effective September 2012, we will send the results of any CE post-course test that is manually submitted (via mail or fax) to the email address provided on your answer sheet.

If you do not provide an email address OR if you prefer to receive a hard copy of your certificate of completion via mail, you will be charged a $2.50 processing fee per certificate (via credit card or check payable to Jobson Medical Information LLC).

We cannot process your post-course test if neither an email address nor $2.50 processing fee is provided. Any answer sheet will automatically be returned to you.

We appreciate your support of this new process. Please contact us via email at cecustomerservice @jobson.com with any questions. Thank you!

TAKE THE TEST ONLINE TODAY!
www.revoptom.com/continuing_education/

Examination Answer Sheet

Valid for credit through September 1, 2016

This exam can be taken online at www.revoptom.com/CEname. Upon passing the exam, you can view your results immediately and download a real-time CE certificate. You can also view your test history at any time from the website.

Rare Presentations That Aren't That Rare Anymore

Directions: Select one answer for each question in the exam and completely darken the appropriate circle. A minimum score of 70% is required to earn credit.

Mail to: Jobson - Optometric CE, PO Box 488, Canal Street Station, New York, NY 10013

Payment: Remit $35 with this exam. Make check payable to Jobson Medical Information LLC.

COPE approved for 2 hours of CE credit. COPE ID# 38874-GO

This course is joint-sponsored by the Pennsylvania College of Optometry

There is an eight-to-ten week processing time for this exam.

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
16.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
17.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
18.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

1 = Excellent 2 = Very Good 3 = Good 4 = Fair 5 = Poor

Rate the effectiveness of how well the activity:

21. Met the goal statement: ① ② ③ ④ ⑤
22. Related to your practice needs: ① ② ③ ④ ⑤
23. Will help you improve patient care: ① ② ③ ④ ⑤
24. Avoided commercial bias/influence: ① ② ③ ④ ⑤
25. How would you rate the overall quality of the material presented? ① ② ③ ④ ⑤
26. Your knowledge of the subject was increased:
◯ Greatly ◯ Somewhat ◯ Little
27. The difficulty of the course was:
◯ Complex ◯ Appropriate ◯ Basic

How long did it take to complete this course? _____

Comments on this course:

Suggested topics for future CE articles:

Please retain a copy for your records. Please print clearly.

You must choose and complete one of the following three identifier types:

① SS # ___ - ___ - ____

Last 4 digits of your SS # and date of birth

② ____ - ____

State Code and License #: (Example: NY12345678)

③ _____

First Name _____

Last Name _____

E-Mail _____

The following is your: ☐ Home Address ☐ Business Address

Business Name _____

Address _____

City _____ State ____

ZIP _____

Telephone # ___ - ___ - ____

Fax # ___ - ___ - ____

By submitting this answer sheet, I certify that I have read the lesson in its entirety and completed the self-assessment exam personally based on the material presented. I have not obtained the answers to this exam by any fraudulent or improper means.

Signature _____ Date _____

Lesson 109344

RO-OSC-0913

INTERNATIONAL VISION EXPO & CONFERENCE LAS VEGAS

VEW: Doubling Down on Education

This year, the Las Vegas meeting's educational program focuses on glaucoma treatment and nutraceuticals. **By Jane Cole, Contributing Editor**

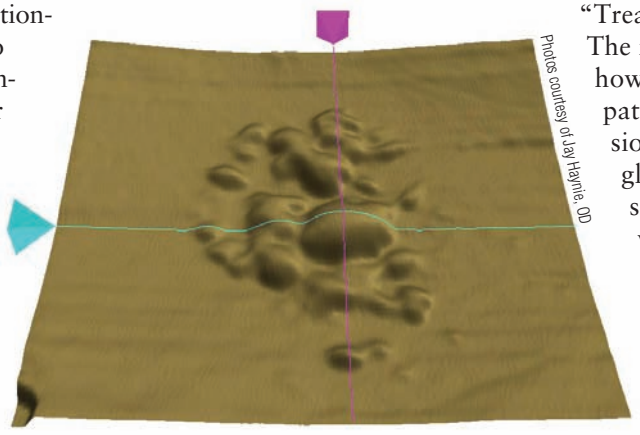
In the panoply of optometric conferences, it used to be that "Vision Expo" was synonymous with "Frames Expo" to many ODs. But in recent years, show organizers realized that more than 60 percent of its attendees were doctors in private practice engaged in medical aspects of eye care, and so ushered in the evolution of the semiannual conference as an emerging, formidable player in the continuing education of ODs.

This year's Vision Expo West, scheduled for Oct. 2-5 in Las Vegas, continues that repositioning effort. "We really had to change our curriculum extensively to compete with other meetings," says optometrist Kirk Smick, chair of the conference advisory board. The educational program will feature 325 hours of CE, representing a wide spectrum of courses ranging from "Understanding Spectral Domain OCT," to "Obamacare—Efficiency Through Technology."

VEW, which is co-owned by Reed Exhibitions and the Vision Council, will feature two new clinical specialities this year: 14 hours dedicated to the diagnosis and treatment of glaucoma and the debut of a nutraceutical track.

Glaucoma: Beyond the Diagnosis

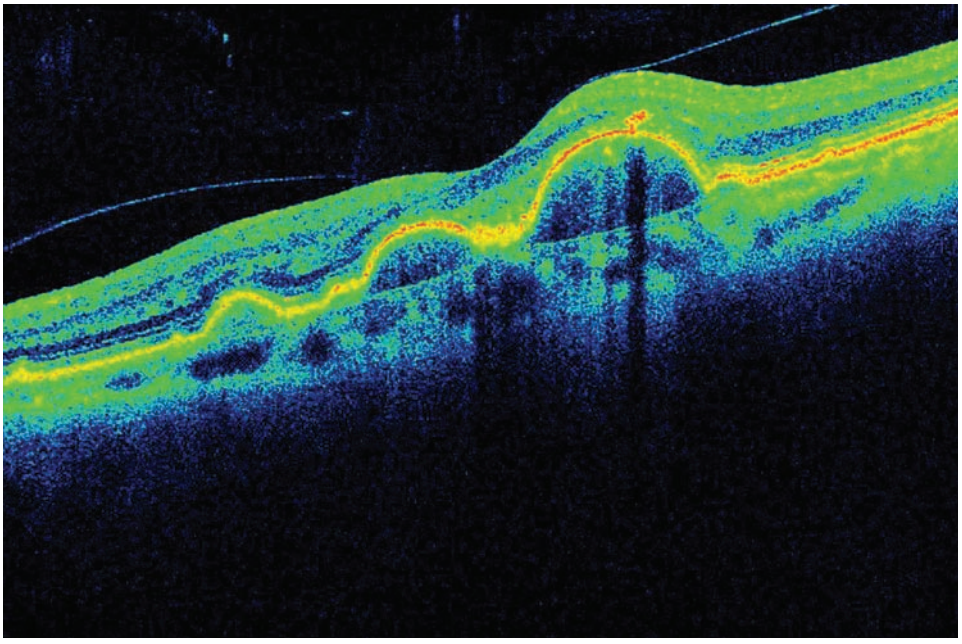
Many practicing ODs are adept at diagnosing glaucoma but tend to refer patients out for treatment. "So, we are trying to make it easier" for them to retain the patient, Dr. Smick says of the VEW glaucoma program. "The technology is changing, the drugs are changing, the theories are changing," he says. "If you've been testing the waters and are really ready to get going and get your feet wet, you can take this program and feel pretty comfortable about getting started in treating glaucoma patients."



Photos courtesy of Jay Haynie, OD

1. Using the RPE contour map with SD-OCT helps doctors see the topography of the RPE with retinal drusen and CNV formation.

Optometrist Michael Chaglasian and ophthalmologist Harvey Dubiner will present two glaucoma treatment courses, "Treatment Decisions Part I" and "Treatment Decisions Part II." The first session will discuss how to initiate therapy on patients with ocular hypertension, early stage open-angle glaucoma and normal tension glaucoma. The duo will review key risk factors such as 24-hour IOP, ocular perfusion pressure, and disc hemorrhages through case presentations. An overview of current topical medical therapy options will also be discussed, along with



2. Large drusen seen with SD-OCT.

the concepts of target pressure and monocular trials.

In their second course, attendees will learn how to manage a glaucoma patient over the first few years of treatment. Drs. Chaglasian and Dubiner will also cover visual fields and OCT data, how to identify signs of disease progression, and what indicators prompt the need for additional medical therapy. Options for adjunctive therapy along with their pros and cons will also be discussed, in addition to considerations such as when laser therapy or filtering surgery becomes an option.

Renowned lecturers Ron Melton, OD, and Randall Thomas, OD, will also take the stage in "Glaucoma Grand Rounds." This team-taught course will offer numerous patient presentations in a case-study/grand rounds format. Drs. Melton and Thomas will emphasize the diagnostic work-up, assessment of risk, selection of drug therapy and follow-up care.

Glaucoma expert Murray Fingeret, OD, will be on hand to share his insights during course "Visual Fields and New Tests." Dr. Fingeret will remind attendees that visual field tests are important in the diagnosis and management of glaucoma, and he will discuss the assessment of the visual field and signs of early loss, in addition to new forms of perimetry.

Of course, optometrists are often the best poised to first uncover undiagnosed glaucoma, as VEW presenter Leo Semes, OD, personally attests. "My grandfather was diagnosed with glaucoma when he went to his optometrist for a frame repair," Dr. Semes recalls. "He was successfully managed and was seeing at the end of his life."

Dr. Semes, who will co-present "Getting Comfortable with Glaucoma," along with Richard Madonna, OD, says optometrists have the opportunity to document with fundus photography, for example, the status of the optic nerve in those who are suspicious for glaucoma based on any of the known risk factors. These include elevated IOP as well as other clinical findings that may be characteristic of early glaucoma.

(continued on page 110)

VEW 2013: Just the Facts

The 25th annual International Vision Expo West will be held in Las Vegas Oct. 2-5, 2013 (education: Oct. 2-5, exhibition: Oct. 3-5) at the Sands Expo & Convention Center.

The four-day conference will feature more than 325 hours of continuing education, focused on three core competencies — disease diagnosis, treatment and management; clinical application of products; and healthy business solutions.

Attendees can visit 475 exhibitors featuring 5,000 brands in the 190,000 square feet of exhibit space.

Onsite navigation and technology: **My Show Planner Online Tool** and onsite kiosks allows attendees to search for products and exhibitors, contact exhibitors for appointments, and create agendas and maps of the floor plan to ease navigation at the show. With MyNetwork, a new feature this year, you can search for other registered attendees to expand network opportunities. Also, use Vision Expo Mobile (www.visionexpomobile.com) through your mobile device to integrate your My Show Planner account. It also includes an interactive map.

Additional details are available at www.visionexpowest.com.

Can You Nail This Diagnosis?

Because the patient's vision is good, an intraocular foreign body doesn't seem likely—or does it? **Edited by Paul C. Ajamian, OD**

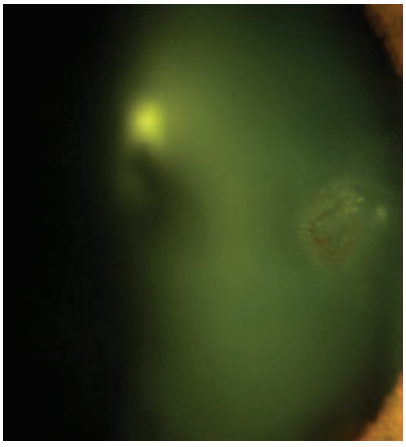
Q I have a patient who I suspect might have an intraocular foreign body, but his vision is normal. Does this make sense?

A Although uncommon, it's possible and it must be considered. Indeed, "most patients with foreign bodies who present to a primary care office have good vision," says optometrist Brian Den Beste, of Orlando, Fla. Why? Because those with poor vision usually present to the ER with other serious injuries, such as from a motor vehicle accident, tire or battery explosion, or workplace accident, he says.

Take, for example, the recent case that Dr. Den Beste saw: "This patient had an eye injury from chiseling an exposed nail head—a fragment broke off and struck the center of his cornea."

Had the fragment penetrated? At first, it wasn't obvious. "His vision was 20/40, the anterior chamber was deep and quiet, and initially it seemed due to the location of the injury on the visual axis and the concomitant epithelial disruption," Dr. Den Beste says. "But he was referred to us because the injury was centrally located and he was a suspect for penetration."

An intraocular foreign body (IOFB) is serious and can have devastating complications if missed. "If the vision is reduced and the patient does have an IOFB, it's usually from secondary infection, inflammation (vitritis), vitreous hemorrhage or associated retinal issues, like detachment, retinal hemorrhage or choroidal rupture," Dr. Den Beste says. In addition, the FB can penetrate the crystalline lens and cause an acute cataract or subluxation.



Could this corneal scar be a clue to something deeper?

Due to such serious ramifications, "one is always obligated to see if there is a possibility that the foreign body penetrated the eye," he says. "Grinding and metal-on-metal histories should always alert the doctor of that possibility—whatever the vision."

In this patient's case, not only was his vision still good, but his anterior chamber was quiet, and intraocular pressure and Seidel test were both normal.

Still, "I suspected the foreign body had penetrated [into the eye] because the slit-lamp exam showed a trail that was full thickness," Dr. Den Beste says. Before dilation, a small injury to the anterior portion of the crystalline lens was visible. Upon dilation, a posterior subcapsular cataract was already forming.

Fundus evaluation is critical to tell if penetration has occurred, Dr. Den Beste says. In this case, "I found a large foreign body that stopped just short of the retina."

Red blood cells or pigment in the vitreous are also signs that foreign matter has entered the eye or has caused enough percussion to create a tear in the retina. "If the vitreous has too much blood or inflammation for visualization, then a B-scan can be of great assistance," he says. "If the B-scan is not helpful or available, then an orbital CT scan (no contrast is necessary) will quickly give you the answer. If a CT scan is not available, then an X-ray will also work and is inexpensive, although it won't help you localize the exact location of the foreign body."

If an IOFB is in the orbit itself, removal is not usually required. "The chance of infection is always possible and is usually treated prophylactically," Dr. Den Beste says.

In this case, the patient was sent for vitrectomy and the IOFB was removed. At the time of the pars plana surgery, the lens capsule ruptured and a total lensectomy was performed at the same time.

"This patient did well, but will need a secondary IOL or contact lens for final visual rehabilitation," Dr. Den Beste says. "He could have lost his eye or had permanently reduced acuity if his primary care optometrist had not been suspicious and referred him on for further evaluation." ■

MERIN A. GRAVES, OD

Dr. Graves completed a residency in ocular disease in Dallas, Texas, and practices primary care optometry at Wallace Optometry Associates in Bessemer, Ala.

Multifocal Contact Lens Fitting and Your Bottom Line

This new optometrist already recognizes the value in fitting multifocal lenses and uses them to boost her practice.

Before age 40, the primary reason patients stop wearing contact lenses has to do with issues relating to comfort. After age 40, the reasons are often the result of both comfort *and* vision issues.[1] Fortunately, we can accommodate this growing patient population with the latest generation of multifocal contact lenses.

I try to meet my patients' comfort and vision needs by considering their lifestyles and the things they do on a day-to-day basis. So, I think beyond the wall chart and near card, and routinely have patients examine their cell phones or the computer in the exam room, and I'll also ask them to step outside the office wearing trial lenses to test their real-world vision.

Time is Money

When it comes to setting fees for multifocal fittings, it's important to take into account the time and attention you dedicate to your presbyopic patients. More often than not, you're spending more time fitting a multifocal lens than a spherical lens. With that in mind, my practice places emphasis on this and prices these different services accordingly to ensure profitability.

For this reason, among others, fitting multifocal contact lenses is a great practice-builder. I usually fit my presbyopic patients in AIR OPTIX® AQUA Multifocal (lotrafilcon B) contact lenses because they are simple to fit and patients can be fit in as few as two visits. In fact, one study showed that on average, practitioners required 2.4 visits and less than four lenses per patient to successfully fit the AIR OPTIX® AQUA Multifocal contact lens.[2] The wide range of ADDs meets the needs of patients in almost any stage of presbyopia. And when the need to troubleshoot occurs, the fitting guidelines are readily available to assist. Due to the proven success this lens delivers, my presbyopic patients tend to be happy with their experience and more comfortable with the fees we set.

Tips for Multifocal Success

1. Present multifocal contact lenses to every presbyopic patient.

2. Fit your patients in a lens you know delivers results, like the AIR OPTIX® AQUA Multifocal lens.

3. Set fees accordingly. Fitting a multifocal lens is a specialty and requires more time than fitting a spherical lens.

4. Schedule a follow-up appointment with patients after a week to evaluate their lenses and dispense their new prescription. Remember, every patient deserves to have clear binocular vision.

Giving it back to them with a great multifocal lens will keep them happy and your practice growing.

Results You Can Count On

Patient feedback with regard to adaptability, comfort, night and computer vision has been extremely positive since we began fitting the AIR OPTIX® AQUA Multifocal contact lens in my practice. The greatest proof of my success with fitting multifocal lenses is that my satisfied patients have brought in their friends, family members, and co-workers.

Happy Patients, Happy Practice

The key to successful multifocal lens fitting is evaluating patients' visual needs and objectives, taking lifestyle into account and managing their expectations. Offer AIR OPTIX® AQUA Multifocal contact lenses to your presbyopes and see an increase in both satisfied patients and revenue.

REFERENCES: 1. Akerman DH. 40 is the New 20/20–Presbyopia Equals Opportunity. *Contact Lens Spectrum*. March 2010. Available at: www.clspectrum.com/printarticle.aspx?articleID=103978; Accessed May 2013. **2.** Rappon J, Bergenske P. AIR OPTIX® AQUA Multifocal contact lenses in practice. *Contact Lens Spectrum*. March 2010. Available at: www.clspectrum.com/articleviewer.aspx?articleid=103980; Accessed May 2013.

Blurred Lines

Because DSEK often induces posterior HOAs, many surgeons have turned to DMEK as an alternative. **Edited by Joseph P. Shovlin, OD**

Q What higher-order aberrations are expected following DSEK and what are the remedies, if any?

A First of all, it is important to note that Fuchs' dystrophy patients have a higher amount of anterior corneal higher-order aberrations (HOAs) when compared to normal corneas. It is speculated that anterior stromal haze may play a role, and should not be ignored as a source of decreased visual acuity after DSEK.[1]

"The DSEK procedure seems to have little effect on anterior corneal HOAs, but does induce posterior HOAs, and hence total-eye HOAs," says Richard Mangan, OD, Center Director at the Eye Center of Richmond, a multispecialty comanagement practice in Indiana and Ohio. A 2011 study found trefoil and quadrefoil were the predominant HOAs that emerged after DSEK.[2] There was a correlation between increased HOAs and graft thickness 24 months after DSEK, and thicker grafts were also associated with more graft folds.[2] The researchers also determined that there was little association between total HOAs and BCVA.

"What is more likely to contribute to decreased BCVA after DSEK is host-Descemet remnants at the donor-to-host interface, irregular graft thickness, interface reflection and/or donor contraction," Dr. Mangan says. "In the event of poor BCVA after DSEK, the optical quality of the transplanted cornea can be improved by careful removal of the DSEK graft, and secondary application of a DMEK graft. Most consider this a better option than proceeding with a full-thickness transplant or PKP."

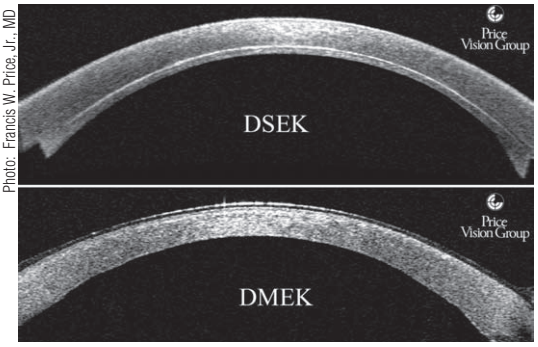


Photo: Francis W. Price, Jr., MD

Cross-sectional images of DSEK vs. DMEK corneal grafts taken with AS-OCT.

In DMEK, a patient's Descemet membrane and dysfunctional endothelium is replaced with the healthy endothelium and Descemet membrane from a donor cornea without the addition of any donor stromal tissue. "One reason posterior surface HOAs increase after DSEK is because the procedure includes posterior donor stromal tissue, resulting in variable thickness," says Francis W. Price, Jr., MD, founder and medical director of Price Vision Group in Indianapolis, Ind. "Since DMEK does not include any donor stroma, it is uniform and much thinner than a DSEK graft."

Another cause of posterior surface HOAs is that no attempt is made to match the curvature of the donor and recipient corneas, so folds or wrinkles—either micro or macro—can develop as the graft conforms to the back of the host cornea. "The visual impact is significantly greater with DSEK than DMEK because a DMEK graft is so much thinner," Dr. Price says. "Thickness variations and folds or wrinkles in the graft result in substantially increased posterior corneal HOAs with DSEK."

In contrast, the posterior corneal surface after DMEK more closely resembles that in age-matched control eyes, which is one reason DMEK provides superior visual results.[3,4] In fact, in a series of patients who had DSEK in one eye and DMEK in the other, 83% preferred the vision in the DMEK eye.[5] Many patients achieve excellent visual results with DSEK, but if they're not satisfied with their vision after DSEK and the anterior surface is fine, then repeating the surgery with DMEK is the best treatment.[6] ■

1. Patel SC, Baratz KH, Maguire LJ, et al. Anterior corneal aberrations after Descemet's stripping endothelial keratoplasty for Fuchs' endothelial dystrophy. Opthalmology. 2012 Aug;119(8):1522-9.
2. Seery LS, Nau CB, McLaren JW, et al. Graft thickness, graft folds, and aberrations after descemet stripping endothelial keratoplasty for fuchs dystrophy. Am J Ophthalmol. 2011 Dec;152(6):910-6.
3. Rudolph M, Laaser K, Bachmann BO, et al. Corneal higher-order aberrations after Descemet's membrane endothelial keratoplasty. Ophthalmology 2012 Mar;119(3):528-35.
4. Price MO, Giebel AW, Fairchild KM, Price FW Jr. Descemet's membrane endothelial keratoplasty: prospective multicenter study of visual and refractive outcomes and endothelial survival. Ophthalmology. 2009 Dec;116(12):2361-8.
5. Guerra FP, Anshu A, Price MO, Price FW. Endothelial keratoplasty: fellow eyes comparison of Descemet stripping automated endothelial keratoplasty and Descemet membrane endothelial keratoplasty. Cornea. 2011 Dec;30(12):1382-6.
6. Ham L, Dapena I, van der Wees J, Melles GR. Secondary DMEK for poor visual outcome after DSEK: donor posterior stroma may limit visual acuity in endothelial keratoplasty. Cornea. 2010 Nov;29(11):1278-83.

AMETEK®
ULTRA PRECISION TECHNOLOGIES

Intuitive, Inspired Pachymetry.

The Reichert® **iPac® Pachymeter** is the most advanced handheld pachymeter available. It features Bluetooth® wireless connectivity, one-button navigation, a rotating color LCD screen and a rechargeable lithium ion battery. Backed by an industry leading three-year warranty.

Call 1.888.849.8955, or visit **www.reichert.com/ipac**

Reichert® *is* pachymetry.

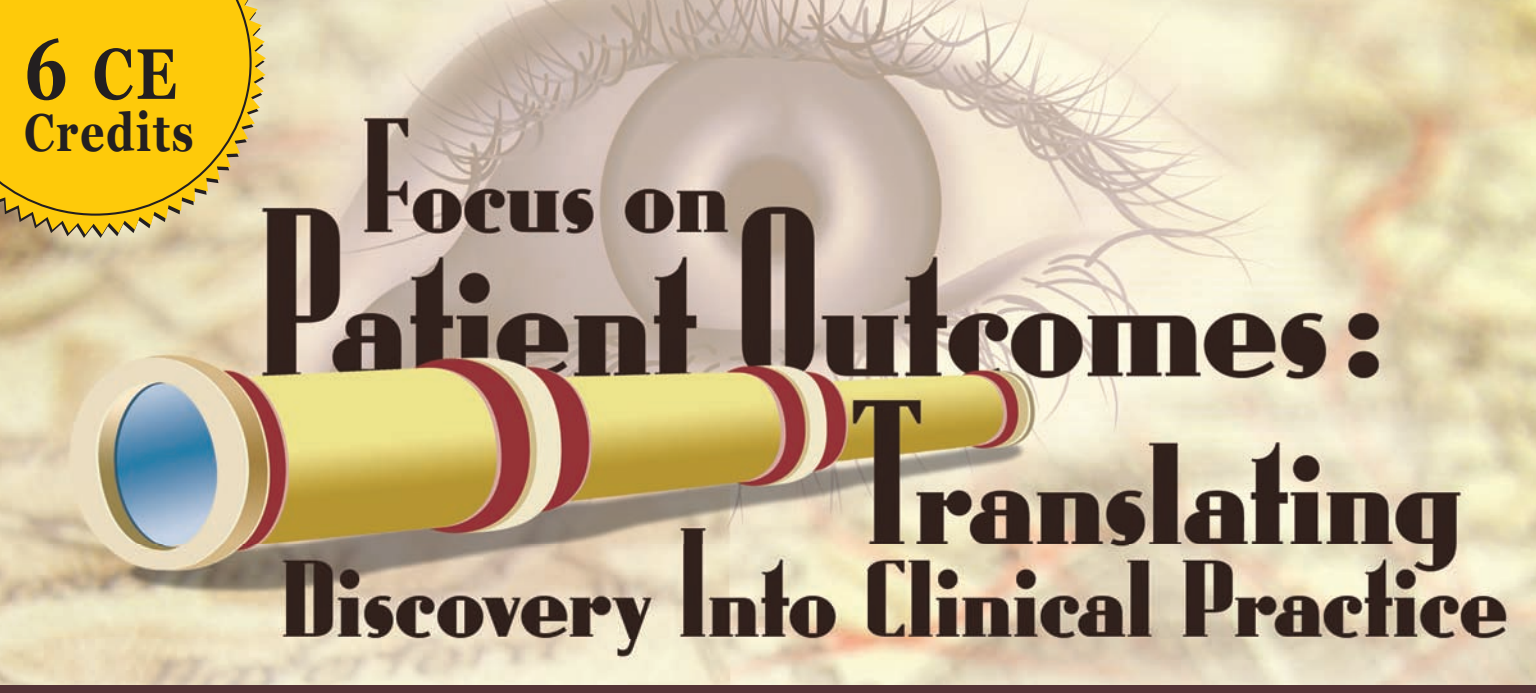
Reichert®
TECHNOLOGIES
Advancing Eye Care. Preserving Sight.™

Vision Expo Booth #MS 9043

@ReichertTech

6 CE Credits

Focus on Patient Outcomes: Translating Discovery Into Clinical Practice



6 complimentary hours of CE Credit

SATURDAY, SEPTEMBER 28, 2013

Renaissance Dallas Hotel
2222 North Stemmons Freeway Dallas, TX

SPEAKERS

Alan Kabat, OD
Art Epstein, OD
Walter O. Whitley, OD
John Rumpakis, OD, MBA
Leo P. Semes, OD

TOPICS

Allergy
Co-Management of Cataract Surgery
Dry Eye
Medical Coding & Compliance
Anti-Infectives
Contact Lenses & Lens Care
Glaucoma

SCHEDULE

7:30am-8:00am	Breakfast
8:00am-10:00am	CE Education
10:00am-10:15am	Break
10:15am-12:15pm	CE education
12:15pm-12:30pm	Break
12:30pm-2:30pm	Working Lunch

Agenda Subject to Change

5 WAYS TO REGISTER

Online: www.revoptom.com/OutcomesSept28
Email Lois DiDomenico:ReviewMeeting@Jobson.com
Call: 866-730-9257
Fax: 610.492.1039
Mail: Review Group Meetings c/o Jobson
11 Campus Blvd, Ste. 100
Newtown Square, PA 19073

Sponsored By REVIEW OF OPTOMETRY

cope

Supported by an independent medical educational grant from Alcon

It Takes a Village

Coordinating with other health care professionals in the care of diabetic patients allows optometrists to take proactive measures against severe vision loss.

By Carlo J. Pelino, OD, and Joseph J. Pizzimenti, OD

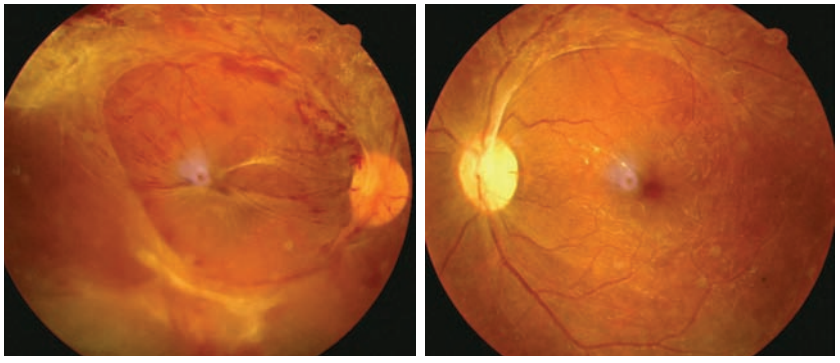
Recent research has shed more light on the intensity of the diabetes epidemic in the US—indicating a 45% increase in the prevalence of the disease among American adults over the past two decades.[1] Like many other specialties in health care, eye care has been ramping up its efforts in diabetes prevention and management. We also have to take a look beyond the eyes of our diabetic patients.

Optimal ocular health and wellness requires comprehensive evaluation at appropriate intervals and interprofessional cooperation among providers. Proper control and management of systemic disorders and metabolic abnormalities associated with diabetes influences the onset, progression and visual outcome of diabetic eye disease.

More Than Just Retinopathy

When we're talking about diabetic eye disease, retinopathy and macular edema often dominate the conversation. And while these conditions certainly are the most frequent ocular manifestations of diabetes, they're far from the only complications we have to monitor.

Individuals living with diabetes are 40% more likely to develop glaucoma and 60% more likely to develop cataracts than those without.[2] More specifically, cataracts manifest earlier and progress faster in patients with diabetes, and the risk of glaucoma increases accordingly with duration of disease.[3,4] This means double trouble for seniors age 65 and older—a demographic already prone to cataracts and glaucoma, but also identified as the age group with the greatest rise in diabetes prevalence over the last 20 years.[1]



This patient exhibited proliferative diabetic retinopathy in both eyes. He had a hemoglobin A1c of 9%, body mass index of 45, obstructive sleep apnea, hypertension, vitamin D deficiency and a history of smoking.

Other ocular anomalies associated with diabetes include decreased corneal sensitivity, surface dryness, iris neovascularization, pupillary abnormalities secondary to autonomic neuropathy, fluctuating refractive error associated with sorbitol in the lens, a "snowflake" cataract in patients with type 1 diabetes, optic nerve abnormalities and other cranial neuropathies.[5,6]

An Interprofessional Approach

Scores of studies have supported the theory that optimal control over systemic and metabolic factors can effectively prevent the development and progression of diabetic retinopathy (DR) and diabetic macular edema (DME). However, many patients fail to achieve or maintain optimal levels of metabolic control.

As primary care optometrists, we can help by being aware of the associated factors that can modify (in either a good or bad way) retinopathy that may become sight threatening. If our patients appear to be at an elevated risk for any associated complications of diabetes, it's our responsibility to raise a red flag and recommend that they seek the proper medical follow-up.

Factors That Modify Diabetic Eye Disease

Here is a breakdown of common associated systemic and metabolic comorbidities and factors that modify diabetic eye disease:[7-12]

• ***Hypertension.*** Systemic hypertension is an established risk factor, both for development and

Review Meetings 2013

SAVE THESE DATES FOR 2013

Join us for 14-15 CE* credits!

Educational Chair: Paul Karpecki, OD

New Technology & Treatments IN VISION CARE WEST COAST

SEPTEMBER 20-22, 2013

Marriott Del Mar, San Diego

NOVEMBER 22-24, 2013

Westin Alexandria, Virginia

For more information: www.revoptom.com/conferences

Please contact Lois DiDomenico with questions at ReviewMeetings@Jobson.com or 1-866-658-1772.

jmi REVIEW® OF OPTOMETRY

cope®

*Approval Pending

progression of DR. Diabetic patients with concomitant hypertension are up to three times more likely to develop DME. Patients' blood pressure should remain below 125mm Hg/80mm Hg.

• ***Kidney disease.*** Changes in renal function may portend retinal changes. Normal blood urea nitrogen (BUN) to creatinine ratio should hover between 10:1 and 20:1. A person with diabetes and proteinuria (a.k.a., albuminuria) with or without high blood pressure may need a class of drugs called angiotensin-converting enzyme inhibitors, or a similar class called angiotensin receptor blockers. These drugs have been found to protect kidney function and possibly retinal tissue.

• ***Dyslipidemia***. According to the American Diabetes Association, the target for LDL cholesterol level for men and women with diabetes is <100mg/dL. For HDL, the target is >40mg/dL for men and >50mg/dL for women.

• ***Anemia.*** Anemia often accompanies diabetic kidney disease. Hemoglobin levels should measure 12g/dL or higher.

• ***Obstructive sleep apnea.*** Obstructive sleep apnea may aggravate diabetic retinopathy and diabetic macular edema, secondary to nocturnal hypertension and hypoxemia. Obtain a pulmonology consult for sleep studies and treatment, if necessary.

• ***Obesity.*** Obesity is a risk factor for both sleep apnea and type 2 diabetes. Discuss the importance of nutrition and physical activity with patients.

• ***Tobacco use.*** Smoking increases activated circulating leukocytes and platelet activation, and the nicotine in tobacco products causes severe retinal vasoconstriction. Provide information about local or statewide tobacco cessation programs to help patients kick the habit.

• ***Glycemic control.*** Help patients reach a goal of 6.5% hemoglobin A1c through proper nutrition, exercise, insulin use or oral medications.

• ***Vasculitis.*** Rule out gum disease, leg ulcers, gastritis and urinary tract infections.

• ***Neuropathy.*** Like retinopathy and nephropathy, neuropathy is a chronic microvascular complication. To prevent diabetic neuropathy, we must recognize the risk factors and the symptoms (numbness, tingling) and signs (reduced reflexes, poor nerve conduction), and understand the importance of tight glycemic control.

• ***Vitamin D deficiency.*** Boost patients' vitamin D levels with protected exposure to sunlight and supplements, particularly in darkly pigmented individuals. Vitamin D insufficiency is more prevalent among blacks than individuals of other races. Further, most young, healthy blacks in North America do not achieve optimal 25-hydroxyvitamin D concentrations at any time of year. This is because increased skin pigmentation reduces vitamin D production in the skin.

• ***Insufficient sleep.*** Lack of sleep can lead to increased blood insulin, insulin resistance, cortisol release and inflammation. Encourage good sleep hygiene and recommend at least seven hours of uninterrupted sleep per night.

• ***Chronic stress.*** Chronically elevated stress levels can lead to a change in gene expression and cellular aging as well as an increase in cortisol, insulin and inflammation. Cortisol, in turn, increases cytokine production and oxidative stress. Suggest stress reduction and a balanced lifestyle.

It is crucial that health care providers interact with one another in managing our patients to ensure that they achieve the best quality of life and health. As primary health care providers, we must go beyond the retina in caring for patients with diabetes. ■

For a list of references, visit www.revoptom.com.

Novel Ocular Biomarkers for Diabetes

Multiple studies have indicated that serum carotenoids, including the macular pigments lutein and zeaxanthin, are inversely associated with type 2 diabetes and impaired glucose metabolism.[13,14] More than a decade ago, researchers in the UK found that subjects with type 2 diabetes had reduced macular pigment optical density (MPOD) compared with non-diabetic controls.[13]

Additional findings, which showed a relationship between reduced MPOD and increased severity of diabetic maculopathy, may implicate oxidative stress as a causative factor.[13] A more recent study showed that type 2 diabetes patients—with or without retinopathy—had reduced MPOD compared scores to those of non-diabetic patients. In addition, researchers observed a significant inverse correlation between MPOD and HbA1c levels.[14]

A series of studies illustrated how measuring crystalline lens autofluorescence may help identify the presence of elevated advanced glycosolated endproducts (AGEs)—a biomarker highly correlated to glycemic control—prior to the presentation of early-stage complications. Subjects with poor glycemic control had significantly higher levels of AGE in their lens compared to age-matched healthy controls.[13,15,16] This research has gained increased relevance with the commercial availability of the first FDA-approved noninvasive lens fluorescence biomicroscope (ClearPath DS-120, Freedom Meditech), which measures autofluorescence via a six-second scan of the crystalline lens.

Save the Date!

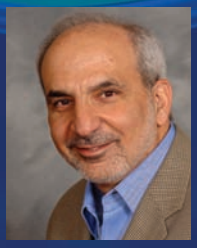
12 CE Credits
(COPE approval pending)

OPTOMETRIC SYMPOSIUM

Mark your calendars for the

4th Annual

West Coast Optometric Glaucoma Symposium



Course Director:
Murray Fingeret, OD

Speakers:
David Friedman, OD
Ben Gaddie, OD
Richard Madonna,OD
Leo Semes ,OD
Tony Realini , MD
Robert Weinreb, MD

December 13-14, 2013
Fairmont Newport Beach
Newport Beach, California

Limited time reservations for $149 single/double
Call (949) 476-2001 and mention this program

Identify yourself as a participant of the West Coast Optometric Glaucoma Symposium (WCOGS)

12 COPE Credits* for only $185!

I invite you to join us for this comprehensive glaucoma symposium that will take place at the Fairmont Newport Beach in Newport Beach, California. We will have a group of renowned doctors who specialize in glaucoma. The program will consist of short talks and Q&A panels. Interaction with the faculty is a large part of the program. The agenda will cover the steps taken in establishing the diagnosis of glaucoma, information on new instrumentation and changing paradigms with regard to glaucoma therapy. The program runs Friday from 9:00 am – 6:00 pm, and Saturday from 8:00 am – 1:30 pm.

I look forward to seeing you in Newport Beach!
Murray Fingeret, OD

5 WAYS TO REGISTER

ONLINE: www.revoptom.com/WCOGS2013

EMAIL: ReviewMeetings@Jobson.com

CALL: Lois DiDomenico 877-451-6514

MAIL: Review Group Meetings c/o Jobson
11 Campus Blvd., Ste. 100
Newtown Square, PA 19073

FAX: (610) 492-1039

For questions, please email Denette Holmes at ReviewLogistics@jobson.com or call 866-627-0714 .

Partially supported by an educational grant from

Sponsored by

REVIEW® OF OPTOMETRY

cope®

**COPE approval pending*

Alcon®

A Chilling Presentation

This HIV+ patient presented with markedly reduced vision in her right eye. What does the fundus examination reveal? **By Mark T. Dunbar, OD**

A 52-year-old Hispanic female presented with poor vision in her right eye that had persisted for the past month. She reported no visual problems with her left eye. She exhibited no signs of pain or discomfort.

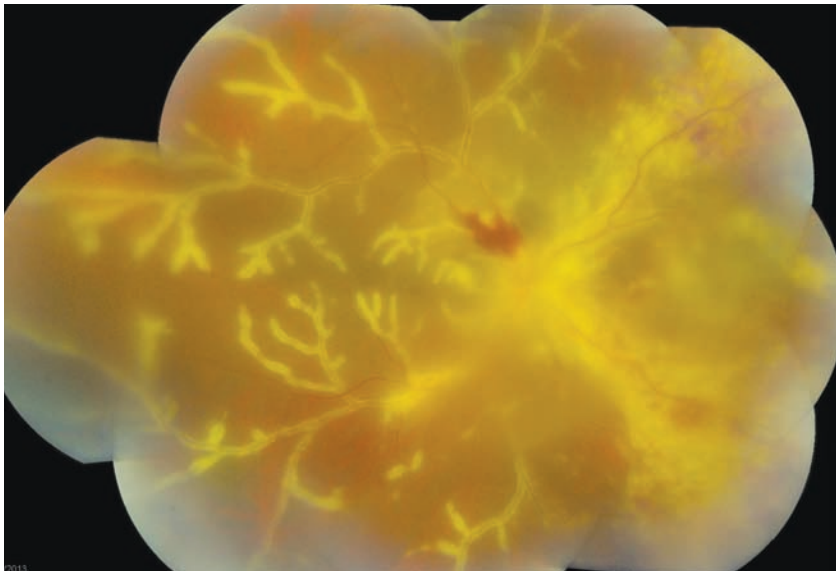
Her systemic history was significant for HIV, which was diagnosed approximately seven months earlier. The patient reported taking multiple HIV medications, but did not know their names. She was unaware of her CD4 count or viral load. Additionally, the patient has type I herpes simplex virus (HSV), for which she takes acyclovir.

At her last eye examination two years ago, her best-corrected visual acuity measured 20/20 OU.

At this examination, her uncorrected visual acuity measured 4/200 OD and 20/20 OS. Confrontation fields showed generalized constriction 360° OD and full to careful finger counting OS. The pupils were equally round and reactive, with a strong afferent defect OD.

The anterior segment of the right eye was significant for fine keratic precipitates on the endothelium and trace to 1+ cells in the anterior chamber. The iris and lens were unremarkable. There were 2+ cells in the vitreous. The anterior segment of the left eye was completely unremarkable. Intraocular pressure measured 11mm Hg OU.

Dilated fundus examination of the right eye showed a hazy view of the retina (*figure 1*). We also obtained a spectral-domain optical coherence tomography (SD-OCT) scan of the patient's right eye (*figure 2*).



1. The posterior pole and peripheral montage of our patient's right eye. Note the dramatic presentation throughout the retina.

The fundus examination of the left eye was completely normal.

Take the Retina Quiz

1. How do you account for the anterior segment changes OD?
   a. Spillover.
   b. Active anterior uveitis from an infectious process.
   c. Active anterior uveitis from a noninfectious process.
   c. Resolved anterior uveitis.

2. How would you classify the fundus changes seen in her right eye?
   a. Retinal vascular process.
   b. Infectious process.
   c. Infiltrative process.
   d. Inflammatory process.

3. Which term commonly is used to describe the presentation observed in her right eye?
   a. Periphlebitis.
   b. Candle wax drippings.
   c. Retinal vasculitis.
   d. Frosted branch angiitis (FBA).

4. What is the correct diagnosis?
   a. Cytomegalovirus (CMV) retinitis.
   b. Acute retinal necrosis.
   c. Toxoplasmosis.
   d. Syphilis.

5. What is the most appropriate treatment?
   a. Observation.

EDUCATION
EXHIBITS
EVENTS

SAVE THE DATE

SECO2014

Atlanta, GA | March 12-16

THE FULL SPECTRUM OF EYE CARE

LEARN MORE ABOUT OPTOMETRY'S MOST IMPORTANT AND COMPELLING EVENT OF THE YEAR AT **SECOINTERNATIONAL.COM**

b. Referral to infectious disease specialist.
c. Antiviral therapy.
d. Antibiotic therapy.

For answers, turn to page 122.

Discussion

The dramatic changes seen in our patient's right fundus represent FBA due to CMV retinitis. FBA was first reported in 1976 in a healthy, six-year-old Japanese boy who presented with panuveitis and severe retinal vasculitis. The florid, translucent perivascular exudate inspired the descriptive term "frosted branch angiitis."[1,2]

More than 75% of FBA cases have been documented in Japan, with fewer than 20 confirmed diagnoses in the US.[1,2] At one time, FBA was thought to predominantly affect fit, healthy individuals.[1] Today, however, the condition is known to occur as a secondary outcome of severe infectious or inflammatory disease—CMV is one of the most common.[1-3]

In our patient, a fulminant retinal vasculitis and periphlebitis could be seen 360° throughout the fundus, which lent a frosted appearance to the perivascular exudate. Additionally, there was a full-thickness retinitis located adjacent to the optic nerve, which extended nasally along the superior and inferior arcades. This represents active CMV retinitis. Further, we detected generalized disc edema and retinal hemorrhages scattered throughout the fundus.

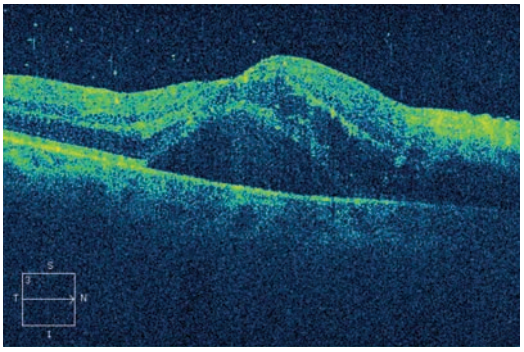
The right macula appeared thickened on clinical examination. We confirmed this finding on SD-OCT at the location of the serous detachment. The CMV retinitis was responsible for the vitreous cells and the spillover into the anterior chamber, which gave us the somewhat hazy view into the retina.

The pathogenesis of FBA is not completely understood, but likely depends on the underlying inflammatory disease. Some researchers have speculated that FBA is caused by a hypersensitivity to various infective agents.[1,2] More specifically, this hypothesis suggests that the CMV elicits a periphlebitis via a type 3 hypersensitivity reaction to the pathogen's particles.[1] The reaction likely occurs within the retinal vascular endothelial cells, causing disruption of the microtubule support and endothelial function impairment.[2]

In the literature, most cases of FBA have presented bilaterally and were more common in females.[1,2] Although our patient is female, the condition presented unilaterally. This is not much of a surprise, however, considering that the CMV was present only in that eye.

CMV retinitis is the most common ocular complication seen in patients who are diagnosed with HIV. The condition typically develops in patients whose CD4 counts are below 50, or even much lower. CMV was prevalent during the early years of the AIDS epidemic, developing in up to 40% of AIDS patients.[3] Fortunately, since the advent of HAART (highly active antiretroviral therapy) more than a decade ago, researchers have documented a 55% to 95% decline in the incidence of CMV retinitis cases.[3]

CMV retinitis may be present anywhere in the retina. Posterior pole lesions exhibit a characteristic white, hemorrhagic appearance with retinal necrosis and edema, while the peripheral lesions are more indolent and nonhemorrhagic. Our patient exhibited a combination of both presentations.



2. A SD-OCT scan through our patient's right macula. What does this finding represent?

With the use of several effective antiviral medications—including ganciclovir, foscarnet, valganciclovir and cidofovir—the treatment for CMV retinitis has become fairly standard. Anti-CMV treatment should be individualized based on the presentation's location and severity, as well as the patient's current level of immune suppression, concomitant medication regimen and ability to comply with treatment. Therapy is induced at high doses for two to three weeks or until the retinitis stabilizes, followed by a maintenance dose.

Even though our patient did not know her CD4 count (or her viral load), we assumed that it was very low. We referred her for an immediate intravitreal injection of ganciclovir, and sent her to a local hospital to be admitted for further evaluation and treatment. ■

1. Walker S, Iguchi A, Jones NP. Frosted branch angiitis: a review. Eye (Lond). 2004 May;18(5):527-33.
2. Silva RA, Albini TA, Flynn HW. Retinal Physician. It still happens today: bilateral frosted branch angiitis in cytomegalovirus retinitis. Available at: www.retinalphysician.com/articleviewer.aspx?articleID=104854. Accessed August 15, 2013.
3. Jabs DA, Van Natta ML, Kempen JH, et al. Characteristics of patients with cytomegalovirus retinitis in the era of highly active antiretroviral therapy. Am J Ophthalmol. 2002 Jan;133(1):48-61.

Rubbed the Wrong Way

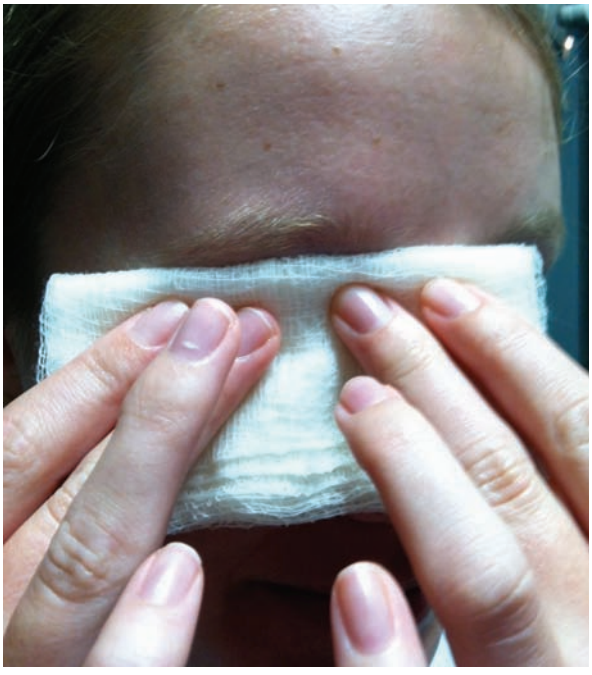
In MGD patients, intense lid massage and hot compress therapy can cause significant corneal warping. **By Alan G. Kabat, OD, and Joseph W. Sowka, OD**

Dr. David Sackett, often referred to as "the father of evidence-based medicine," is quoted as telling a class of medical students, "Half of what you'll learn in medical school will be shown to be either dead wrong or out of date within five years of your graduation; the trouble is that nobody can tell you which half."

Optometry certainly has seen its share of discarded dogmatic practices. The water provocative test for glaucoma and the use of pressure patching for corneal abrasions were once taught as essential components of practice. By 2013, however, we've realized that these procedures are outdated, overrated or just plain wrong.

Sometimes it can be difficult to accept that something you've been doing for many years is incorrect, inappropriate or even potentially harmful. But, as optometry becomes more sophisticated and research brings us new clinical evidence, we are bound to see a multitude of changes in many things once considered standard of care.

It was such a scenario after attending a lecture about meibomian gland dysfunction (MGD) and dry eye by Donald R. Korb, OD, at the 2012 American Academy of Optometry meeting in Phoenix. Dr. Korb alluded that the use of warm compresses with digital massage—a seemingly innocuous practice that most of us recommend for patients with blepharitis and chalazia—actually might be detrimental to corneal health. It was just a brief mention, but it was noteworthy. And it seems that, over the last few years, several researchers have evaluated the potential for corneal warping when patients used combined heat and massage for eyelid conditions.



Today, conventional therapy for most patients with MGD includes warm compresses and lid massage.

Hot Under Pressure

There is little question that warm compresses can have a positive impact on conditions like MGD and evaporative dry eye. In 2003, a paper authored by Mary C. Olson, BA, Jack V. Greiner, OD, DO, PhD, and Dr. Korb showed significant improvement in tear film lipid layer thickness following treatment with warm compresses in a series of 20 patients with MGD.[1]

Subjects were instructed to apply moist cotton napkins heated to 40°C to their eyelids using gentle pressure for a defined period of time. Their results showed an increase in lipid layer thickness of more than 80% after just five minutes of treatment; a subsequent 20% increase in lipid thickness was documented after 15 additional minutes of therapy.[1]

Nevertheless, we now know that vigorous eye rubbing has been associated with corneal deformities—including keratoconus in the most severe instances. In a 2009 publication, professor Charles McMonnies, PhD, detailed the mechanisms of rubbing-related corneal trauma, citing elevated corneal temperature as one of the factors that can promote keratoconic deformation.[2]

Such temperature increases can occur simply by closing the eyelids, but the act of pressing and rubbing on the lids and globes can exacerbate the process.

Corneal Deformation

In a small study conducted at the School of Optometry at the Hong Kong Polytechnic University, researchers examined the corneal reshaping effect of using hard-boiled eggs as warm compresses.[3] While it may sound unorthodox, many individuals around the world employ cooked eggs (and other food items) as heat-delivery systems for medical purposes, and research has actually confirmed that such foods retain and deliver heat better than wet washcloths.[4]

Three arms were analyzed in this study: group 1 used a hot, cooked egg wrapped in wet cloth held gently against the closed eyelid; group 2 similarly used a hot, cooked egg wrapped in cloth, but was told to simply hold it near the eyelid without touching it; and group 3 used a cold egg wrapped in wet cloth held gently against the eyelid. All groups employed the therapy for a five-minute period. Researchers then compared corneal topography for each subject before and immediately after treatment.

Patients in groups 1 and 3 exhibited statistically significant differences in two corneal parameters—the surface asymmetry index and the surface regularity index. Group 1 subjects actually showed the greatest difference in corneal measurement, while those in group 2 demonstrated the least difference.

The researchers concluded that the pressure on the eyelids, especially when combined with heat, was the driving force behind the induced corneal distortion.[3]

In late 2012, Drs. McMonnies, Korb and Caroline Blackie, OD, PhD, described a 24-year-old dry eye patient with extreme corneal warping that they attributed to a regimen of warm compress therapy and digital lid massage for MGD.[5] Corneal maps showed notable, bilateral changes in astigmatism, approaching what could only be described as pseudokeratoconus in one eye.

Their review of the literature yielded the following conclusions: "When combined with warm compresses or other methods of heat delivery to the eye, the elevation of corneal temperature appears to explain how meibomian gland dysfunction treatment involving warm compresses and massage could

induce rubbing-related deformation. Patients whose management involves iatrogenic ocular massage appear to require screening for risk of corneal deformation. Risk may be increased for patients with a concurrent habit of rubbing their eyes abnormally in response to allergic itch, for example."[5]

A July 2013 follow-up paper by the same authors evaluated the efficacy and safety of heat transfer to the cornea via warm compress therapy.[6] The researchers found that temperatures approaching 40°C could be achieved with warm compresses and light pressure after just eight minutes of continuous application (the normal corneal temperature is approximately 36°C). Vigorous rubbing may increase temperatures considerably and hasten the potential for corneal deformation—particularly in at-risk patients, such as those with keratoconus, axial myopia and glaucoma.[6]

So, how does this information impact our day-to-day practice? What should we tell patients regarding warm compress therapy for MGD, chalazia and other forms of eyelid inflammation? Based on the literature, it appears that the use of heat with gentle pressure is still beneficial for many conditions.

However, vigorous lid massage should be avoided in some patients—especially when combined with heat—because of the potential for corneal deformity and subsequent visual dysfunction. Instead, alternative therapies that do not induce significant corneal heating and mechanical pressure, such as the LipiFlow Thermal Pulsation System (TearScience, Inc.), or therapeutic intervention with oral doxycycline and/or topical azithromycin may be more effective approaches for chronic lid disease management. ■

Drs. Kabat and Sowka have no direct financial interest in any of the products mentioned.

1. Olson MC, Korb DR, Greiner JV. Increase in tear film lipid layer thickness following treatment with warm compresses in patients with meibomian gland dysfunction. Eye Contact Lens. 2003 Apr;29(2):96-9.
2. McMonnies CW. Mechanisms of rubbing-related corneal trauma in keratoconus. Cornea. 2009 Jul;28(6):607-15.
3. Lam AK, Lam CH. Effect of warm compress therapy from hard-boiled eggs on corneal shape. Cornea. 2007 Feb;26(2):163-7.
4. Freedman HL, Preston KL. Heat retention in varieties of warm compresses: a comparison between warm soaks, hard-boiled eggs and the re-heater. Ophthalmic Surg. 1989 Dec;20(12):846-8.
5. McMonnies CW, Korb DR, Blackie CA. The role of heat in rubbing and massage-related corneal deformation. Cont Lens Anterior Eye. 2012 Aug;35(4):148-54.
6. Blackie CA, McMonnies CW, Korb DR. Warm compresses and the risks of elevated corneal temperature with massage. Cornea. 2013 Jul;32(7):e146-9.

Up To 15
CE Credits
(COPE approval pending)

2014 NEW TECHNOLOGIES AND TREATMENTS IN VISION CARE

...*REVIEW* MEETINGS OF CLINICAL EXCELLENCE

SAVE THESE DATES:

ARUBA	January 16-19
SAN DIEGO, CA	May 2-4
ORLANDO, FL	June 19-22
MINNEAPOLIS, MN	July 17-20
TYSONS CORNER, VA (Washington DC area)	September 12-14

REVIEW® OF OPTOMETRY

cope®
*Approval pending

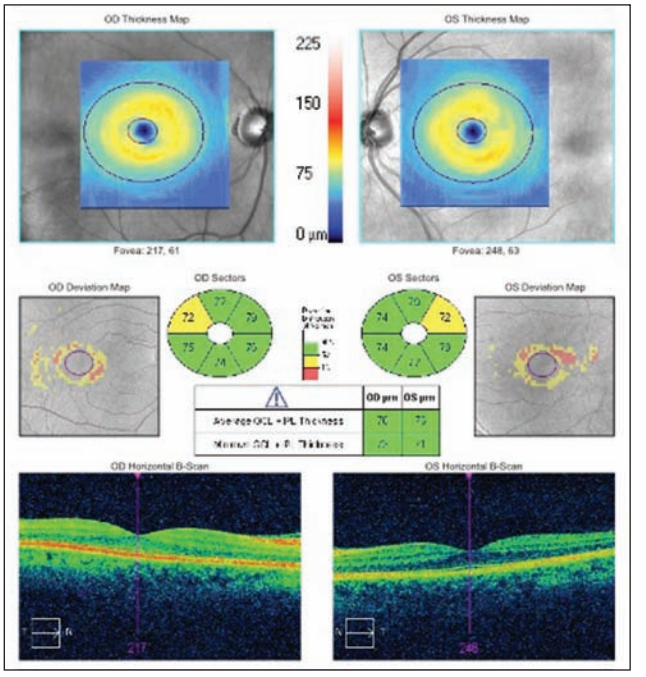
MS and the Retina

SD-OCT not only can be used to diagnose multiple sclerosis, but also document its progression. **By Diana L. Shechtman, OD, and Paul M. Karpecki, OD**

A 43-year-old white female presented for a comprehensive eye exam. Her medical history was significant for multiple sclerosis (MS), which was diagnosed five years earlier. Her last MRI was performed more than two years ago.

The patient's pupils and extraocular motilities were normal. Additionally, the dilated fundus examination was unremarkable. Given her history of MS, we obtained a spectral-domain optical coherence tomography (SD-OCT) scan. The ganglion cell complex analysis revealed mild thinning OU.

Could the changes observed on her ganglion cell analysis be used to determine the status of her MS?



The SD-OCT scan of our 43-year-old patient showed mild ganglion cell/inner plexiform (GCIP) thinning OU.

A Connection with the Eye?

MS is an autoimmune disease characterized by nerve demyelination within the central nervous system. Because this process causes reduced axon transmission, patients with MS often experience permanent disabilities.

Traditionally, magnetic resonance imaging has been used to measure the severity of MS. However, it's often challenging to correlate the clinical signs and symptoms with MRI findings.

Because the retinal nerve fibers are not protected by myelin, clinicians are able to visualize isolated axons via optical coherence tomography. The ability to measure retinal nerve fiber layer integrity effectively provides an indirect method of anterior visual pathway assessment in MS patients.[1]

Several studies have indicated that patients with MS often exhibit retinal nerve fiber layer thinning when compared to healthy, age-matched patients.[1-4] It is important to note that such findings have been documented in MS patients who present either with or without a history of optic neuritis.[5] Additionally, subclinical disease manifestation has been linked to decreased macular thickness.[6]

New Diagnostic Approaches

One study published in January 2013 showed that ganglion cell complex quantification could help determine the extent of MS progression.[7] The researchers concluded that acceleration of ganglion cell/inner plexiform (GCIP) thinning was indicative of disease activity and severity.[7]

All four subtypes of MS were included in this study (isolated syndrome, relapse, and both primary and secondary progressive). Patients with an established history of optic neuritis—as well as those who manifested the condition during the study—were excluded.

The study population included 164 MS patients and 59 control subjects. All participants underwent a battery of tests over a 21-month duration, including spectral-domain OCT every six months and an annual contrast-enhanced brain MRI.

The researchers determined that subjects who experienced an MS relapse during the study exhibited 42% faster GCIP thinning than those who did not experience a relapse.[7] Additionally, MS subjects who manifested new or enhanced lesion growth on MRI experienced 36% to 54% faster GCIP thinning compared to those who did not develop such changes.

Significant inflammation documented early in the disease process secondary to GCIP thinning may be linked to MS-related disability. For example, patients who were diagnosed with MS within the last five years showed a higher annual rate of GCIP thinning than those who were diagnosed with MS more than five years ago.[7] This finding suggests an increased likelihood for the patient to exhibit a greater degree of inflammation early in the disease process. Also of interest, the presence of cumulative factors (e.g., the development of new T2 lesions) might increase the rate of GCIP thinning.[7]

Optical coherence tomography provides clinicians a novel way of measuring axon loss in patients with MS. Retinal nerve fiber layer analysis, macular thickness assessment and ganglion cell complex measurements are instrumental in the diagnosis and evaluation of the condition. In particular, alterations in ganglion cell density may reflect micro-inflammatory processes in the absence of clinically evident of optic neuritis. Hopefully, in the near future, OCT will enable clinicians to assess the efficacy of prospective neuroprotective agents. ■

1. Barkhof F, Calabresi PA, Miller DH, et al. Imaging outcomes for neuroprotection and repair in multiple sclerosis trials. Nat Rev Neurol. 2009 May;5(5):256-66.
2. Frohman EM. Modeling axonal degeneration within the anterior visual system: implications for demonstrating neuroprotection in multiple sclerosis. Arch Neurol. 2008 Jan;65(1):26-35.
3. Sergott RC, Frohman E, Glanzman R, et al. The role of optical coherence tomography in multiple sclerosis: expert panel consensus. J Neurol Sci. 2007 Dec 15;263(1-2):3-14.
4. Trip SA, Schlottmann PG, Jones SJ, et al. Retinal nerve fiber layer axonal loss and visual dysfunction in optic neuritis. Ann Neurol. 2005 Sep;58(3):383-91.
5. Oberwahrenbrock T, Schippling S. Retinal damage in multiple sclerosis disease subtypes measured by high-resolution optical coherence tomography. Mult Scler Int. 2012;2012:530305.
6. Burkholder BM, Osborne B. Macular volume determined by optical coherence tomography as a measure of neuronal loss in multiple sclerosis. Arch Neurol. 2009 Nov;66:1366-72.
7. Ratchford JN, Saidha S, Sotirchos ES, et al. Active MS is associated with accelerated retinal ganglion cell/inner plexiform layer thinning. Neurology. 2013 Jan 1;80(1):47-54.

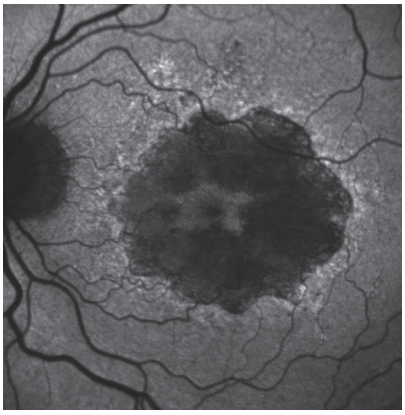
(continued from page 91)

"Given suspicions, further testing is indicated to confirm or rule out glaucomatous damage," says Dr. Semes. "Comprehensive clinical data collection, in addition to a complete history, can include stereo photographic documentation of the optic nerve and RNFL, visual field testing, pachymetry, serial tonometry and additional ancillary testing."

Eye on AMD and Nutraceuticals

In light of the new AREDS2 study results and the growing interest in ocular vitamins among patients and optometrists, VEW's first-ever nutraceutical track will feature courses covering macular degeneration and nutritional supplements that impact both the front and back of the eye.

"While we think that the AREDS studies 'prove' that nutrition can make a difference in eyes that are already diseased, we also have the research to show some preventive aspects of many other nutritional supplements," says Jeffrey Anshel, OD, who will present a course titled "The Power of Nutrition in Ocular and Systemic Health."



3. Fundus autofluorescence image of atrophic AMD.

Dr. Anshel will discuss the risks and benefits of supplements to your patients, plus information about dosing and product potency.

During course "The Anterior Segment and Nutrition," Stuart Richer, OD, PhD, will teach attendees how to use natural substances to reduce inflammatory cytokines and activation of NFkB, particularly the role of essential fats and an individual's 25 (OH) vitamin D liver reserve status in fighting disease.

Another luminary on the lecture circuit, Paul Karpecki, OD, will present "Anterior Segment Considerations in Nutraceutical Therapy." Dr. Karpecki will provide an understanding of the etiology, predisposing factors, diagnosis and treatment options for various ocular surface diseases where nutraceuticals have been shown effective, including dry eye and meibomian gland dysfunction. Dr. Karpecki will discuss signs, symptoms, diagnostic testing and therapeutic management with an emphasis on nutrition.

Nutraceuticals' role in the posterior segment will also be reviewed, with courses such as "Here is Why You Care About Posterior Segment Nutritional Supplements," by Jeff Gerson, OD, who will explain why nutritional support is important in posterior segment disease, and how to set up plans of action. Dr. Gerson will also highlight the latest in clinical trials.

Also, as part of the Macular Degeneration and Nutritional Supplements track, optometrist Jay Haynie will present "Imaging and AMD," wherein he will review current imaging options available, most notably the value of SD-OCT in diagnosis.

"AMD has become epidemic, and with the advances in technology, we are now able to diagnose wet AMD earlier with SD-OCT technology," Dr. Haynie says. "In all of the studies looking at response to intravitreal therapy, the group that continues to do the best is those who are diagnosed earliest and the size of the choroidal neovascular membrane the smallest." ■

VEW: Beyond the Clinical

In addition to its clinical CE emphasis, VEW offers innovative courses aimed at boosting your practice's bottom line and ensuring your patients' satisfaction. Notable additions:

Frame Buyer's Certification Program: Your optical staff can take advantage of 18 hours of education that will help them streamline the process of managing, monitoring, positioning and promoting your frame inventory, including classes on eyewear trends and selection techniques, creating and using tools to manage inventory, and reframing Rx limitations. "Dispensary is a very important part of our practice, so we want to make sure the people who we have entrusted in managing it have excellent education," Dr. Smick says.

Chief Experience Officer (CXO) Certification Program: Customer service is one of the strongest influencers of purchasing decisions. In this four-hour course, learn how a CXO in your practice can drive and implement exceptional customer service by differentiating your business from the Internet and increasing patient satisfaction, loyalty and profits. Several major corporations, including Procter & Gamble, have created CXO positions, Dr. Smick says. "Our practices are also business units. We need to make sure we invest in our patients and that they have a positive experience."

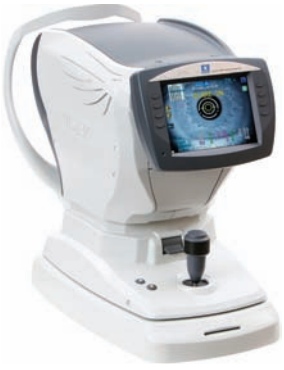
Product Review

Autorefractor

Nidek and Marco ARK-1s

With the newly announced ARK-1s autorefractor/autokeratometer with glare testing by Nidek and Marco, practitioners will be able to detect refractive problems in patients with both ease and accuracy.

The ARK-1s will measure various refractive parameters, including objective spherical, cylindrical refractive errors and cylinder axis. The device's accommodative measurement is useful for detecting refractive errors in pre-presbyopic patients, latent hyperopic patients and children exhibiting problems reading, according to the manufacturers.



One of the device's hallmark features is its inclusion of glare testing. The addition of this technology eases the examination of patients with cataracts, which saves clinicians time vs. traditional methods, while delivering accurate results due to its eye tracking auto alignment system.

The compact, all-in-one device features a retroillumination modality that also allows patients to view an image of their own cataracts and how they've progressed.

Visit http://www.marco.com/ark-1s.html.

Photochromic Lenses

QSpex AQuity LTD with QuasAR

New AQuity LTD with QuasAR lenses from QSpex Technologies will allow clinicians with an in-office lab to produce high quality lenses on site using the QSpex Premium Lens Fabrication System in approximately 35 minutes.

The new line of photochromic lenses will be available in both single vision and advanced digital progressive designs, in three modalities: clear, polarized and photochromic. The system gives practitioners the ability to dispense lenses to photochromic patients, eliminating their need to wait for a new prescription.

The QSpex Premium Lens System has a small office footprint and uses single use, disposable plastic molds, which avoids the need to clean each mold following use. The lenses produced by the system cover 86% of prescriptions, giving clinicians a wide range of options for their patients.

Visit www.qspex.com.

Dispensing

Kodak Lens Intelligent Dispensing Software

Signet Armorlite recently introduced the Kodak Intelligent Dispensing Software, or Kodak Lens IDS, a new dispensing tool designed with independent eye care practitioners in mind.

The Kodak Lens IDS can be used in conjunction with the newest Apple iPad with Retina display model to simplify the process of educating patients about various purchasing options.

The system is divided into three dispensing categories: frame, lens and measure. When the frame option is selected, patients will be able to view and compare the various frame options offered by the practitioner. The lens option is used to educate patients on the numerous lens modalities offered, including polarized, progressive, photochromic and AR coated. Finally, the measure section will turn the practitioner's iPad into a measuring device by using an additional back plate with a light, as well as a frame measurement clip.

The Kodak Lens IDS simplifies dispensing by turning independent practitioners' iPads into an all-in-one dispensing utility, says the company.

Visit www.signetarmorlite.com/KODAKLensIDS.

Dry Eye Relief

Bruder Eye Hydrating Compress

Bruder's microwave activated Eye Hydrating Compress helps to relieve dry eye symptoms by naturally improving meibomian gland function.

The product's microwave-activated system quickly heats up and, once applied to the eyelids, helps to melt away fatty acids that can build up in the meibomian glands, causing irritation and inflammation in the eye. The washable, reusable compress helps lipids flow unimpeded to the eye's surface, improving tear film integrity and relieving dryness.

The compress is easy to use and requires no water, Bruder says. Once the device is microwaved, it can be placed on the eye for relief of dry eye, MGD, styes, chalazions and blepharitis.

Visit www.bruderophthalmic.com. ■

Meetings + Conferences

September 2013

■ **20-22.** *New Technology & Treatments West Coast 2013.* Marriott Del Mar, San Diego. Hosted by: *Review of Optometry*. CE hours: 15. Program chair: Paul Karpecki, OD. Faculty: Mile Brujic, OD; Blair Lonsberry, MS, OD; Robert Prouty, OD. Contact Lois DiDomenico at ReviewMeetings@Jobson.com or (866) 658-1772. Visit www.revoptom.com/conferences.

■ **20-22.** *44th Annual Colorado Vision Training Conference.* YMCA of the Rockies, Estes Park, Colo. Contact Jamie Anderson, OD, FCOVD, (303) 325-2019 or jamie@highlinevisioncenter.com. Visit www.visioncare.org.

■ **21-22.** *Fall Conference 2013.* Steele Auditorium, NSU Campus, Orlando, Fla. Hosted by: Nova Southeastern University College of Optometry. Program Director: Joseph Sowka, OD. Contact Vanessa McDonald at oceaa@nova.edu. Visit http://optometry.nova.edu/ce.

■ **21-22.** *4th Annual Everything Retina Symposium.* Westin Riverwalk Hotel, San Antonio, Texas. Hosted by: University of Houston College of Optometry. CE hours: 16. Call (713) 743-1900 or visit http://ce.opt.uh.edu/live-events/ers2013.

■ **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.

■ **29.** *Glaucoma CE Lecture Seminar.* Western University College of Optometry, Pomona, Calif. CE hours: 8. For more info, email ceoptometry@westernu.edu or call (909) 706-3493. Visit www.westernu.edu/optometry-continuing-education.

October 2013

■ **2.** *6th Annual Prevent Blindness America Swing Fore Sight Golf Tournament.* Bali Hai Golf Club in Las Vegas. Contact Danielle Disch at ddisch@preventblindness.org or (312) 363-6022. Visit preventblindness.org/swingforesight.

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

■ **4.** *Hudson Valley Optometric Society Fall Seminar.* The Grandview, Poughkeepsie, NY. Hosted by: Hudson Valley Optometric Society. Featured Speaker: Eric Schmidt, OD. CE hours: 5. For more information, contact Brian Powell, OD, at drbrianpowell@gmail.com. Visit www.hvos.org.

■ **5-7.** *CAO Annual Education Conference.* Mystic Marriott Hotel & Spa, Groton, Conn. Hosted by: Connecticut Association of Optometrists. CE hours: 21. For more information, contact Lynn Sedlak, CAE, MBA at lsedlak@cteyes.org or (860) 529-1900. Visit www.cteyes.org.

■ **6-7.** *London 2013 Education Destination.* AOP Headquarters, Clerkenwell, London. Hosted by: SECO International and the Association of Optometrists. CE hours: 12. For more information, contact cletz@secostaff.com or 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.

■ **10-11, 11-13.** *VOSH International Meeting/COPR Annual Conference.* Ritz Carlton Hotel, San Juan, Puerto Rico. Hosted by: VOSH International and Colegio De Optómetras de Puerto Rico (COPR). Visit www.covd.org or call (330) 995-0718.

■ **12-13.** *3rd Annual Forum on Ocular Disease.* WDW Swan and Dolphin Resort in Orlando, Fla. Hosted by: PSS EyeCare. CE hours: 18. Contact Sonia at education@psseyecare.com or go to www.PSSeyecare.com and click on "Orlando."

■ **18-20.** *Pioneers in Optometry Regional Conference.* Renaissance Hotel & Convention Center, Tulsa, Okla. Hosted by: Oklahoma Association of Optometric Physicians. CE hours: 18. Contact Heatherlyn Burton at heatherlyn@oaop.org or call (405) 524-1075. Visit www.pioneersinoptometry.org.

■ **19-21, 23-25.** *CE in Italy: Florence and/or Castiglion Fiorentino, Tuscany.* 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.

■ **22.** *ONS Fall 2013 Educational Symposium.* Sheraton Seattle, Seattle. Hosted by: Ocular Nutrition Society. For more information, contact info@ocularnutritionsociety.org or visit www.aaopt.org/meetings/academy2013.

■ **23-26.** *Academy 2013 Seattle.* Washington State Convention Center, Seattle. Hosted by: American Academy of Optometry. Visit www.aaopt.org/meetings/academy2013.

November 2013

■ **2-3.** *Essentials in Eyecare: Board Certification Preparatory & Optometric CE Program.* Marriott Pittsburgh North, Pittsburgh, Pa. Hosted by: Pennsylvania Optometric Association. CE hours: 16. Email ilene@poaeyes.org or visit http://pennsylvania.aoa.org.

■ **2-3.** *Glaucoma Grand Rounds Program with Live Patients.* Western University College of Optometry, Pomona, Calif. CE hours: 16. Email ceoptometry@westernu.edu or call (909) 706-3493. Visit www.westernu.edu/optometry-continuing-education.

■ **7-10.** *VOA Voyages in Vision Conference.* Frenchman's Reef & Morning Star Resort, St. Thomas, US Virgin Islands. Hosted by: Virginia Optometric Association. Featured speakers: Andrew Holzman, MD, Jeffrey Michaels, OD, and Kurt Steele, OD. CE hours: 8. For more information, call Bo Keeney at (804) 643-0309. Visit www.thevoa.org.

■ **8-9.** *WOA Primary Care Symposium.* Madison Marriott West Hotel, Middleton, Wis. Hosted by: Wisconsin Optometric Association. Contact Joleen Breunig at joleen@woa-eyes.org or (608) 824-2200. Visit www.woa-eyes.org.

■ **8-9.** *2013 CE Charleston.* Doubletree Suites, Charleston, SC. Hosted by: Pacific University College of Optometry. Contact Jeanne Oliver at jeanne@pacificu.edu or (503) 352-2740. Visit www.pacificu.edu/optometry/ce.

■ **8-10.** *ALOA Annual Convention.* The Wynfrey Hotel, Birmingham, Ala. Hosted by: Alabama Optometric Association. Contact Jo Beth Wicks at jobeth@alaopt.com or (334) 273-7895. Visit www.alaopt.org.

■ **10.** *Virginia Academy of Optometry Annual Educational Conference.* The Inn at Fredricksburg Square, Fredricksburg, Va. Hosted by: Virginia Academy of Optometry. CE hours: 4. Featured speaker: Bruce Onofrey, OD, RPh. For more information, email vaacadoptom@yahoo.com.

■ **22-24.** *New Technology & Treatments East Coast.* Westin, Alexandria, Va. Hosted by: *Review of Optometry*. CE hours: 15. Program chair: Paul Karpecki, OD. Faculty: Derek Cunningham, OD; Douglas Devries, OD; Joseph Sowka, OD. Contact Lois DiDomenico at ReviewMeetings@Jobson.com or (866) 658-1772. Visit www.revoptom.com/conferences.

December 2013

■ **7.** *Ophthalmic Imaging 2014: Optical Coherence Tomography Applications and Future Technology.* Westin The Breakers, Palm Beach, Fla. Hosted by: Bascom Palmer Eye Institute. For more information, email bpeicme@med.miami.edu or call (305) 326-6110. Visit www.bascompalmer.org.

■ **7-8.** *30th Annual Cornea, Contact Lens & Contemporary Vision Care Symposium.* Westin Memorial City, Houston, Texas. Hosted by: University of Houston College of Optometry. CE hours: 16. For more information, email optce@uh.edu or visit http://ce.opt.uh.edu.

January 2014

■ **11-12.** *Eye Care Associates Annual Meeting and Continuing Education Program.* Williamsburg Hotel, Williamsburg, Va. Hosted by: Eye Care Associates. Presenter: Scott Morris, OD. CE hours: 12. Contact Linda Cavasos at ECA_linda@hotmail.com or (804) 356-5165. Non-members are welcome.

■ **18-20.** *25th Annual Berkeley Practicum.* DoubleTree Hotel, Berkeley Marina, Berkeley, Calif. Hosted by: University of California, Berkeley, School of Optometry. CE hours: 20. For more information, email optoCE@berkeley.edu. Visit http://optometry.berkeley.edu/ce/berkeley-practicum.

■ **19-25.** *2014 Island Eyes Conference.* Grand Wailea, Maui, Hawaii. Hosted by: Pacific University College of Optometry. For more information, contact Jeanne Oliver at jeanne@pacificu.edu or (503) 352-2740. Visit www.pacificu.edu/optometry/ce. ■

To list your meeting, please send the details to:

Jack Persico
Editor-in-Chief
Email: jpersico@jobson.com
Phone: (610) 492-1006

Advertisers Index

This advertiser index is published as a convenience and not as part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors due to spelling, incorrect page number, or failure to insert.

Merchandise Offered

Equipment and Supplies

Equipment and Supplies

Practice For Sale

Merchandise Offered

Practice For Sale

Equipment and Supplies

Frames

SOFTWARE

Equipment and Supplies

Continuing Education

Equipment and Supplies

Contact Lenses

Storage and Design

Professional Opportunities

Products and Services

Professional Opportunities

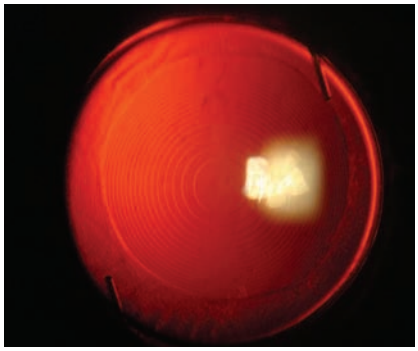
A Yen for YAG

Multifocal IOL patients may need PCO removal earlier than usual, to keep their vision sharp at all focal lengths. **By Derek N. Cunningham, OD, and Walter O. Whitley, OD, MBA**

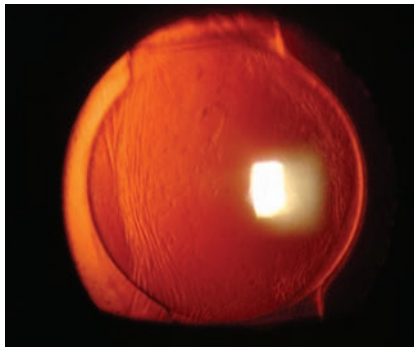
Multifocal IOLs produce superior vision at the traditional reading distance of 30cm to 40cm. This makes them ideal choices for patients who read novels or do a lot of detail-intensive near work and still want to see well in the distance. The near vision benefits of multifocals are often experienced by the patient as soon as the morning after surgery. Although these lenses produce multiple focal points, we find that patient satisfaction with these lenses is extremely high and does not correlate at all to previous success with multifocal contact lenses. The typical patient will report surprisingly good near and distance vision at the one-day post-op visit.

As you manage these patients through their recovery period, however, be very mindful of how sensitive this technology is to visual degradation. Because multifocal IOLs split the available light, they are highly susceptible to visual degradation from a poor ocular surface and mild posterior capsule opacification. Even the slightest amount of macular edema can produce symptomatic blur that is much more bothersome to the patient than would be experienced with a monofocal lens. Be sure to treat any surface disease aggressively and look closely at the posterior capsule in any patient with visual complaints.

It is not uncommon to have multifocal patients with 20/20 visual acuity claim that they do not see well in the distance if there is mild capsular opacification. At every post-op visit, be mindful to closely look at the posterior capsule and note the presence of any irregularity. As a general rule, we teach students that if they can see the posterior capsule behind a multifocal lens and patients are having difficulties with their vision, surgical removal should be considered.



Mild capsular fibrosis in a symptomatic patient with a multifocal intraocular lens implant.



Significant posterior capsular fibrosis in an asymptomatic patient with a monofocal lens.

Early Intervention Pays Off

The timeframe for capsule removal may be as early as one month postoperatively, depending on the presenting symptoms.

If there is significant residual anterior chamber inflammation, you will want to wait until the anterior chamber is quiet before scheduling the YAG capsulotomy. This procedure will open a communicating cavity with the posterior pole and could increase the risk of posterior pole inflammation if the anterior chamber is still inflamed.

If the anterior chamber is quiet, a YAG could be scheduled if the patient is symptomatic or not refractable to 20/20. The YAG capsulotomy procedure takes as little as 10 seconds and is usually painless for the patient. The patient does need to be dilated before the procedure, and may not notice an immediate visual benefit due to the dilation.

The main complications to look for after this procedure include intraocular pressure spikes, anterior chamber inflammation (rare), inadvertent pitting of the lens by the laser (rarely visually significant), cystoid macular edema and retinal detachment. Patients can be seen within days of the procedure and visual symptoms should be better.

If posterior capsule opacification is caught early, a YAG capsulotomy can save a multifocal patient a lot of visual distress and help to keep your comanaged patients happy. ■

14 CE Credits*
(COPE approval pending)

2014 NEW TECHNOLOGIES AND TREATMENTS IN VISION CARE

... *Review* Meetings of Clinical Excellence

JANUARY 16-19

ARUBA 2014

CE COURSE TOPICS

- Posterior Segment Grand Rounds
- Glaucoma Diagnosis & Management
- Anterior Segment Grand Rounds
- Technological Innovations in Eye Care
- Ocular Manifestations of Systemic Disease
- Ocular Surface Disease Diagnosis & Treatment
- New Meds / Pharmaceuticals
- Nutrition

Photo Courtesy of the Aruba Tourism Authority

5 WAYS TO REGISTER:

ONLINE: www.revoptom.com/aruba2014
EMAIL Lois DiDomenico: ReviewMeetings@Jobson.com
MAIL: Review Group Meetings c/o Jobson
11 Campus Blvd., Ste. 100
Newtown Square, PA 19073
PHONE: 866-658-1772
FAX: 610-492-1039

$100 OFF
Register by Nov. 1st

The Westin Resort & Casino, Aruba

J.E. Irausquin Blvd. 77
Palm Beach, Aruba

Hotel Reservations

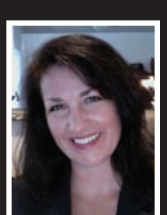
Oceanview Rooms:$269/night
For reservations, call: 888-248-8749
Discounted room rates limited. Identify yourself as a participant of "Review of Optometry" for group rate. Room rates available 3 days pre/post conference.

SPEAKERS:

Paul Karpecki, OD
Program Chair

Jimmy Bartlett, OD

Ben Gaddie, OD



Kimberly Reed, OD

REVIEW OF OPTOMETRY

cope
*Approval pending

Diagnostic **Quiz**

I'm Interested in Your Digits

By Andrew S. Gurwood, OD

History

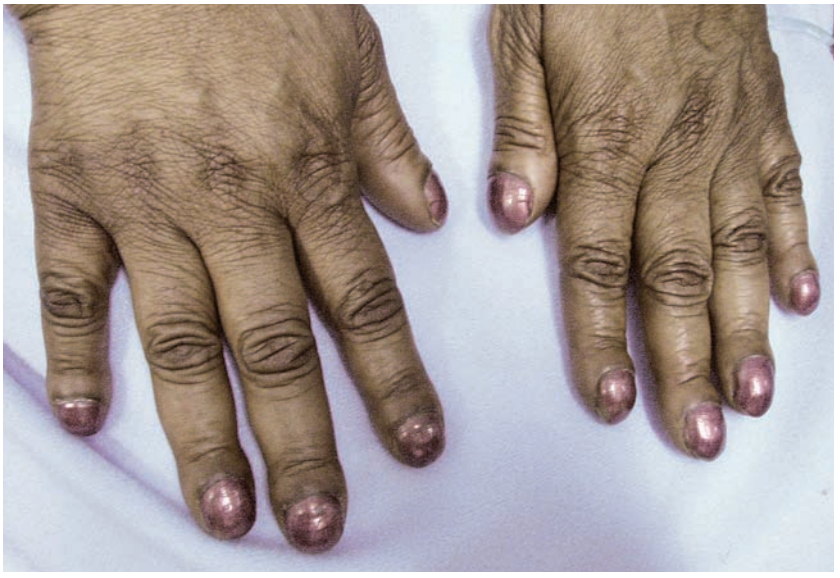
A 58-year-old black female presented for an ocular health evaluation with a chief complaint of difficulty reading. Her ocular history was noncontributory.

Her systemic history was remarkable for hypertension, for which she was compliant and properly medicated. She reported no known allergies.

Diagnostic Data

Her best-uncorrected visual acuity measured 20/25 OU at distance and near. Her external examination was within normal limits, and she exhibited no afferent pupillary defect.

Her anterior segment examination was normal OU. Intraocular pressure measured 14mm Hg OU. The dilated fundus examination also was within normal limits, with quiet grounds, normal posterior poles and distinct optic nerves. Her cup-to-disc ratio appeared to be 0.2 x 0.2.



External inspection of our 58-year-old patient uncovered this finding. What is it?

The significant external observation is illustrated in the photograph.

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. ■

Retina Quiz Answers *(from page 101):* 1) a; 2) b; 3) d; 4) a; 5) c.

Next Month in the Mag

October features our Practice Management Report.
Topics include:

- *Annual Income Survery*
- *Lessons Learned from Corporate Optometry*
- *The Essentials of Benchmarking Performance*

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.
Or, write to *Review of Optometry*, 11 Campus Blvd., Suite 100, Newtown Square, PA 19073.

REVIEW OF OPTOMETRY (ISSN 0147-7633) IS PUBLISHED MONTHLY, 12 TIMES A YEAR BY JOBSON MEDICAL INFORMATION LLC, 100 AVENUE OF THE AMERICAS, NEW YORK, NY 10013-1678. PERIODICALS POSTAGE PAID AT NEW YORK, NY AND ADDITIONAL MAILING OFFICES. POSTMASTER: SEND ADDRESS CHANGES TO REVIEW OF OPTOMETRY, PO BOX 2025, SKOKIE, IL 60076. SUBSCRIPTION PRICES: US: ONE YEAR $56; TWO YEARS $97, CANADA: ONE YEAR $88, TWO YEARS $160, INT'L: ONE YEAR $209, TWO YEARS $299. FOR SUBSCRIPTION INFORMATION CALL TOLL-FREE (877) 529-1746 (USA ONLY); OUTSIDE USA, CALL (847) 763-9630 OR FAX (847) 763-9631. PUBLICATIONS MAIL AGREEMENT NO: 40612608. CANADA RETURNS TO BE SENT TO BLEUCHIP INTERNATIONAL, P.O. BOX 25542, LONDON, ON N6C 6B2.

"We are determined to become a company that is **100% ECP-centric** by delivering products and services that will provide foundational value to your practice."

Dear Colleagues,

I am thrilled to be leading SynergEyes into a new era: an era that is all about you, the independent eye care professional. It is our sincere intention to be your partner by helping you to increase patient satisfaction and loyalty, to grow your contact lens business, and to increase your practice profitability. I am committed to creating a company that understands the needs of the independent practice and I intend to implement a corporate culture reflecting that understanding.

We have a lot of exciting changes that will soon be taking place at SynergEyes, including a thorough **modernization of company policies and procedures** that will make it easy and enjoyable for you to do business with us. We are conducting a comprehensive review of all customer-facing functions to uncover new ways to **enhance our service level and your satisfaction**. We are also working to bring you product line extensions and improvements to meet the needs of more patients in your practice, and our commitment to innovation will soon be demonstrated with a number of **new products already in the pipeline**. And finally, we are making significant **improvements in our manufacturing process in order** to deliver the highest quality products to you and your patients.

As an optometrist who spent 33 years in private practice, I understand the needs of you and your patients. I know the rigors and challenges of independent practice and I am committed to making SynergEyes a company that is here for you. I look forward to bringing you the new SynergEyes: ***the leading global contact lens company for the independent eye care professional.***

I am genuinely interested in hearing from you. Please visit **http://SynergEyes.com/Partner/** to share your thoughts on how we can be a true partner to the independent ECP.

Very Sincerely,

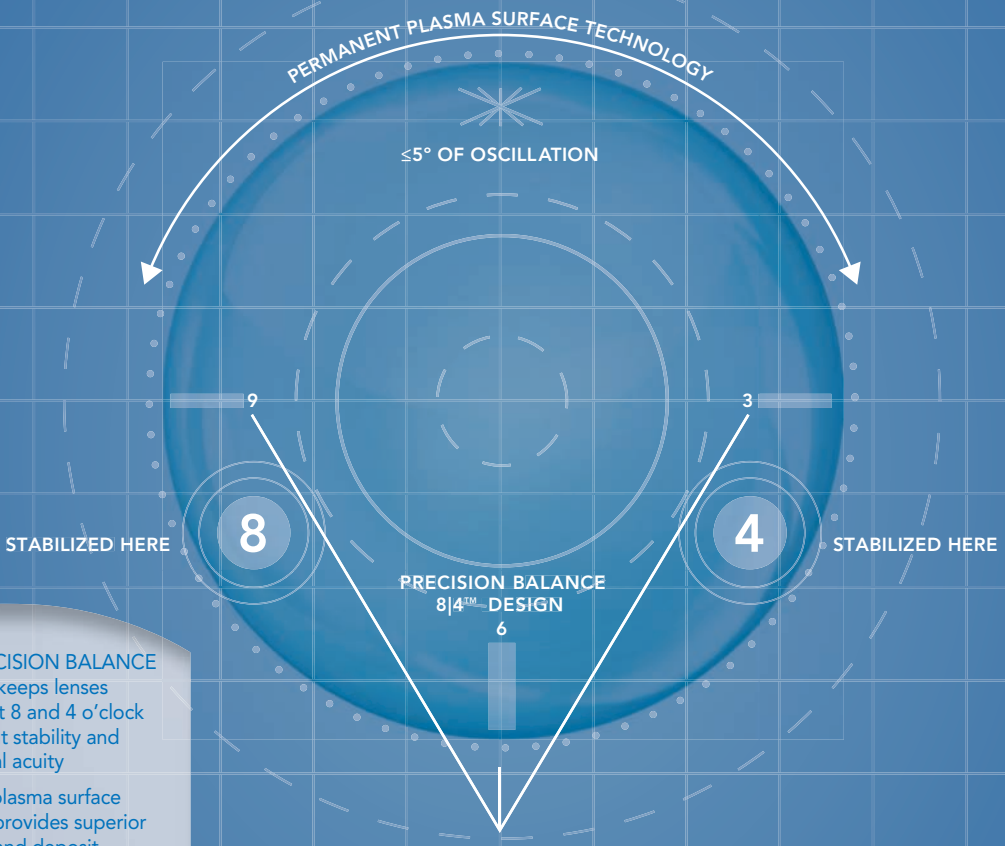
James K. Kirchner, O.D.

James K. Kirchner, O.D.
President & CEO

SynergEyes

STABILITY

IS THE CORE OF OUR DESIGN



- Unique PRECISION BALANCE 8|4™ Design keeps lenses positioned at 8 and 4 o'clock for consistent stability and reliable visual acuity
- Permanent plasma surface technology provides superior wettability[1] and deposit resistance[2,3]** for consistent comfort from Day 1 to Day 30[4]

AIR OPTIX® for Astigmatism

Contact Lenses

Visit **myalcon.com** to learn why AIR OPTIX® for Astigmatism contact lenses are the lenses of choice for many ECPs

Engineered for sustained performance

*Dk/t = 108 @ -3.00D, -1.25 x 180. **Compared to Biofinity^, PureVision^, ACUVUE^ OASYS^, ACUVUE^ ADVANCE^, and Avaira^ lenses. ^Trademarks are the property of their respective owners.

Important information for AIR OPTIX® for Astigmatism (lotrafilcon B) contact lenses: For daily wear or extended wear up to 6 nights for near/far-sightedness and astigmatism. Risk of serious eye problems (i.e. corneal ulcer) is greater for extended wear. In rare cases, loss of vision may result. Side effects like discomfort, mild burning or stinging may occur.

References: 1. In vitro measurement of contact angles on unworn spherical lenses; significance demonstrated at the 0.05 level; Alcon data on file, 2009. **2.** Ex vivo measurement of lipid deposits on lenses worn daily through manufacturer-recommended replacement period; AOSept Plus used for cleaning and disinfection; significance demonstrated at the 0.05 level; Alcon data on file, 2008. **3.** 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. **4.** Davis RL, Eiden SB. Evaluation of changes in comfort and vision during weeks 3 and 4 of monthly replacement silicone hydrogel contact lenses. American Academy of Optometry; 2012; E-abstract 125401.

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

Rx only

Alcon®

a Novartis company