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REVIEW® OF OPTOMETRY

November 15, 2014

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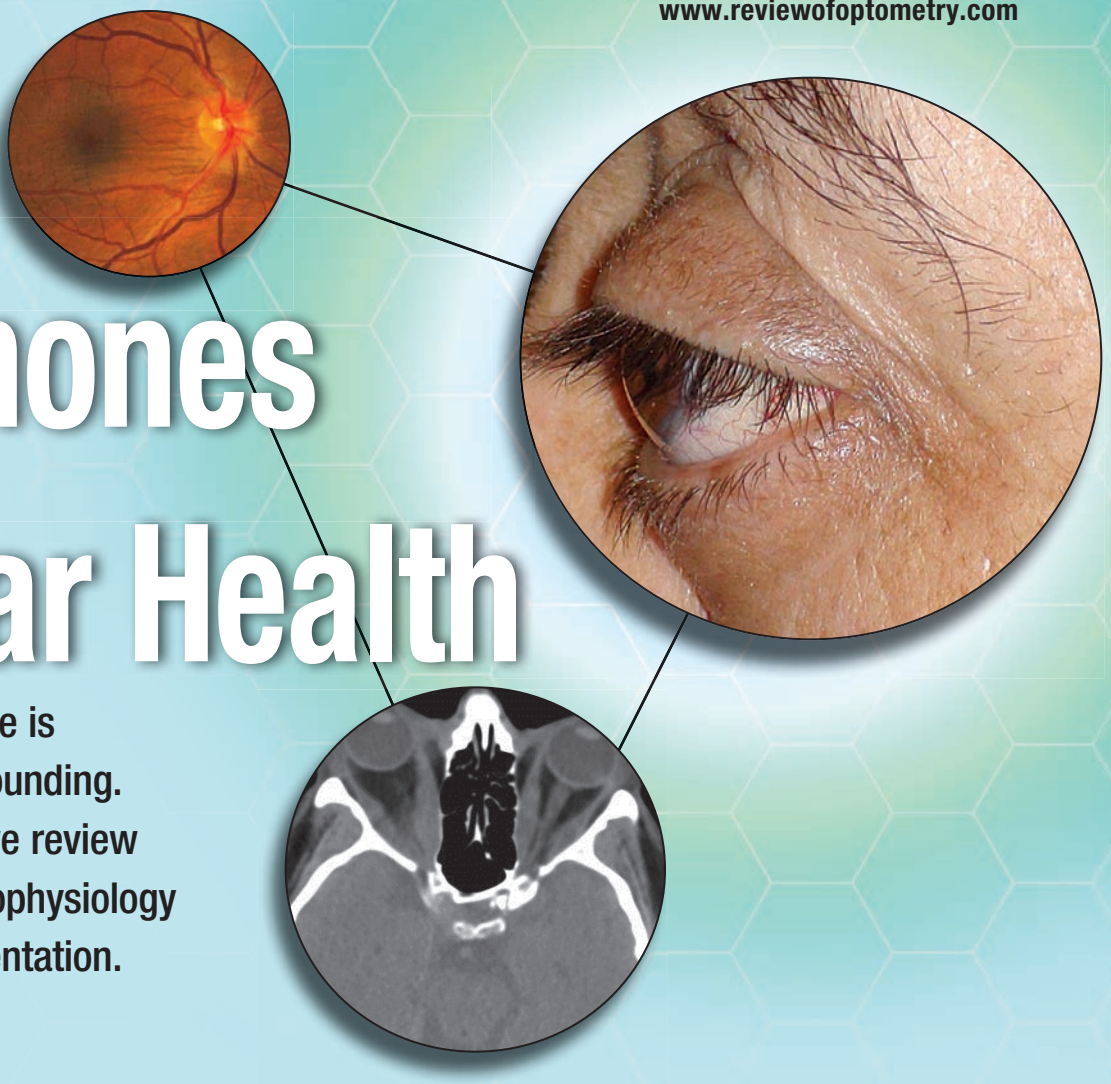

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Thyroid eye disease is complex and confounding. This comprehensive review connects the pathophysiology to its clinical presentation.

Page 53

Practice Management Focus: Get Your Staff in Sync

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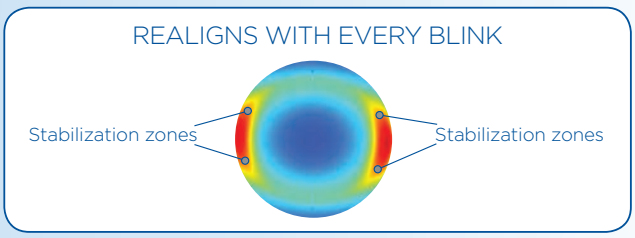

ANSI=American National Standards Institute; ISO=International Organization for Standardization.

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.

†Helps protect against transmission of harmful UV radiation to the cornea and into the eye.

WARNING: UV-absorbing contact lenses are NOT substitutes for protective UV-absorbing eyewear such as UV-absorbing goggles or sunglasses, because they do not completely cover the eye and surrounding area. You should continue to use UV-absorbing eyewear as directed. **NOTE:** Long-term exposure to UV radiation is one of the risk factors associated with cataracts. Exposure is based on a number of factors such as environmental conditions (altitude, geography, cloud cover) and personal factors (extent and nature of outdoor activities). UV-blocking contact lenses help provide protection against harmful UV radiation. However, clinical studies have not been done to demonstrate that wearing UV-blocking contact lenses reduces the risk of developing cataracts or other eye disorders. Consult your eye care practitioner for more information.

‡UV-blocking percentages are based on an average across the wavelength spectrum.

¶This observational/surveillance registry relied on patient reports of symptomatic adverse events that led them to seek clinical care. These results should be considered in conjunction with other clinical results on the safety and efficacy of daily disposable etafilcon A contact lenses, which also generally show low rates of such events. Although no symptomatic infiltrative events were reported in this study, such events can occur with daily disposable lenses, including 1-DAY ACUVUE® MOIST®, as noted in the product labeling.

||Based on *Tyler's Quarterly Soft Contact Lens Parameter Guide*; June 2014.

1. Chalmers RL, Hickson-Curran SB, Keay LJ, Gleason W. Safety of hydrogel and silicone hydrogel daily disposables in a large post-market surveillance registry—the TEMPO registry. Presented at: ARVO 2014 Annual Meeting: May 4-8, 2014; Orlando, FL.

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VOL. 151 NO. 11 ■ NOVEMBER 15, 2014

IN THE NEWS

Optometry mourns the loss of **Woody Witt**, president of **Woodlyn**, who died October 12 after a three-year battle with cancer. Mr. Witt has been a fixture in the ophthalmic industry for decades. CEO responsibilities are now under the direction of **Eileen Bowen-Witt**, who has been an executive with the company since its inception. Day-to-day operations, delivery of products, customer service and plans for 2015 will continue with the current management team and staff, the company announced.

The **University of Missouri-St. Louis** (UMSL) announced a new $17 million **Patient Care Center** for its **Colleges of Optometry and Nursing**. Scheduled to open in 2016, the new 48,000-square-foot facility will enhance and expand the services offered through the existing **University Eye Center**, which it will replace. The new two-story Patient Care Center will provide space for clinical education and research, as well as comprehensive eye and vision care, UMSL says. Each clinic will feature student-faculty consultation space as well as individual and group learning space, which will promote collaboration between the students, faculty and staff. Funding for the new center is coming in part from a supplemental fee that will be assessed to optometry students, the university says.

Patient Care Center at UMSL

Eye on Ebola: FAQs for Optometrists

Don't participate in the panic, but do take reasonable and responsible precautions. **By John Murphy, Executive Editor**

The risk of an Ebola outbreak in the United States is very low. However, "I've been hearing loud and clear from health care workers from around the country that they're worried," says Thomas Frieden, MD, director of the Centers for Disease Control and Prevention (CDC).[1]

To prevent worry, yet inform you of appropriate precautions and safeguards, here are some FAQs about Ebola just for eye care professionals.

• Can Ebola be transmitted through tears or contact lenses?

Possibly, perhaps probably, but it's not yet conclusively known whether the tears (or tear fluid on a contact lens) can carry the virus.

Ebola is transmitted by physical contact with infected bodily fluids (the most infectious being blood, feces and vomit, as well as breast milk, urine and semen). But studies implicating saliva and tears "were extremely limited in sample size and the science is inconclusive," according to the World Health Organization (WHO).[2] "In studies of saliva, the virus was found most frequently in patients at a severe stage of illness. The whole live virus has never been isolated from sweat."

Ebola is not spread through drinking water or food.

• Can Ebola be transmitted through the air?

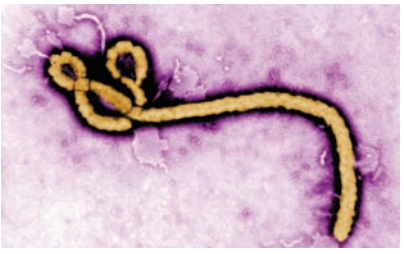

Image: CDC/Frederick A. Murphy

Transmission electron micrograph of an Ebola virus virion.

Ebola could potentially be an aerosol-transmissible disease, but the information is inconclusive at this time.[3] Anecdotal and experimental evidence suggests that Ebola can be transmitted by the aerosol route, although direct exposure—via a skin break or mucous membrane—is the most efficient way for Ebola to be transmitted.[3]

The CDC and WHO recommend the use of facemasks for health care workers providing routine care to patients with Ebola virus disease and respirators when "aerosol-generating" procedures are performed.[3]

• Can the virus spread while the infected patient is asymptomatic?

No. "The incubation period, or the time interval from infection to onset of symptoms, is from two to 21 days," the WHO says. "The patients become contagious once they begin to show symptoms. They are not contagious during the incubation period."[4]

(Continued on page 6)

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Ebola: FAQs for Optometrists

What Precautions and Practices Should be Performed in-office?

- If you or one of your staff is sick, stay at home. Likewise, ask patients to inform you if they are sick, and reschedule the appointment if it's not essential.[8]
- Wear gloves when touching bodily fluids, blood, excretions or mucous membranes.
- Wear eye protection during patient examination.
- Wear a facemask for close encounters.
- Cover your mouth when coughing or sneezing; ask staff and patients to do the same.
- Routinely disinfect instruments and surfaces that patients touch or use.
- Use special care when handling needles, scalpels and other sharp objects.
- Wash your hands frequently with soap and water for at least 20 seconds, or generously apply an alcohol-based hand sanitizer.
- Provide hand sanitizer at the front desk and post infection control posters in the waiting area.

(Continued from page 4)

Typical signs and symptoms include sudden-onset fever, intense weakness, muscle pain, headache and sore throat. This is followed by vomiting, diarrhea, rash, impaired kidney and liver function, and in some cases both internal and external bleeding.[4]

Because symptoms take up to three weeks to appear, be sure to ask patients if they have traveled internationally in the past month. Further, display signage in your office prompting recent international travelers to inform you or a staff member.

In the extremely unlikely event that you encounter a patient who may have been exposed to Ebola virus, you are required to contact local, state and federal health authorities (www.cste.org/?page=StateEpi).

• How long does the virus live on surfaces?

Ebola virus can survive on dried-on surfaces, such as doorknobs and countertops, for several hours; however, in bodily fluids (such as blood), the virus can survive up to several days at room temperature, the CDC says.[5] Take note that this information comes from one experimental study "performed under environmental conditions that favor virus persistence," according to the CDC.[6] "This study found that under these ideal conditions, Ebola virus could remain active for up to six days."[6]

However, "in the only study to assess contamination of the patient care environment during an outbreak, conducted in an African hospital under 'real world conditions,' virus was not detected by either nucleic acid amplification or culture in any of 33 samples collected from sites that were not visibly bloody," the CDC reports.[6] With consistent daily cleaning and disinfection practices, "the persistence of Ebola virus in the patient care environment would be short—with 24 hours considered a cautious upper limit," the CDC estimates.[6]

• What disinfectants can kill the Ebola virus?

Ebola virus is susceptible to 3% acetic acid, 1% glutaraldehyde, alcohol-based products and dilutions (1:10 to 1:100 for ≥10 minutes) of 5.25% household bleach and bleach powder.[7]

Ebola also can be inactivated by heating for 30 to 60 minutes at 60°C (140°F), boiling for five minutes or gamma irradiation (1.2 x106 rads to 1.27 x106 rads) combined with 1% glutaraldehyde. Ebola virus is also moderately sensitive to UVC radiation.[7]

• Last but not least, maintain perspective.

For comparison, keep in mind that 5% to 20% of the US population comes down with the flu each year.[9] More than 200,000 Americans are hospitalized from seasonal flu-related complications, and flu-associated deaths each year in the US range from a low of about 3,000 people to a high of about 49,000, the CDC estimates.[9]

So, if nothing else, get a flu shot—and have your staff get them, too.

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–Dr. John Derickson, Jacksonville, FL

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REFERENCE: 1. Results from a 22-investigator, multi-site study of Bausch + Lomb ULTRA® contact lenses with MoistureSeal® technology, on 327 current silicone hydrogel lens wearers. After 7 days of wear, subjects completed an online survey. Subjects rated performance across a range of attributes. Preference comparisons represent only those subjects expressing a preference. Ratio is based on the average across the silicone hydrogel lenses represented in the study.

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'Think About Your Eyes' Campaign Generates Referrals, Increases Diagnoses

The Vision Council's public education initiative, Think About Your Eyes—intended to raise awareness of ocular health and vision—has increased the volume of eye exams by 4.5% since its national rollout last year.

Those additional visits (5.2 million annually) led to the identification of more than 525,000 cases of previously undiagnosed eye disease, said Alcon, as it announced its support of the campaign.

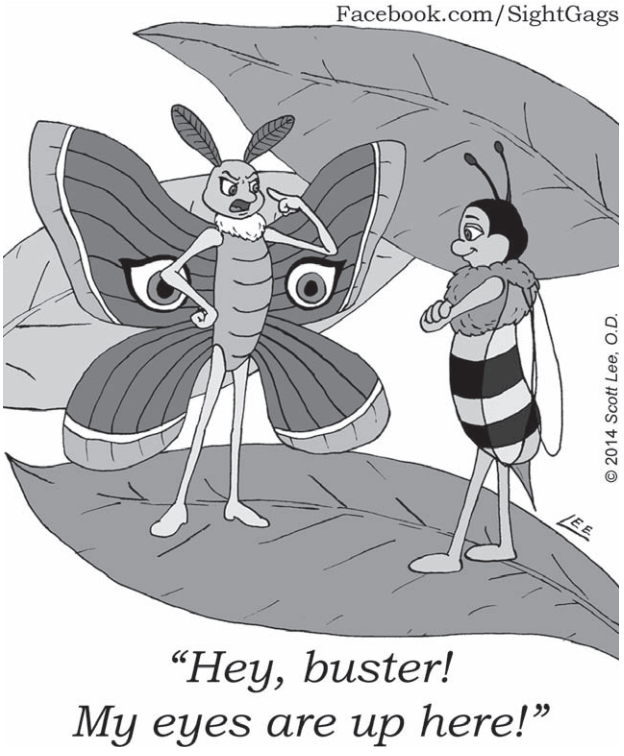
A mix of print, broadcast and digital advertising conveys educational messages about eye disease, eyestrain, children's vision and how regular eye exams can positively affect overall health. The campaign encourages consumers to schedule an eye exam by visiting thinkaboutyoureyes.com.

Participating optometrists receive referrals, promotional efforts and patient education materials, in exchange for an annual membership fee of $250 or $500.

Support comes from the Vision Council, the AOA and industry, with Alcon being the newest partner to sign on.

"This campaign is about doing the right thing for patients. It's not about specific companies or products," said Eric Bruno, Alcon's VP and General Manager of US Vision Care. The company's support, he added, will "help amplify the campaign to reach even more people with these important messages."

Sight Gags by Scott Lee, OD



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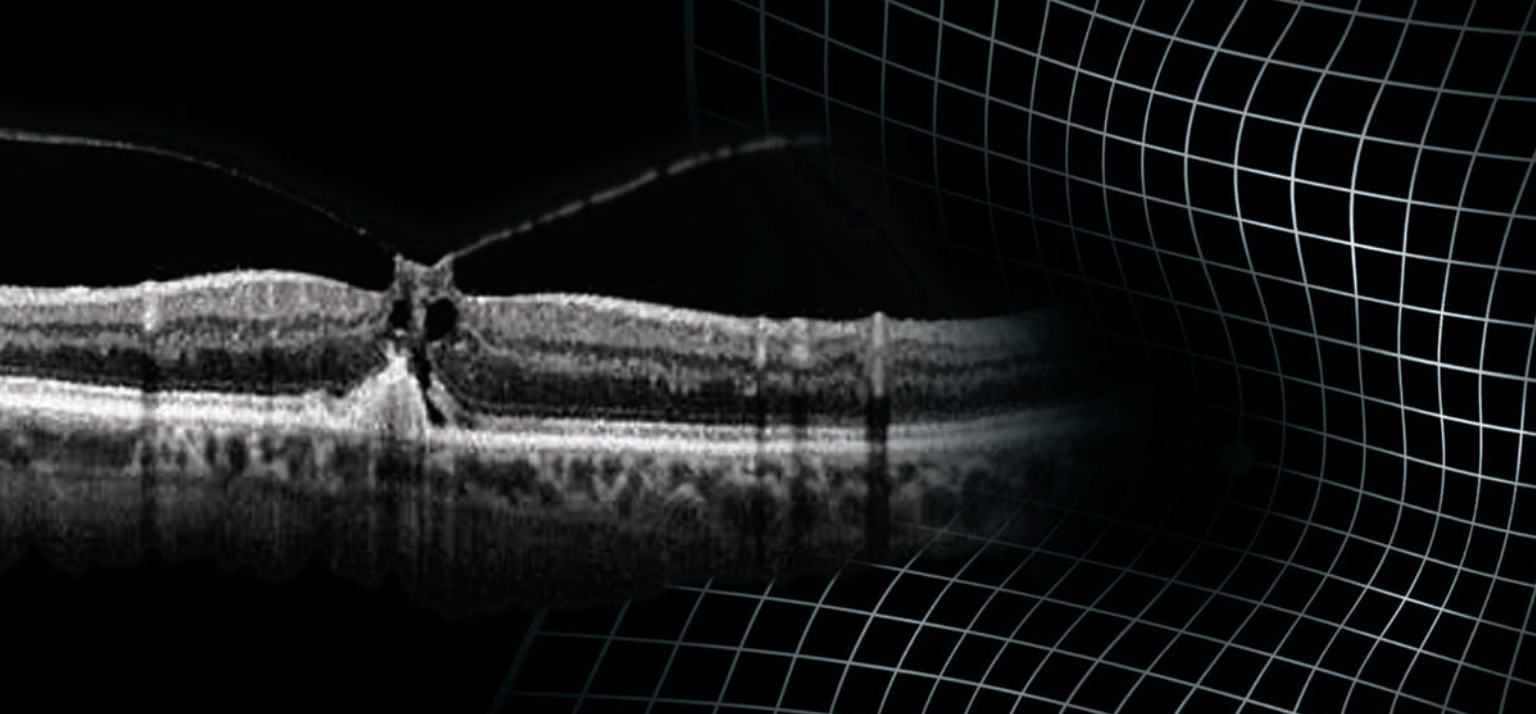

SYMPTOMATIC VITREOMACULAR ADHESION (VMA)

SYMPTOMATIC VMA MAY LEAD TO VISUAL IMPAIRMENT FOR YOUR PATIENTS[1-3]

IDENTIFY | Recognize metamorphopsia as a key sign of symptomatic VMA and utilize OCT scans to confirm vitreomacular traction.

REFER | Because symptomatic VMA is a progressive condition that may lead to a loss of vision, your partnering retina specialist can determine if treatment is necessary.[1-3]

THE STEPS YOU TAKE TODAY MAY MAKE A DIFFERENCE FOR YOUR PATIENTS TOMORROW

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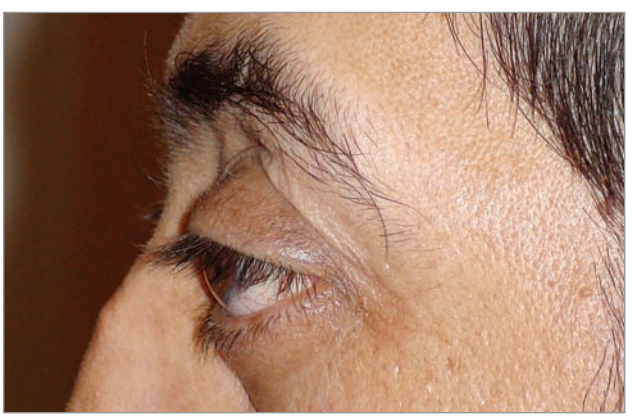

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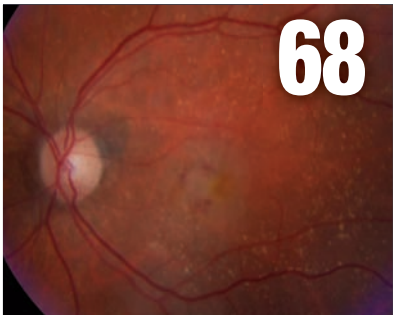

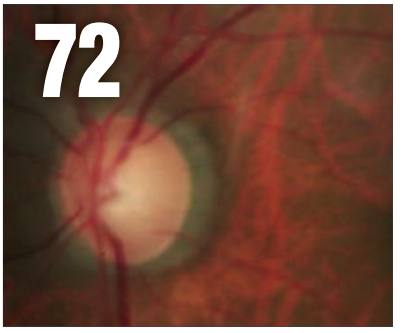

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Crizal® Prevencia™ and the Blue Light Hazard

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.

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Syncing Up

A well-coordinated effort among everyone in the practice allows you to achieve more than ever before. **By Jack Persico, Editor-in-Chief**

One long-standing complaint about health care in the US is how little time patients get in front of their doctors. As patients, we fill out as much information as possible before the visit, nurses and techs record the history and perform any testing, then the doctor comes in for the big finale—and spends most of the time with their back to you as they enter their notes in the EHR. Something as fundamentally personal as a visit to the doctor is steadily losing its human connection.

But optometry has been able to buck that trend. You'd be hard-pressed to find another medical profession where the doctors spend such a generous amount of time with their patients. This is one of optometry's great strengths, and perhaps its Achilles' heel. Because if the profession is to grow—taking on the lion's share of primary eye care, which the trends plainly show is the only feasible way to meet demand—ODs will have to cede some of that precious face time.

Optometrists have maintained their close rapport with patients while other doctors have seen more and more intermediaries wedged in between. Optometry's success here is not something anyone is keen to lose. The trick, obviously, is to preserve that patient connection while letting staff members play a bigger role.

In the somewhat controversial AOA manpower study released earlier this year, respondents said they could take on about 20 more patient visits per week, adding 32% more exams to their schedule—without adding office hours or staff members. Practice circumstances will vary, but that sounds like a compelling case for more robust use of optometric staff.

This month's special series on staff management seeks to help you hire, develop and retain talented staff—the sort of professionals that you'll be proud to see take on some of the work you might otherwise feel the need to handle personally.

Delegate, Don't Abdicate

Entrusting some of the more routine elements of the patient encounter to others is surely a good place to start looking for productivity gains. "Your job as an optometrist is to interpret data, not to collect it," writes Kara Gibbs, OD, in her article on staff delegation (page 42). Let qualified staff members acquire the data, so that you can concentrate on acting upon it.

Might that even extend to refractions? Handing over the keys to the phoropter doesn't sit well with most optometrists, understandably. It's an essential service, the one that gave optometry its name, and—rightly or wrongly—what's most often associated with the profession. But it's a time-consuming procedure and some argue that the doctor's expertise might be put to better use if devoted to clinical decision making. In this month's *Review of Cornea & Contact Lenses*, practice management guru Gary Gerber, OD, even goes so far as to advocate delegating not just refractions but contact lens fits too.

Everyone will have a different comfort level with the thought of delegating such core components, but it's something to hash out, both philosophically and pragmatically.

Hiring good people and then keeping them in the fold creates much-needed stability that allows the practice to hum along busily, while enhancing the patient experience. Familiarity is especially comforting to those in need of medical care. You've chosen optometry as a life-long endeavour, but maybe not everyone in your practice has; medical staff tend to drift among practices and professions.

To keep staff turnover from wiping out your productivity, encourage that same sort of commitment to optometry in your team. "Our staff considers what they do a career, not a job," Alan Bishop, OD, says in the article on tech certification (page 36). Invest in them and they'll not only perform better, they'll stick around. In his article on staff recruitment and retention (page 28), Brian Rogoff, OD, stresses staff development, not mere training. "A dog can be *trained*, but an individual who can make independent decisions and contributions should be *developed*."

That—educated, motivated team members who act independently and enable your clinical decisions—ideally creates the continuity of care you want patients to experience. Even if you aren't always the one on the other side of the chair. ■

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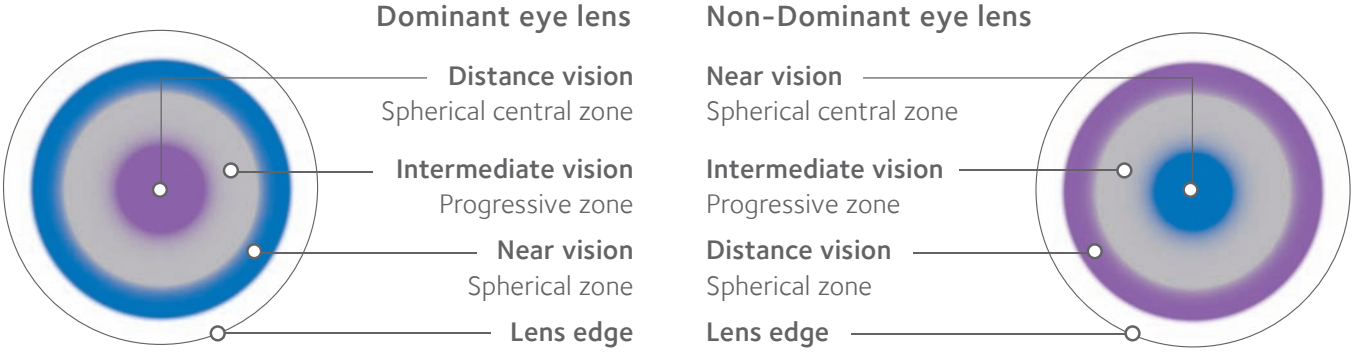

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Epic Fail

I'm terrible at taking tests. Always have been. Always will be. I once took a personality test in a magazine—and I failed. **By Montgomery Vickers, OD**

The fall is back-to-school time. It always brings back memories of dear ol' Pennsylvania College of Optometry and the relentless torture of quizzes and tests that beat the stupid out of us by the time we received our doctorates.

Man, I still hate tests. Some people are amazing test takers. Most of us are not. At PCO, we had an Honors/Pass/Fail grading system. This worked well for me as I figured my best move was to Pass, which I guess I did. The reason I'm guessing is that after four years of undergrad premedical throat-cutting, I decided I'd never check a test score again. So, throughout four years of optometric education, I never checked one score. I figured they'd let me know if I failed.

And once they actually did just that. After our very first physiological optics test, I was informed that I had scored the lowest grade in the history of physiological optics. But then, on the second quiz two weeks later, I scored the highest grade in the class.

The professor called me into his office to figure out how I turned things around so quickly. My explanation was simple: "When I took the first test, I used my slide rule to figure out the answer, and that's what I wrote down. When I took the second test, I used my slide rule to figure out the answer, and then I wrote the exact opposite down."

He seemed pleased that I finally understood physiological optics.

But the tests in optometry school covered so much information! How could anyone ever remember such volume? It wasn't easy. The good news is that I had come from a tough little liberal arts school, Washington and Lee University, where I spent four years drowning in the huge volume of data I was expected to know to achieve my undergraduate degree and become excellent at Trivial Pursuit.

I had developed a study technique where I wrote down everything, enough to fill 50 pages, which I creatively called "notes." I then condensed this into 10 pages I called "note notes," and then to two pages which I called "note note notes," and then to one page I called "note note note notes," and then to one 5x7" card called "note note note note notes," and then… Well, you get the idea.

So, all I had to do the morning of the test was refer to a little 3x5" card and all that data came flooding back. Genius!

My favorite test question of all time came in 1971 when I was a freshman taking my first history test. It went like this: "Why do you think Constantinople became the capitol city of the Roman Empire?"

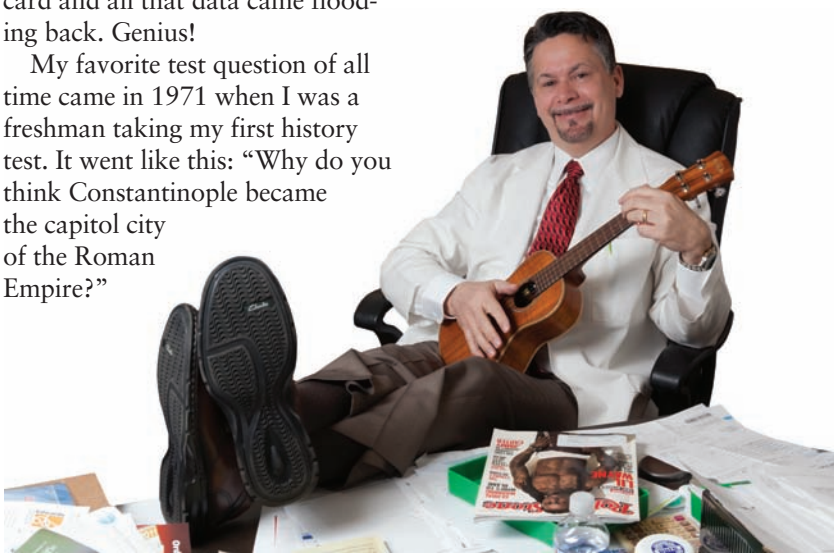
I answered the crazy question the best I could. So I was horrified to find my answer was marked incorrect on the test results.

I made an appointment with the professor, a published and world-renowned historian. I asked him to read the question. After he said, "Why do you think—" I said, "STOP!" and I explained that there is no such thing as an incorrect answer to this question.

Then I explained that I'd revised my answer since the examination. My new answer was: "I think it was because they lost a bet!"

He laughed and changed my grade. I finally achieved a C!

But, despite such academic success, I still hate tests. And I'm studying for one right now. Hopefully, by the time I get to my "note note note note note note notes," I'll be ready and everything will fit on a postage stamp. ■



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Ocular Signs, Systemic Disease

Even though systemic disease can potentially affect the eye, third-party carriers don't pay for prognostic testing. **By John Rumpakis, OD, MBA, Clinical Coding Editor**

I often get questions regarding coding and compliance issues for clinical situations in which a systemic disease may have ocular sequelae. Sometimes there are ocular signs and symptoms related to the systemic disease, while other times there is no sign or symptom of ocular involvement, although we know the systemic condition may eventually affect the eye.

While many systemic conditions pose a risk of ocular problems, much of the supplementary ophthalmic testing is not considered medically necessary or appropriate until the patient reports symptoms or the physician observes a clinical sign. This key point is often ignored in everyday practice. Keep in mind that we generally do not get paid to document a normal ocular state even in the presence of systemic disease—unless there is a clinical sign or a symptom present.

While personally I agree with the argument that special testing—such as optical coherence tomography/digital imaging of the retina, macular pigment optical density, visual fields, electroretinography, visual evoked potential, etc.—allows you to detect ocular disease or the potential for ocular disease, the reality is that third-party carrier rules do not provide for prognostic testing.

For example, a patient could have diabetes, but presents with no symptoms and the examination reveals no diabetic ocular changes. You may argue that if you were to take a fundus photograph, you could see things that you couldn't see with your traditional ophthalmoscopic examination. However, this type of testing would be prognostic, and not based upon the clinical signs and symptoms currently present.

Of course, you can still offer the test to the patient as an out-of-pocket expense if you think that prognostic aspect is important. But the carrier won't be responsible even if you have a systemic diagnosis that provides you with a covered diagnosis for the CPT code relationship.

Keep in mind that the relationship, or mapping, of a diagnosis code to a CPT code still requires the physician to meet the definition of medical necessity in which clinical signs and symptoms are present. Simply having a covered diagnosis "mapped" to a CPT code isn't enough to meet standard coding requirements.

Systematic Coding

If you do meet this requirement, the ICD rules are fairly straightforward regarding the coding sequence of the diagnosis—systemic first, then any ocular complications or sequelae.

So, if we consider our diabetic patient, you would want to stipulate the specific type of systemic diabetes that patient has as the primary diagnosis, and then identify the ocular manifestations hierarchically after that. This is true for the current ICD-9 system that we use now and will hold true for the ICD-10 system scheduled for implementation on October 1, 2015.

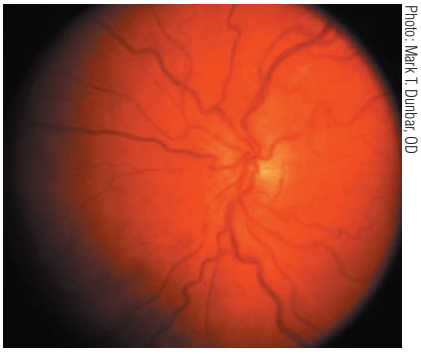

Photo: Mark T. Dunbar, OD

If a patient presents with no signs or symptoms, third-party carriers likely won't cover further testing.

One thing to note for the ICD-10: You'll need to have more detailed and more frequent communication with the primary care doctor to make sure that the specific systemic diagnoses match between your claim form and the PCP's records.

Optometric involvement in systemic disease management is a growing part of contemporary practice. Just look at optometry's growing involvement with diabetes care, as an example.

So, understanding the relationship between the disease, the ocular manifestations and the requirements for your medical record are all important issues that you must be aware of, and for which you must establish protocols in your practice. ■

Please send your questions and comments to CodingAbstract@gmail.com.

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AMD=age-related macular degeneration; CAP=College of American Pathologists; CLIA=Clinical Laboratory Improvement Amendments.

Income Survey: A Turn for the Better

Optometrists are earning more across the board, but private practice is 'the way to prosperity.' **By John Murphy, Executive Editor**

Optometrists are working smarter, not harder—and actually earning more in the process. They're adding associate doctors to spread the workload, and delegating to technicians to see more patients. They're adopting the medical model while cutting back on low-paying vision plans.

"I'm working less, but making the same due to better medical model billing," says Steven M. Smith, OD, of The Eye Care Clinic in Knoxville, Tenn.

Working smarter is finally paying off. Optometrists (particularly those who own a solo or group practice) are now earning more than ever. Of course, many doctors—especially newer ones—are still struggling with student loan debt while building up their practices.

These are some of the highlights of *Review of Optometry*'s latest annual Income Survey. The survey was emailed to more than 36,000 of our readers. Nearly 8,400 viewed the email and 881 optometrists responded.

Steven M. Smith is one of many ODs who have increased their efficiency and expanded their care without losing revenue. In many cases, they've gained new income.

Not-So-Average Income

Annual income for full-time optometrists (including both employed and self-employed ODs) averaged $148,220 in 2013, according to our survey. (This is your pre-tax income, not your net income, which is income *after* Uncle Sam takes his slice.)

Does this salary seem high for the average OD? For comparison, the Bureau of Labor Statistics estimates the US optometrist's average annual wage to be $111,640, according to data released in May 2013. But buried in the Bureau's fine print is that this estimate does not include self-employed workers, and doubtlessly many high-earning private practitioners are self-employed.

Thus, we feel that our survey's findings reasonably and fairly reflect full-time US optometrists' income.

Salary Specifics

Optometrists' incomes vary by type of employment and years in practice, so measuring your income against the average may not tell you what you want to know. So, we

break it down to give you a more accurate assessment of optometric income.

For instance, the average salary for optometrists who are employed (by another optometrist or MD, a commercial firm, an HMO or PPO, an optometry school or in other jobs) was $116,932 in 2013.

ODs who own their own businesses fare better than employed optometrists. Self-employed ODs (whether in solo practice, partnership, group practice, franchises or those who work as independent contractors) had an average salary of $179,438.

Solo practitioners—the largest group among self-employed ODs—brought in a healthy average of $168,304, but partnership or group practice brings home an even bigger slice of bacon, with an average income of $235,943, according to our survey.

"Private practice is the way to prosperity in this industry," says John E. Hilke, OD, of Hillsborough Vision Center, in Hillsborough, NJ.

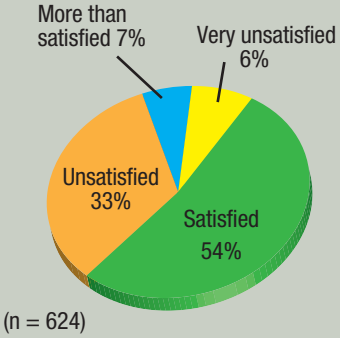
Bear in mind that very high or very low individual salaries may skew the results in surveys such as this one. So, median income—the midpoint of all responses—may provide a better snapshot of the typical OD's earnings. Median income for all optometrists was $117,000 in 2013. For self-employed ODs, it was $144,000, and $107,000 for employed ODs.

Another benchmark to consider is years in practice. As you might predict, highly experienced doctors earn more than newer docs. Specifically, ODs who've been in practice for more than 30 years averaged the most: $201,359. (Bear in mind that these are full-time optometrists, so semi-retired ODs in this bracket were not included.) ODs with 21 to 30 years of experience

Highlights of *Review of Optometry*'s 2013 Income Survey

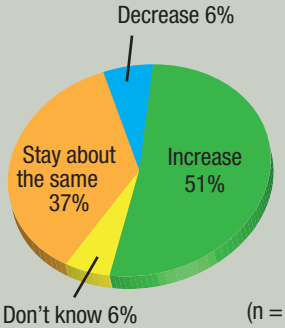
Average Income	$148,220	(n = 635)
Median Income	$117,000	(n = 635)
Average Income by Years in Practice		
Less than 10 years	$109,341	(n = 271)
11 to 20 years	$148,356	(n = 106)
21 to 30 years	$169,204	(n = 131)
More than 30 years	$201,359	(n = 106)
Self-employed ODs Average Income		
All self-employed ODs	$179,438	(n = 319)
Solo practitioner	$168,304	(n = 171)
Partner/group practice	$235,943	(n = 87)
Independent contractor	$117,416	(n = 54)
Other	$184,909	(n = 11)
Employed ODs Average Income		
All employed ODs	$116,932	(n = 313)
Other OD or MD	$112,469	(n = 183)
Commercial firm	$118,553	(n = 51)
Academic institution	$120,508	(n = 19)
HMO/PPO	$154,846	(n = 13)
Hospital/VA center	$120,917	(n = 12)
Other	$125,058	(n = 19)
Average Gross Revenue – All ODs	$861,728	(n = 365)
Median Gross Revenue – All ODs	$680,000	(n = 365)
Self-employed ODs Average Gross Revenue	$798,724	(n = 264)
Self-employed ODs Median Gross Revenue	$658,000	(n = 264)
Employed ODs Average Gross Revenue	$1,026,411	(n = 101)
Employed ODs Median Gross Revenue	$750,000	(n = 101)

How satisfied are you with your current income?



(n = 624)

Next year, do you expect your income or salary to…?



(n = 604)

averaged $169,204, and those with 11 to 20 years averaged $148,356. Optometrists with less than 10 years' experience earned an average of $109,341.

"Managing a business has to be learned. It hasn't come naturally to me," says Trisha Vance, OD, who has faced a steep learning curve in her first few years in practice at Vance Eye Care, in Chardon, Ohio. "Applying what I have learned, I am confident that my net percentage will grow in the coming years."

Satisfied with Salary

This year's survey finds that 61% of respondents say they are either "satisfied" (54%) or "more than satisfied" (7%) with their current income. Optometrists have a number of reasons for this, and here are just a few:

"I've only been out in practice for a few years," says Amber Hurley, OD. "I feel like I am making enough to live on, pay loans and save a little. No complaints."

• ***Family/life balance.*** "[It's a] great profession to make a substantial living, but not sacrifice time away from your family," says Brandon Mayes, OD, of Kid's Eye Site in Oklahoma City, Okla.

• ***Job satisfaction.*** "I am blessed to do what I do to help people, as well as live comfortably," says Richard Malara, OD, of Malara Eyecare & Eyewear Gallery, Baldwinsville, NY.

• ***Steady work, steady pay.*** "I've only been out in practice for a few years, and I feel like I am making enough to live on, pay loans and save a little," says Amber Hurley, OD, of Envision Eye Care, Cedar Bluff, Va. "No complaints—I know that I will continue to grow and increase my income as the years go."

• ***Fewer headaches.*** "Compared with other professions' hours, stress and responsibilities, [we] have it easier," says Neeraj Bindal, OD, of A Visual Affair in Arlington, Va. Indeed, optometry was found to be one of "15 High-Paying Jobs for People Who Don't Like Stress," according to an article that used data from the Bureau of Labor Statistics to rank "stress tolerance."[1]

Much to be Desired

Not all optometrists see eye to eye on income satisfaction, of course. More than 33% of ODs say they are "unsatisfied" with their current incomes. Meanwhile, the number of ODs who report they are "very unsatisfied" has decreased to fewer than 6%—compared to a high of 9% in the depths of the recent recession. Here are just a few of their reasons for dissatisfaction:

• ***Heavy student debt.*** "With all the debt you incur during studies and all the time you spend treating patients, the income is not enough," says Mark R. Quiñones, OD, of Texas Eye Health Consultants in Houston.

• ***Reduced insurance payments.*** "Reimbursement from insurers

Gender Disparity in OD Income

In optometry, there is a gender gap in income. Actually, it's more like a gulf than a gap. According to our survey results, male ODs earned an average of $174,408 in 2013 while female ODs averaged $109,892. That means men in optometry earned about 59% more than women in optometry!

But hold on. There's more to the story. Let's look closely at these numbers because they are indeed skewed.

Specifically, more younger female ODs and more older male ODs answered our survey. Because younger female ODs earn the least and older male ODs earn the most, we can attribute our survey response to skewing the average incomes for females and males.

To account for this, we can look at income by years in practice (which is a reasonable, though not exact, approximation for age), and the gender gap tends to narrow—although it it doesn't go away.

For instance, among optometrists with fewer than 10 years in practice, women (n=149) earned an average of $96,758 while men (n=121) averaged $124,859, or a difference of 29% in men's favor. Definitely not equal income but, as you would expect, the gap widens even further among the most experienced optometrists. Among ODs with more than 30 years in practice, women (n=9) had an average income of $141,213 while their male counterparts (n=100) averaged 46% more, with a mean of $206,643.

Definitive reasons why male ODs earn more than female ODs (even when adjusted for age/experience level) are beyond the scope of this report. Reduced income due to time off for maternity leave and child care undoubtedly account for some of this difference, but most certainly not all.

Still, the future looks promising for female ODs—optometry was recently ranked as one of the top US industries for women, according to IBISWorld, a market research firm.

Phillips J. Top US Industries for Women. IBISWorld website. Aug 7, 2014. Available at: www.ibisworld.com/media/2014/08/07/top-us-industries-women. Accessed Oct 24, 2014.

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—especially vision care plans—continues to decline," says Scott Krauchunas, OD, of Infocus Eyecare, Belmont, NH. "To generate more revenue, I need to see more patients to cover expenses."

Clark Weeks OD, of Winfield, Ala., reports the same problem of trying to break even despite ever-declining managed care reimbursement fees: "I work twice as hard as I used to, just to make a similar income."

• *Increased expenses*. "Based on cost of living/inflation, all of the concessions to insurance company fees and the continued expansion of managed care, it effectively has been like taking a gradual pay cut over the last 24 years of practice, while we continue to have more forced expenditures placed on us for things like EMR," says Tom Tritschler, OD, of Eye Health Partners in Murfreesboro, Tenn.

Increased expenses and decreased fees have amounted to a gradual pay cut, says Tom Tritschler, OD.

Still, most ODs are hopeful for better days to come. Just over half (51%) anticipate their incomes will increase in 2014, while 37% hope it will at least stay the same. Fewer than 7% predict their incomes will decrease.

Optometrists have all sorts of ideas to increase their income, such as reducing overhead, working more hours, expanding medical eye care services, providing specialty products and services, dropping insurance plans, bringing on an associate or opening an additional office.

For his part, Dr. Tritschler laughs in the face of adversity. His plan: "Working toward possible supplemental income as an underwear model, and starting a cattle and swine herd." ■

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7 Steps for Superb Staff Recruitment and Retention

Here's how to find the best new candidates while minimizing staff turnover.

By Bryan M. Rogoff, OD, MBA, CPHM

Hiring is really an ongoing process, so continue networking even when you don't have an opening in your office, says Bryan Rogoff, OD, MBA, CPHM (right).

As a manager, I was never more frustrated than when a great employee decided to move on from the organization. The blood, sweat and tears that I had spent recruiting and developing this employee felt wasted.

The cost of staff turnover is not just the simple price of posting a help wanted ad for a new staff member, but the development and training time of the new associate, as well as lost knowledge and lost productivity of the vacating associate, which adds unrecoverable expenses to your practice. In fact, "turning over" an employee can cost you as much as 150% of that worker's annual salary![1]

How can we find out what, if anything, went wrong and prevent this from happening with other employees?

Of course, I conducted exit interviews, which can provide valuable information. But then again, vacating staff members may not disclose *all* the reasons and details of why they're leaving your practice. If your practice is losing critical staff members rapidly, chances are other staff members are also in search of better opportunities.

So, before attempting to recruit new team members, conduct a full analysis of your retention rate and

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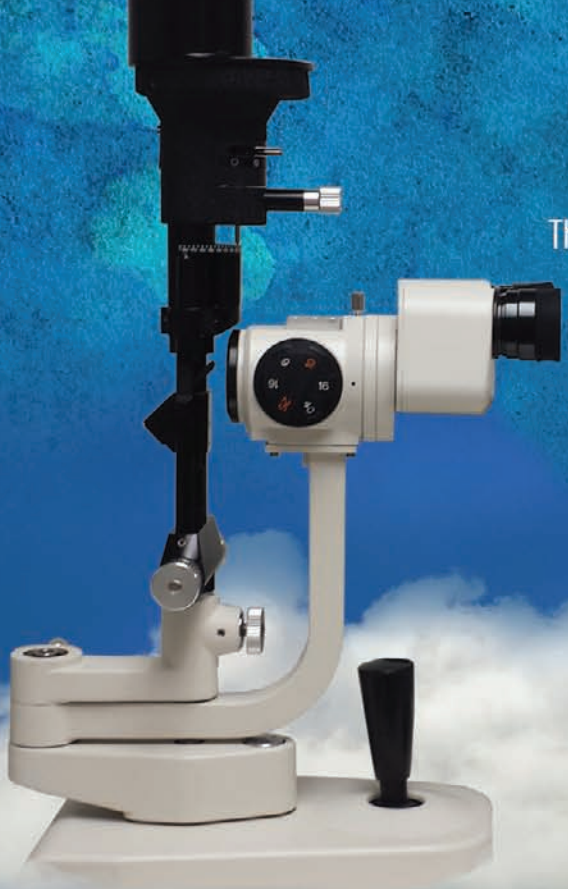

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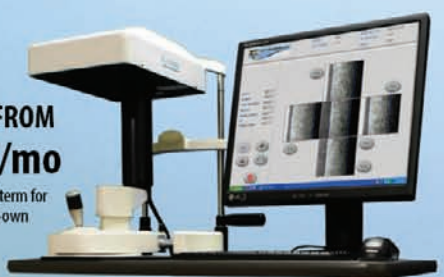

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identify opportunities of improvement. ("Acceptable" turnover is subjective. In my experience, a large corporation is happy with a turnover rate under 10%. But private practices should strive for less than 5%.) Plain and simple, if you do not have metrics of your retention, then you cannot make improvements. You then run the risk of newly hired employees leaving for similar reasons, which will cost your practice financially and even cause some patients to seek care elsewhere.

The cost of staff turnover is not just the price of a help wanted ad. In fact, "turning over" an employee can cost you as much as 150% of that worker's annual salary!

Having the right team is essential. (As a matter of fact, I prefer the term "team member" or "associate," instead of "employee.") It is your team that ensures patient satisfaction and education, optical sales, scheduling, day-to-day operations and overall practice productivity. With that in mind, here are seven solid steps to help improve your employee recruitment and retention.

1. Network to Hire

After filling certain positions, I'd become lax. So if I were caught by surprise with a resignation, I had no network of individuals to contact to discuss possible employment.

Now, when I consult for other practices, I stress the importance of networking. Hiring is really an ongoing process, and it should be a strategy of our everyday operations. So, even when your practice is fully staffed, you should always continue to network. Build rapport with vendors and other small business owners; when at events, take notice of individuals who you respect and trust.

Network not only within industry, but outside. People who are recruited outside of industry can bring completely fresh perspectives to an organization and practice. Some experience and skillsets outside the optical industry can be easily transferred. For example, a good restaurant manager understands specific costs and revenues associated with the business, yet also has the skills and qualities of a supervisor—such as managing people, providing good customer service and understanding profits and losses—which easily overlaps into the ophthalmic arena. Similarly, nursing assistants have a general knowledge of the human body and disease processes, and can easily transfer these to the role of an ophthalmic assistant with minimal training.

Once you meet such an individual, stay in touch and learn about what they are looking for professionally and personally. Even though your practice may not have a position or the budget to bring these individuals on board, an unpredictable circumstance may occur where you need to add or backfill a position.

2. Success Through Social Media

Social media has become a vital source of networking and recruiting these days. I've had great success finding candidates using the Internet—but also found there are certain sites that were counterproductive and wasted a lot of time. I've used free sites like Craigslist and pay-per-posting like ZipRecruiter.com, and found you often get what you pay for. That doesn't mean you may not have success with these posting sites. But, in my experience, lost time and productivity lead to lost revenues. So, it's important to be as time-efficient as possible.

LinkedIn, deemed the "World's Largest Professional Network," has become the website of choice by most hiring managers, and more than 70% of recruiters use it as their only source.[2] I've used LinkedIn to get connected with a number of certified ophthalmic technicians, eyeglass sales associates and office managers.

Facebook has also become a useful recruiting tool. Although posting opportunities on LinkedIn will likely double your applications, Facebook was the only social network to increase in job applications in 2013-2014.[2] To post an opening, you can create a Facebook Ad as easily as you'd submit a classified ad to your local newspaper. But Facebook also allows you to input specific keywords and demographics to target your ad. For example, if I'm looking for an individual in my area who has optical experience, I'd type in such keywords as "optical," "eyeglasses," "sales," "Washington DC," etc. Facebook then displays the ad only to individuals who might have those keywords in their profile. Another way is to post an opening directly on your practice's Facebook page.

These sites are vital tools when filling special voids in your practice where you can view specific educational background, overall experience and endorsements from coworkers right from your computer or mobile device.

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Get Your Staff in Sync

3. Building a Team Takes a Team

Great talent is hard to come by, so be prepared to modify the job description if you're not attracting the right applicants. Certain candidates may not have the laundry list of education and experience that you desire, but they may show potential with a basic skillset. Some specific skills can be learned through patience and good training, especially with talented individuals. In other words, you can teach optics and selling, but you can't teach good intuition or the ability to interpret customer needs.

Be objective about how this employee would be a significant investment—or worse, a significant risk. Due diligence is always necessary when hiring new employees, and this is where a reference check could add value to your decision. A reference check could reveal certain inadequacies or a background history that might not come up during the interview process. (I use the word "could" because reference checks shouldn't be the final decision when hiring. Many times, I've trusted my "gut instincts" even when a candidate's reference checks were not perfect.)

To find the most qualified, capable candidate, and one who will fit seamlessly with the rest of your team, get your associates involved with the selection process.

If you want to find the most qualified, capable candidate with the most potential, and also one who will fit seamlessly with the rest of your team, get your associates involved with the selection process. Analyze traits among your successful staff members and see what's common—not only which traits make them essential team members, but also which ones match your management style. Long-term employees not only need to be qualified individuals, but also must possess similar traits as current team members in order to build camaraderie. Whether it is customer service or staff management, your current staff will have to work with the new associate, and although personality conflicts are extremely difficult to avoid, this process can help reduce possible tension. Key team members can also reveal different perspectives and opportunities that you, as a supervisor, may not see.

In addition, consider a criminal background check, particularly for team members who will be managers or in charge of money. Be aware that criminal background checks can be time consuming and costly. Some instances to consider a criminal background check: when a candidate's resume has significant gaps in employment; when an individual is overly anxious to start a new position; or if a candidate avoids eye contact when asked about past work experience. Again, listen to your gut.

For your part, always be honest and upfront with candidates about why the position is vacant and discuss how they can be a solution for certain challenges.

In addition to the traditional, sit-down interview, create a half-day or all-day "itinerary" of your office in which the best candidates meet with different team members. With the involvement of your associates, demonstrate a "typical day" of the responsibilities of the position while, at each stage of the process, have your staff evaluate the candidate's reactions, interactions and applicability of their experience. Later, discuss as a team which candidate seems to be the best fit.

4. Set Up for Success

After years of improving on approaches to onboarding and training, I found it is important to prepare your practice and team to welcome new members, and the easiest way to set up them for success is thorough development. (The concept of development encompasses more than just employee training. To offer an extreme example: a dog can be *trained*, but an individual who can make independent decisions and contributions should be *developed*.)

This will be your opportunity to mesh the common values of the new team member with your practice. By giving them the tools and proper training to do their job well, you are also demonstrating your support for them to succeed. For example, if you've just hired a new optical sales associate, be sure to provide a manual of your office operations, procedures and policies; train them on your point-of-service computer system; have a working pupillometer; show them where extra supplies are located in the office, and how they can order supplies if they're running low. Such suggestions may seem intuitive, but these details can be overlooked when the associate's first day is approaching. Empowering the employee from day one will boost their confidence.

Also, just as you involved your staff to be part of the hiring process, use them to develop new associates. The top-down approach can

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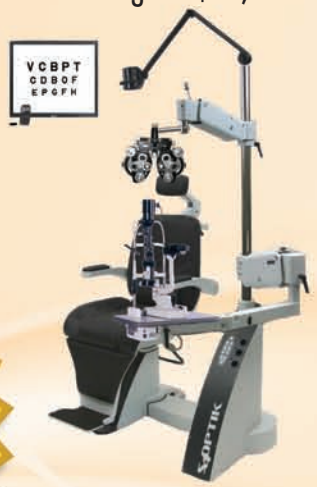

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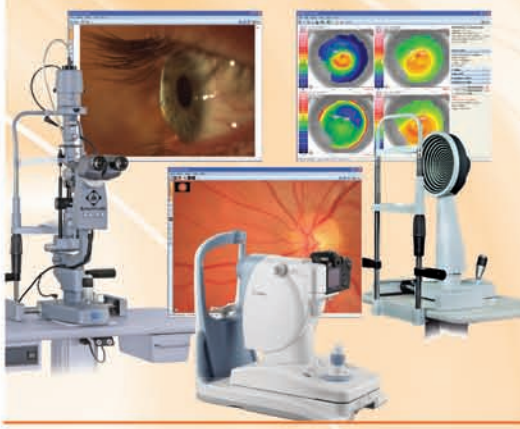

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be intimidating for new hires and may not be as welcoming as using an experienced, long-term associate who will be working with them side-by-side every day. This fosters camaraderie and allows easy access for questions of daily operations.

Have new associates arrive for basic development before your practice is open to give you and other team members the opportunity for undivided and uninterrupted time. Starting a new team member during regular office hours can be overwhelming for your team as they are trying to ensure smooth operations of your practice.

5. Learn About Your Team Members

Small practices have a great advantage of creating a work environment that feels more homey and family-like. Dedicated weekly meetings allow associates to discuss recent issues and accomplishments. This input demonstrates associates' concern to do their job well and helps them express their frustrations.

Remember to listen and not have defensive reactions. This gives you and other senior staff an opportunity to make fixes before they escalate into something larger that can lead to turnover.

The reason why you have an amazing staff is because of their amazing skillsets and talents. Their assets that promote and ensure your practice's success, and using them to their full potential leads to more job satisfaction. I found focusing on associates' career goals and making one-on-one appointments every six months allowed me to review opportunities and learn more about them and their ambitions. You may be surprised to find that their experience and skills can be used in other capacities outside their current job description.

Nothing is more gratifying or powerful than saying "Thank you!" Thanking your associates publicly and privately shows your appreciation of the value they provide.

6. Customize Your Benefits and Create Opportunity

As you learn more about your employees, discovering their personal needs in terms of benefits can lead to longer employee retention.

Big corporations have centralized benefit packages that usually have little room for modification, so employees can become frustrated with "benefits" that add little or no value to their lives. Small practices, on the other hand, can match benefits to best fit the staff. This doesn't mean to keep adding benefits, but creating a package that meets the needs of *your* team. Not every team member may need a health care or retirement plan, but they may use other benefits such as health club membership or day care. Or, perhaps a flexible schedule allows certain associates to work from home a few hours a week.

Creating employee satisfaction is crucial for retention, so customizing your benefits can be a critical tool to keep your practice's work environment competitive. Additionally, it allows employees to balance their personal and professional lives more efficiently.

7. Recognize and Reward

Acknowledging hard work speaks more loudly than recognizing mistakes and shortcomings.

Employees want to feel rewarded for performing a job well—the key word is not "rewarded," but "feel." Validating and recognizing an employee for their efforts goes a long way and is critical for retention.

Not all rewards have to be monetary raises and bonuses, either. Small practices have a greater ability to reward additional days off and gifts that provide a personal touch than larger organizations.

Nothing is more gratifying or powerful than saying, "Thank you!"[3] Thanking your associates publicly and privately shows your appreciation of the value they provide. Personalizing your "thank you" with a card or a note in their paycheck demonstrates a genuine regard for their service and not just a simple habit.

With many Americans spending more time at work than at home, making your practice environment fun, social and comfortable creates a place where your team wants to work. ■

Dr. Rogoff is a private practice and industry consultant specializing in best practices. He is also the legislative chairperson for the Maryland Optometric Association, and a consultant for the FDA's Ophthalmic Devices Panel of the Medical Devices Advisory Committee. Email: bmrogoff@comcast.net.

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Advertorial

Delivering Exceptional Disinfection in only 4 hours with a Peroxide

The last 10 years have seen dramatic changes in contact lens materials and multipurpose solutions—many with the ultimate goal of making the lenses more comfortable and improving the patient's overall lens wearing experience. Despite obvious progress on multiple fronts, there's been a surprising lack of innovation in the hydrogen peroxide category—until now.

By Marjorie J. Rah, O.D., Ph.D.

PeroxiClear™ 3% hydrogen peroxide solution utilizes Triple-Moist Technology™—a combination of three different moisturizing agents to attract, spread and retain moisture on the surface of the lens. One of these ingredients, carbamide, serves a dual purpose. A natural moisturizing factor, carbamide not only helps prevent dehydration, but also has a second unique role as a platinum modulating compound.

One-step hydrogen peroxide contact lens disinfecting systems utilize a platinum coated disk to initiate the neutralization of hydrogen peroxide. This reaction results in initiation of neutralization as soon as the platinum sites on the neutralizing disk come into contact with the hydrogen peroxide. The addition of carbamide to the system can effectively slow the initial neutralization, in particular during the first 60 minutes of exposure, allowing for a faster overall disinfection rate, while still maintaining safe residual peroxide levels.[1,2] Disinfection efficacy with a peroxide system is directly related to the amount of peroxide that the microorganisms are exposed to over time. Due to the slower initial neutralization, PeroxiClear™ has a significantly higher total peroxide exposure in only four hours compared to Clear Care after six hours (Figure 1). The result is very high kill rates of microorganisms while still allowing for neutralization to occur in only four hours. In fact, the residual peroxide level of PeroxiClear™ after only four hours of soaking is 65ppm[3] as compared to Clear Care at 60ppm[4] that requires six hours of neutralization (Figure 2). At these residual peroxide levels, for general ophthalmic applications, a difference of 5ppm of residual hydrogen peroxide is not clinically significant.[5]

In fact, in a multi-center study that enrolled 297 contact lens wearing patients who habitually used Clear Care as their contact lens solution, patients reported that PeroxiClear™ delivered superior comfort throughout the wearing experience vs their habitual peroxide solution.[6] By a margin of 5:1, patients not only reported superior overall comfort with PeroxiClear™ compared to their habitual peroxide solution, but the same ratio held true for comfort upon insertion and comfort at the end of the day.[6]

When using PeroxiClear™ solution with Triple-Moist Technology™, whether it is when they first put their contacts lenses on or when they finally take them off, PeroxiClear™ delivers superior comfort[6] compared to Clear Care. ■

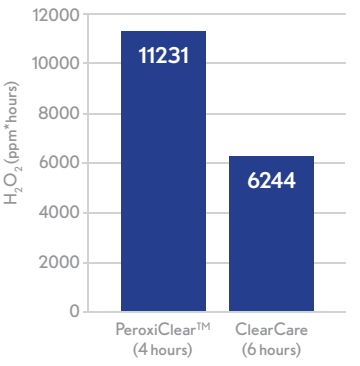

Figure 1. *Total peroxide exposure during the manufacturers' recommended disinfecting time for PeroxiClear™ (4 hours) and Clear Care (6 hours).*[7]

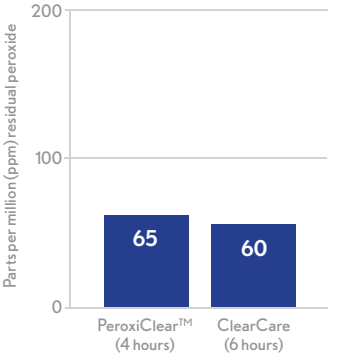

Figure 2. *Hydrogen peroxide residual concentrations following neutralization for PeroxiClear™ (4 hours) and Clear Care (6 hours).*[3,4]

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Is Paraoptometric Certification Right for Your Practice?

Could your practice gain patients and respect with certified paraoptometric technicians? Or, is certification of techs even worth it?

By Cheryl G. Murphy, OD, Contributing Editor

Are your optometric technicians certified? If not, should they be?

Many private practitioners—and many techs themselves—say that paraoptometric certification offers a lot of pluses: it improves patient care, raises patients' respect for your practice, bolsters employee loyalty and reduces turnover.

In many practices, optometric technicians have a wide range of responsibilities, including pretesting, visual field testing, retinal photography and imaging, frame and lens selection, adjustments, contact lens insertion and removal instruction, front office management and the triaging of eye emergencies. With all this on their shoulders, shouldn't they have some sort of formal endorsement or qualification?

On the other hand, some practitioners ask: If you've done the in-house training yourself, why jump through hoops for a designation that adds little more than a stamp of approval? And, why encourage or even subsidize the expense to train a tech, who may very well take that experience to a better-paying job at another practice?

Let's look at both sides of this often overlooked, but important, issue.

Optometrist Summy To (right) only recently hired a doctor's assistant, Greg McCauley, to provide continuity of care. But she hasn't yet decided if certification is necessary.

Alan Bishop, OD, (left) stands behind certification of his staff (left to right): Kristin Kiewit, CPO; Alex Carpenter, OD, a CPO-tech-turned-optometrist; and Chantay Kittles, a tech currently preparing to take her CPO test.

Practicing Without 'Paras'

Despite the availability of paraoptometric certification, some optometrists have found that the extensive in-house training that they put newly hired technicians and doctor's assistants through is enough.

Optometrist Craig Miller of Eye Columbus in Columbus, Ohio, has non-certified optometric assistants as well as opticians scribe for him and perform pretesting. He says that most new techs in each of his two practices typically start with scribing before moving into pre-exam mode and that none of his staff is currently paraoptometric certified.

Why not have techs obtain certification?

"Most staff do not feel that it is a necessary step in order to be productive in their field [and that] the 'on-the-job' training that is provided to them combined with professional experience are the keys [to being successful and feeling competent]," Dr. Miller says.

Other optometrists, like Summy To, OD, of Myoptic Optometry in Portland, Ore., have had opticians or the doctors themselves do pretesting, and only recently have found it necessary to add any type of doctor's assistant. But, she has yet to require the optometric assistant to become certified.

"As we got busier, the opticians were handling more tasks at once, and I was concerned that we could no longer provide the smooth continuity of care our patients deserve while keeping my team focused," Dr. To says. "Now I have hired a doctor's assistant to check in patients, answer any questions patients may have and pretest. Afterwards, the doctor's assistant follows through [with the patients' continuity of care] by introducing them to opticians, then checking them out and executing any of the doctor's orders, like calling in medical prescriptions or ordering trial contacts."

Dr. To says that adding the position of a doctor's assistant to her

Get Your Staff in Sync

The Basics of Certification

Doctor's assistant Greg McCauley, here taking digital retinal photos on a patient, helps in the practice of optometrist Summy To. Taking an assistant on board allows her to focus on patient care without being pulled in several directions at once, Dr. To says.

According to the AOA's Commission on Paraoptometric Certification (CPC), your practice is not "100% certified" unless your optometrists, opticians, optometric techs and assistants all have the proper credentials.

"Certification focuses specifically on the individual and is an indication of current proficiency in a specialized field," says Sharon Alderson, administrator of the CPC. The key words here are "current proficiency" because certified paraoptometrics not only have to pass a test to demonstrate a competent level of knowledge and understanding at each level of certification, they also have to keep up with continuing education that requires them to take a certain number of credit hours every three years in order to keep their certification valid (18 CE hours for those certified as CPO, CPOA and CPOT and 9 CE hours for CPOC.)

The continuing education aspect of certification seems to be one of the advantages to entering the ranks of official paraoptometric certification because it enables those certified to maintain their current knowledge base and gives them opportunities to expand it.

The CPC says there are about 6,000 individuals currently certified among the four types of paraoptometric certification. Three out of the four types progressively build upon each other: certified paraoptometric (CPO) is the entry level, certified paraoptometric assistant (CPOA) is the next or intermediate level and certified paraoptometric technician (CPOT) is the most advanced level. Certified paraoptometric coder (CPOC), the fourth type of certification, stands independent from the rest because it doesn't require certification at any other level prior to achieve it. However, there is a minimum of two years' experience in the field of medical billing and coding required in order to apply to take the CPOC exam.

Achieving certification, even at the entry level (CPO), may be challenging for some. To pass the examination, the candidate has to demonstrate a vast understanding of optometric principles and knowledge of instrumentation, anatomy, optics, basic pharmacology and even aspects of practice management. The CPO test consists of 100 multiple-choice questions and there are study bundles available for purchase through the AOA website to help candidates prepare for the test as well as the tests at other levels.

Testing at the most advanced level of paraoptometric certification (CPOT) will change beginning November 2014. The exam traditionally consisted of two parts: a 225-question multiple-choice exam and a hands-on practical. But starting this month, the hands-on practical has been replaced with a clinical exam. Candidates must successfully complete both parts of the CPOT exam in order to earn the CPOT title.

Different Types of Paraoptometric Certification

The AOA's four certified programs for optometric staff accredited by the National Commission for Certifying Agencies include:

• **Certified Paraoptometric (CPO):** entry level

Requirements: Minimum of a high school diploma or equivalent AND minimum of six months mentored experience.

Fee: $265

• **Certified Paraoptometric Assistant (CPOA)**: intermediate level.

Requirements: Minimum of six months additional employment in the eye care field as a Certified Paraoptometric (CPO); or be a graduate or student currently enrolled the last semester of study of a CPC-approved optometric assistant program; or have five years or more work experience in the eye care field and receive approval from the CPC administrator to bypass the CPO exam. The employer must attest to this experience by completing the CPOA Reference Form.

*Fee: $285, or $215 for students **

• **Certified Paraoptometric Technician (CPOT):** advanced level.

Requirements: Minimum of six months additional employment in the eye care field as a Certified Paraoptometric Assistant (CPOA); or be a graduate or student currently enrolled in the last semester of study of an Accreditation Council on Optometric Education (ACOE) approved optometric technician program.

*Fee: $285 or $215 for students **

• **Certified Paraoptometric Coder (CPOC):** speciality.

Requirements: Minimum of a high school diploma or equivalent AND minimum of two years' experience in the medical coding and billing field.

Fee: $265

Application deadlines, details, exam dates and testing center locations can be found on the AOA website (www.aoa.org/paraoptometrics/certification/apply?sso=y). Handbooks and study bundles for each type of test are available for purchase through the AOA marketplace online.

** Student: an applicant who is currently enrolled or has graduated within the past three years from either a CPC- or ACOE-approved program. Documentation required.*

practice has helped tremendously because it has "led to less effort on the doctor's part to find an available body, and more time for each person to devote their undivided attention to whomever they are helping at the time."

Because the doctor's assistant only recently came on board, Dr. To hasn't yet decided whether he needs to be certified.

Upside to Certification

Optometrist Alan Bishop of Easton Eye Care in Easton, Md., has seen firsthand the advantages of his employees achieving certification. One instance was in how well his technicians properly handled the triaging of a patient who called their office on a Saturday with complaints that indicated a retinal detachment.

"[The patient] was concerned about leaving work and coming to the office and also that we did not accept his insurance," says Dr. Bishop, "[but] our technicians assisted with the triage and explained to the patient that he should not hesitate and should be seen right away. We fit the patient in and he indeed did have a retinal detachment. One of our technicians assisted with contacting a local retinal specialist who immediately performed treatment to save the patient's vision. If it weren't for our educated technicians being able to know and understand the urgency and symptoms of a retinal detachment, this patient may not have experienced such efficient and appropriate care."

There are currently three certified paraoptometric techs on Dr. Bishop's staff: two CPOs and one CPOA. "It's important that we have staff with a proven skill set," says Dr. Bishop. "Being able to have certified staff hopefully shows our patients that we are committed to providing them the best care, the best service and the best experience they can have. Our staff considers what they do a career, not a job."

Though it may be hard to find certified paraoptometric technicians to hire, Dr. Bishop suggests optometrists should not let that discourage them from striving to have their office become 100% certified.

"Paraoptometrics are not in abundance in our area, therefore we've never hired someone already certified," he says. "We've brought staff into our office with exceptional service skills and trained them onsite. Once ready, they've registered for certification and passed."

Although he did not pay for their initial fee to become certified, Dr. Bishop says "they were provided an immediate wage increase upon passing and my practice pays for any subsequent exams." His certified techs cover their own renewal fees involved with keeping their certification valid, but he does pay for all of their continuing education at Vision Expo East and "the practice has employees registered as associate members of the AOA through myself, therefore entitling them to take up to six CE credits yearly."

Dr. Bishop encourages other ODs to adopt paraoptometric certification into their own practices. "Certification will emphasize professionalism, earn patient trust and enhance an employee's own self-image and confidence. I personally feel certification is also a weapon against turnover. Some may think, 'If I train them, what if they leave?' But I subscribe to the idea, 'If I train them, what if they stay?'"

To prove his point, Dr. Bishop relates that one of his former

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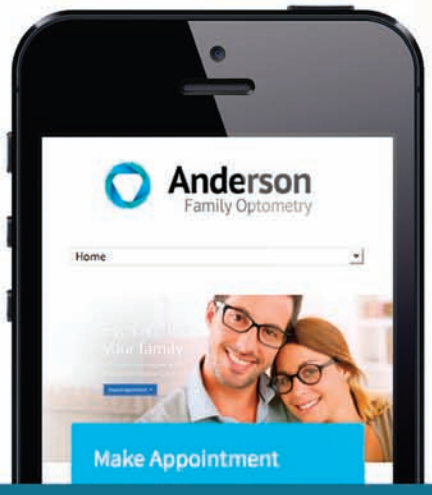

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Get Your Staff in Sync

Tami Franklin, CPOT, says certification promotes better patient care. Here, she helps test candidates prepare for the CPOT exam at a CE review class at SECO.

CPO-certified techs is now back on staff—only this time as an optometrist who has since graduated from Salus University.

A Para and an Advocate

Tamara Franklin, CPOT, Chair of the AOA's Commission for Paraoptometric Certification (CPC), also encourages optometrists to help staff attain paraoptometric certification—like she did herself.

"Paraoptometric certification is a measure that proves that optometric staff have attained a standard level of knowledge to provide patient care," Mrs. Franklin says. Also, certification "requires them to continue to expand on their competency, which is an integral part of providing a higher level of patient care."

In addition to serving as chair of the CPC, Mrs. Franklin is also the office administrator at Alliance Vision Source in Alliance, Neb. She says certification promotes better patient care not only through CE, but also through camaraderie. "Certification creates an environment of learning, bringing [with it] higher levels of patient care as a team. My optometrist and I were always a team, with a philosophy of bringing the best patient care to all our patients, no matter what their needs were," she says. "After I attained my CPOT, I used it not only for the medical side of the practice, but also for continued education in low vision and vision therapy."

Optometrists play a pivotal role in helping technicians and assistants realize the benefits that formal certification can bring, Mrs. Franklin says. "Often, the optometrist doesn't realize how influential they can be. Seeking paraoptometric certification should be important to all optometric staff, as well as all optometric physicians," she says. "I would encourage all optometrists to have a program of continuing education for their staff, which includes a path for those employees to follow to the CPOT level, if they desire."

Paraoptometric certification is not just good patient care, Mrs. Franklin suggests. It's also good business. "In our changing health care world, I feel paraoptometric certification is more important now than ever before," she says. ■

6 Tips for Effective Tech Delegation

A good technician can save you time, increase revenue, accelerate your schedule and elevate your patients' perceptions of your practice. **By Kara Gibbs, OD**

Technician delegation is an essential part of my practice. Delegation has added to my bottom line, decreased my per patient workload and has made practicing more enjoyable. Prior to opening my own practice, I worked at several ophthalmology clinics and got to experience the benefits of delegating. This was something that I wanted to carry forward into my own practice.

When I opened cold in February 2012, I started with one employee who had no optical experience. I had just a handful of patients initially, so I did the entire exam from start to finish, including the materials selection and measurements. My appointment slots were 45 minutes.

Over the years, my practice has grown to include three employees. Six months into the practice, I added an optician. One year in, I hired a front desk person who was also my technician. About 16 months in, I decided it was time to have a dedicated technician and a dedicated front desk employee. About nine months ago, I started offering vision therapy. About three months ago, my technician also took on the role of vision therapist.

You must interpret the patient's data, but you don't need to collect it. That's just one reason for delegation, says optometrist Kara Gibbs. Her technician, Renee Haight, performs pretesting as well as vision therapy.

My appointment slots are now 15 minutes, with a few appointments double booked.

Revenue per patient can potentially be hundreds of dollars, so adding additional staff is a great investment because it allows you to increase your patient base. With my current staff, I now have the opportunity to see at least twice as many patients as I did before.

Also, your job as an optometrist is to interpret data, not to collect it. Being able to assess the data as a whole has made me a more effective clinician. It's wonderful to simply review the technician's testing results before I even walk into the exam room—I can really focus my attention on the problem at hand. It allows me some time to think about possible diagnoses. If I need additional clarification from the patient on their complaint, I have the time to ask. If I want additional testing

done, we perform it that day or schedule the patient to come back for a follow-up.

Technicians are becoming standard practice in any health care setting. Primary care physicians, specialists and even dentists rely on technicians in some form. Patients have come to accept and expect to have an assistant/technician get them ready to see the doctor. Having a technician may improve patients' perception of your practice and help you adapt to a medical model. I have yet to receive a complaint about a patient seeing the technician first.

How can you get started with a technician, or expand their responsibilities?

1. Hire the Right Personality

This is the most essential tip. The technician may spend as much time with the patient as you. Your technician is a direct representative of your practice and sets the tone for the exam. It is important that they be friendly and professional at all times.

Your technician must be comfortable communicating with your patients. Don't hire someone who is not comfortable with children if you have a pediatric practice. Also, there will be times when more than one patient is waiting for the technician. The technician must be able to multitask and work quickly. (*See "You Need a Renee!" above.*)

2. Decide What to Delegate

Be honest with yourself: you are experienced with testing, but almost anyone can be trained to perform these tests and record the results. It's the interpretation of the results in which our expertise resides. Instead of collecting and inputting data, you can spend more quality time with patients.

You Need a Renee!

My technician/vision therapist Renee is an integral part of my practice. She has improved our patient flow, which allows me to see more patients more effectively. Renee performs many tests—from documenting the patient's history to taking retinal photos—which I used to think I had to do myself.

She is also responsible for several other tasks, such as keeping the exam room supplies stocked, opening and closing the exam lane, cleaning the equipment before each patient, and communicating with me after each vision therapy session.

For example, my technician Renee is trained to dilate patients for comprehensive exams and certain follow-ups. She knows not to dilate patients with elevated intraocular pressure or those with specific eye conditions. If she is ever unsure, she first confirms with me.

So, decide which essential items you must do or want to perform, and what you can delegate. (*See "Tasks and Tests You Can Delegate," page 44.*) Check your state laws to make sure that these tests may be delegated to a technician.

3. Consider Your Available Space

Your technician will need a private area to perform pretesting. This could be done in the exam room or in a separate work-up area. For instance, our office has two exam rooms. I use one room to examine patients and Renee uses the other for pretesting and vision therapy sessions. The second exam room also contains an automated perimeter and fundus camera.

Specifically, after Renee is done pretesting, she escorts the patient into the primary exam room. She lets me know the patient is ready and I review the patient's chart before entering the exam room. I do a few entrance tests and refract before dilation has set in. I enter the testing information from the EHR system, and then perform the dilated portion of the exam.

Meanwhile, Renee is pretesting the next patient.

4. Train Properly

The technician must feel comfortable with their duties or patients will pick up on nervousness. Have the technician shadow you until they are comfortable with the workflow. Then watch as they perform the tests and input the results. They may be more comfortable first practicing on you or a staff member before moving on to patients. Make sure to stress accuracy first and then work on speed.

Documentation instruction is just as important as performing the test. If you use an EHR system, the technician must know where to put the test results. Technicians must also be aware of any testing results outside of normal that require your attention or that would trigger additional testing.

Technicians must know what testing to perform for each type

of encounter and over each age range. You'll want different testing performed on a one-year-old vs. a 45-year-old. You'll want different testing for a new patient comprehensive exam vs. an "IOP check."

Another thing to stress to the technician is that they are not to give medical advice or provide testing results to the patient. If a patient asks a medical question, have them say, "That's something we can ask the doctor." Then have the technician make a note for you to address the question during the exam. The technician needs to be well versed in your office policies and fees, as this is where many patients will ask those types of questions.

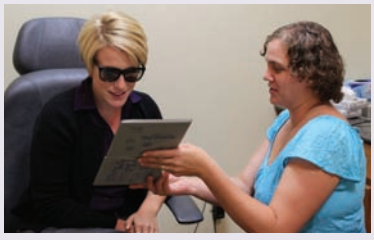
At the end of the day, it is a good idea to touch base with your technician. Talk about how patient flow went, if they have any questions about testing, etc.

5. Be Ready to Adjust Your Schedule

It will take some time until the technician gets up to speed. You can simply decrease your patient volume. Another option is to keep your volume the same and you can see patients simultaneously, as needed, if your workspace allows. Although this can be frustrating, especially if you have a busy schedule, it is necessary. Most patients are very accommodating if you tell them that you are training. I found that, after a few months, my technician was faster than I am.

Of course, I'd love my schedule to be fully booked, but there are still some slow days. I have my staff make the best of their time when they are not busy with patients. With stagnant or decreased insurance reimbursements, I make sure they have something useful to do. They can follow up on reports, work on billing, market the practice, clean the office, get together for staff meetings, etc.

Tasks and Tests You Can Delegate



- Patient and family history
- Medications and allergies
- Vitals
- Visual acuities
- Color vision
- Stereopsis
- Confrontations
- Pupils
- IOP
- Neutralize current Rx
- Instillation of dilating agents
- Extraocular muscle motility
- Automated testing, such as visual fields and autorefraction
- Retinal photography
- Contact lens training
- Vision therapy
- Developmental testing

6. Invest in Staff Education

As new technology becomes available or you add additional services to your practice, your technician will need further training. My practice has added vision therapy services over the last year. I started out performing the sensorimotor exam, developmental testing and vision therapy sessions myself. My technician is now training as a vision therapist and she also performs the developmental testing and some elements of the sensorimotor exams. Getting Renee comfortable to perform vision therapy sessions has required extensive training.

The right person will be excited about the increased responsibility. With vision therapy sessions lasting about 40 minutes, this is a huge time saver for me while still increasing revenues.

You should make it clear that ongoing education is important as well. I show her any beneficial journal articles I come across. Furthermore, our office staff attends multiple continuing education conferences through out the year. Employees view this as a job perk and are excited to attend. The practice covers the cost of attendance, travel, meals and their time.

Now that you delegate more, you must decide what to do with your extra time. This is the easiest and the most enjoyable step. Use your time to see additional patients or spend more quality time with each patient to make individualized recommendations. Other options are working on administrative tasks, marketing your practice or simply scheduling more personal time away from the office.

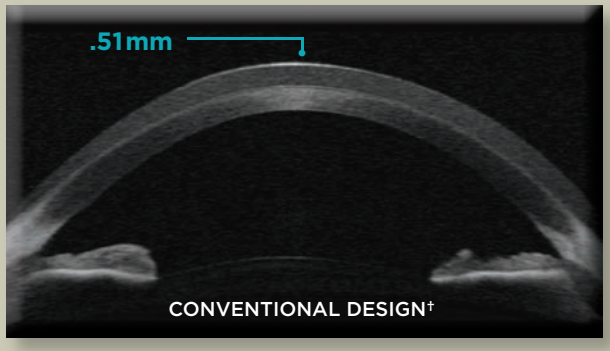
Remember, the doctor's time is the most valuable in the practice. Having a well trained and personable technician will save you time, add opportunity for increased revenue, elevate patients' perceptions of your practice, decrease your workload and improve your professional outlook. ■

Dr. Gibbs is in solo private practice in Jamestown, NY.

Two approaches to treating irregular corneas with custom soft lenses.

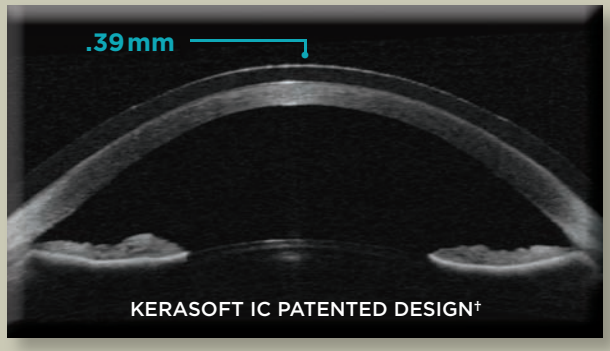
In its time

Thickness of material



In its prime

Anterior aspheric optics



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HR Headaches to Avoid

You do everything you can to keep your employees happy, but is your practice compliant with all current employment laws? **By Joe DeLoach, OD**

A successful colleague of mine once proposed that his optometry practice would be nirvana if he could make it "employee-less." While some days we all may agree, the concept is not realistic and perhaps a bit too cynical. The old adage, "Employees will make or break you," is far more accurate.

Competent, productive employees are an essential element of a successful practice. In America's litigious society, where employee vs. employer lawsuits abound, keeping your staff informed, motivated and happy is vital. In human resource management, the concept that "rules are made to protect the innocent" is gold. So, the federal and state laws regulating HR almost always work in favor of the employee.

The most common lawsuits brought against employers include hiring discrimination, failure to pay for overtime, harassment, discrimination in decisions for pay increases or benefits, retaliation against the employee, whistleblower actions against employers, failure to provide disability accommodations, unfair termination and defamation following termination. In 2013, the two most common employee lawsuits were retaliation and Fair Labor Standards Act (FLSA) violations.

It would be nice to just be a doctor and not worry about rules and laws, but that is a fantasy. Let's review some of the most common employee "headaches."

1. State Employment Laws

More than 15 federal statutes and countless state laws regulate your relationship with your employees. In all, tens of thousands of pages of legal jargon define proper employer behavior and employee benefits (better stated as employee advantages). Potential pitfalls abound. You surely know some of them, like discrimination and harassment, but there are many more that can pose equally serious consequences in the event of noncompliance.

Are you aware of your state's laws regarding employee benefits, surveillance, smoking, obtaining credit, criminal arrest or conviction reports, firearms in the workplace, drug testing, mandatory leave of absence for jury duty, time to vote, military leave, mental health leave or pregnancy leave—just to name a few? If not, you need to research those areas or get assistance from a compliance company or HR attorney. Not following any one of these laws can cost you a great deal of money and damage your reputation.

2. Fair Labor Standards Act (FLSA)

The Department of Labor (DOL) cites the FLSA as the most abused employee law in the United States. The main purpose of the FLSA is to make sure employees are paid properly for every hour they work regular time and especially overtime. It is an extensive piece of legislation, but the part DOL says is "abused" is the way employees are classified—either as salaried or hourly wage earners. To qualify as an exempt or salaried employee, the position must pass three rigid tests—the Salary Level Test, Salary Basis Test and the Duties Test. Generally speaking, executive, administrative, professional, outside sales employees and some computer workers who pass specific occupation-related tests and make no less than $455 per week may be exempt from overtime pay.[1]

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Check the Department of Labor's website for specifics on the tests for each occupation.

We can make it simple and state that it is very rare for any employee of a doctor's office, including your office manager, to qualify for a salaried exemption. The Office of the Inspector General (OIG) has placed this issue in its 2014 Work Plan, along with other national concerns like immigration, drug control, crime in the streets and health care fraud.

The OIG has also teamed with the American Bar Association in an openly designated "sue your employer" program to find and help employees improperly paid on a salaried basis. The program, called "Bridge to Justice," can be found on Facebook and billboards all across the country. Failure to comply with the FLSA cost one of your Texas colleagues $108,000. This is not a law to be taken lightly.

3. Occupational Safety and Health Administration (OSHA), Centers for Disease Control (CDC)

Federal law requires you to provide a safe working environment for your employees and infection control for your employees and patients. Compliance with OSHA and CDC standards requires a written Hazard Manual and documented training of your staff. OSHA deals with safety in the workplace and how you deal with hazardous chemicals (Windex is a hazardous chemical to OSHA!). The CDC is concerned with infection control—how you dispose of products that have touched your patient or their eyes, how you disinfect your office, how you handle employees or patients who present with potentially infectious diseases. No health care provider is exempt from OSHA and CDC regulations, optometrists included.

Optometrists have felt the sting of OSHA as their offices were evacuated and padlocked until they demonstrated compliance. As a side note, compliance with these two laws is a requirement for your participation in vision care insurance providers like VSP and EyeMed, among others.

4. Equal Employment Opportunity Commission (EEOC)

Discrimination in the workplace is prohibited by a collection of state and federal laws enforced by the Equal Employment Opportunity Commission (EEOC). Doctors are familiar with standard discrimination law under Title VII of the Civil Rights Act of 1964—no discrimination based on race, color, religion, sex or national origin. The Age Discrimination in Employment Act (ADEA) protects workers over 40 years old from discrimination in the workplace based on age. Other laws covered under the EEOC include the Pregnancy Discrimination Act (PDA) and the Equal Pay Act of 1963 (equal pay for men and women in the same workplace).

The Americans with Disabilities Act (ADA) applies to any employer with 15 or more employees (combination of part time or full time). The details of disability determination are beyond the scope of this article. If you are confronted with an employee disability issue, you should likely consult an HR attorney.

Recent legislation creates new sweeping changes in standards for disability determination for pregnancy and obesity, designating both as disabilities under this Act. The obesity law is poorly researched and written, and potentially very damaging to employers. Unfortunately, it is based on an employee's body mass index, a known flawed measure of a patient's health status in relation to their weight. This measurement can be used to make an employer provide special accommodations to an employee that may or may not be valid.

Little Headaches Most Employers Don't Know

A little problem can turn in to a monster if you aren't aware of it. Here are some pitfalls that come with pricey consequences:

- **New-hire-reporting portals.** One "little thing" that can cost you $25 per day for noncompliance is failure to report all your employees to the state new-hire-reporting portal. If your HR or compliance consultant does not provide you with this information, you can usually find the reporting website on the Internet.
- **Failure to display employee posters.** Another "little thing" with a noncompliance fine of $7,500 is failure to put up the correct employee posters in your office. Do not fall prey to expensive "poster companies," their misinformation and their hard-sell tactics. Visit www.dol.gov/elaws/posters.htm, answer a few quick questions, and download your state-specific, required notifications entirely free. Laminate them for use and replace them yearly for potential changes in the law. "Free" wins every time.
- **Disability insurance in Hawaii.** Hawaii is totally awesome, right? Well, not concerning disability insurance. Hawaii law requires employers to pay up to half the cost of a state disability program covering all employees. A few other states have similar laws.
- **Paid time off to vote.** Some states impose fines if you do provide paid time off for employees to vote. In Arkansas, for example, you can be fined for not providing time for your employee to breastfeed. California just passed incredibly lenient laws related to sick pay (AB1522–Chapter 317, signed by the governor September 10, 2014). Just more reminders that understanding state law is imperative to avoid HR headaches.

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These new laws, like most employment law, do not work in favor of you as the employer. Significant late night reading material on employee disability rights can be found at www.ada.gov.

These discrimination laws are written with a very broad stroke, and are also very liberally interpreted in court. There are many state regulations related to criminal history, arrest records, credit history, smoking and a host of other issues that an employer must also be aware of related to unfair discrimination. New EEOC rulings even protect employees from discrimination based on religious belief, customs and attire; such provisions cover body painting, tattoos, etc. You can find more information about these laws at www.eeoc.gov.

5. Harassment

Sexual harassment is a severe violation of employee rights and must be avoided at all costs. Harassment is commonly but erroneously associated only with comments or actions that carry a sense of "quid pro quo" (this for that). However, most harassment claims fall under what is termed *hostile work environment*, wherein the culture of the organization is considered offensive even in the absence of a transactional quid pro quo overture. The bottom line is employees deserve a safe and supporting place to work where they are not berated, coerced or objectified.

Big caveat: This law is also very loosely interpreted. Harassment claims may be made by the employee or a coworker of the employee being harassed. One employee can file a harassment suit against you because your treatment of one of their coworkers makes it impossible for them to do their job without stress or fear of similar treatment. Bottom line: Demand the best out of employees but treat them with respect and courtesy.

(We're halfway there. Stop and take your second or third aspirin about now.)

6. The Prospective Employee Interview

Discrimination in hiring laws significantly constrains what you can and cannot ask a prospective employee. In addition to the standard race, sex and creed issues that cannot be addressed, other examples of things you cannot ask during an interview include marital status, availability of transportation, residence, worker's compensation history, disability status or history, and the number of dependents—just to name a few.

To avoid any implications of discrimination in the hiring process, familiarize yourself with discrimination laws and follow strict hiring guidelines as outlined in your employee manual. It is also not advisable to have other employees "interview" the candidate in private unless they are thoroughly trained in what they can and cannot ask or say. Remember, hiring discrimination is one of the common causes of employee litigation.

7. Embezzlement

No one wants to believe an employee would ever steal from them, but it happens every day. Five good optometrist friends of mine come to mind who suffered losses that would pay the salaries of a couple of employees a year—all of my friends are fine, successful doctors who were simply too busy or trusted too much. Trust is laudable, but standard business protocols are necessary to protect you and your good employees from those who are deceitful or who simply make wrong decisions based on stresses or bad fortune in their lives.

Your office operations manual should clearly spell out the checks and balances you use to ensure proper handling of your hard-earned money, and your employee manual should contain a policy of zero tolerance for deceit in the workplace.

8. Staff Training Required by Law

Staff training is an investment that has a very high rate of return. The more your staff can do without unnecessary supervision, the more time you have to do what doctors should do—take care of patients. This should not be considered an employee headache.

Rather, the headache comes from the federal requirement that you provide documented evidence of staff training in the three major healthcare compliance areas—Health Insurance Portability and Accountability Act (HIPAA), hazards (OSHA/CDC) and now the new Fraud and Abuse Compliance regulations.

Almost everyone is familiar with HIPAA although estimates are that less than half of doctors are compliant, especially with all the 2013 and 2014 changes. Fraud and Abuse is now the number one issue under investigation by the OIG. Filing improper or medically unnecessary care used to be considered more of a mistake—now it is considered a crime. All three laws require written office policy, structured employee training and documentation the training was completed. Unless you want to spend hundreds of hours on the Internet becoming an expert in these programs, compliance companies can help with these federal mandates.

9. Social Media

Employee interaction with social media is a new topic in employee policy. There are no federal or state laws or regulations you must adhere to other than the HIPAA Privacy Act. It is highly recommended that you develop policies in your employee manual regarding employees posting on at least your office social media sites.

The best advice is to have one person in charge of monitoring, posting and answering all posts on social media feeds. Make sure your HIPAA training is clear to all employees regarding the prohibition against posting of protected patient information. Also, be wary of posting patient cases, patient pictures or other patient information on social or optometry-specific blogs. Federal and district court rulings have already stated that without specific patient authorization, this is a HIPAA privacy violation. One ruling determined it is a violation even if the patient was not or even could not be identified.

10. Not Documenting Everything

With research on your own or after consultation with a compliance company or HR attorney, you can become familiar with the laws required at the federal level and in your state as the "boss" of your practice. But just having the knowledge is not enough. Much like medical records, you must document everything—as the saying goes, "not written down, not done."

A complete employee manual is an essential component of owning a business. Not having an employee manual is like practicing without professional liability insurance—you have little to no defense against any action a disgruntled or "entrepreneurial" employee may take who feels you have wronged them or is simply out to test the limits of our employee-centric policies. Although the odds aren't high that an employee will ever sue you, in today's society the likelihood is much higher than a malpractice suit from a patient. Employee manuals are necessary to inform your employees of your policies and protect you and your other employees from the actions of problematic or litigious employees.

To protect yourself from financial risk, harm to your reputation and even potentially criminal allegations, you must know and comply with the law, document your policies and treat all employees in a fair and consistent manner.

Rules, compliance standards and massive intervention in our practices, especially in HR management, has unfortunately become the norm. It is imperative we all protect our good employees and the financial livelihood of our practices. ■

Dr. DeLoach is president and CEO of Optometric Business Solutions, a compliance and insurance billing company that specializes in optometry business practices.

Test Your Employment Law Knowledge

1. One of your employees tells you it is hard for them to work because you are constantly yelling at your office manager.

A. Fire the whiny employee.

B. Tell them how you treat your office manager is no concern of theirs and they should just do their job.

C. Apologize. Have a frank discussion with the employee on how you can eliminate their concerns.

ANSWER: C. Harassment laws apply to creating a hostile work environment. Hostile work environment can be defined as an employee who feels their ability to do their job is impeded by stress or fear created by your treatment of them or any other employee.

2. You need to hire a new office manager. As part of your application process, you require a criminal background check, a credit status check and a drug test. The applicant provides the information, which reveals that they were arrested for shoplifting years ago.

A. Decline to hire them.

B. Ask for a complete explanation of the alleged criminal action so you can make a better decision.

C. Consider a serious review of your state laws on hiring practices.

ANSWER: C. There are numerous Federal and State regulations regarding what you can and cannot ask or obtain from a job applicant. Failure to abide by these rules can land you in a discrimination lawsuit—even if your decision is based on a criminal record you may or may not have had the authority to obtain.

3. You have no employee manual or documented office policies—no rules means you cannot be held liable for your actions. One of your employees tells you they have filed a discrimination suit against you because they feel their yearly salary adjustment was not fair. How do you respond?

A. Tell them their salary is based on your opinion of their job performance and you evaluate every one individually.

B. Get an attorney.

C. Tell them if they don't like what you pay them they can always work somewhere else.

ANSWER: B. Your opinion devoid of documented rules and policies will not serve you well in front of a judge. The courts want evidence that you have policies in place that ensure equal and unbiased treatment of each individual employee.

1. US Department of Labor Wage and Hour Division. Fact Sheet #17A: Exemption for Executive, Administrative, Professional, Computer & Outside Sales Employees Under the Fair Labor Standards Act (FLSA). Available at: www.dol.gov/whd/regs/

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Hormones and Ocular Health

Thyroid eye disease is complex and confounding. This comprehensive review connects the pathophysiology to its clinical presentation. By Len Koh, PhD, OD

Reports of thyroid gland enlargement—or goiter—date back to ancient times, as documented in Chinese and Greek texts, but observers did not connect the presentation with proptosis and other signs of thyroiditis until the 7th century.[1] It would take another millennium before more details on the disease were established. From 1834 to 1835, Robert James Graves presented a series of patients with goiter, palpitation and proptosis. Around the same time, German physician Carl Adolph von Basedow described a few patients with "exophthalmic goiter."[1]

Researchers have made significant progress in the basic understanding and clinical management of thyroid eye disease (TED) over the last two centuries. However, many questions remain unanswered regarding its etiology, pathophysiology and optimal management. Clinical management of ocular symptoms is important in enhancing the patient's quality of life. Primary eye care providers play a critical role in effective management of TED. This article will review current clinical guidelines for TED management.

Thyroid Gland and Hormones

The butterfly-shaped thyroid gland is located at the upper ventral aspect of the trachea, just below the laryngeal prominence (commonly called the Adam's apple). Normally, the thyroid gland is so small that it is difficult to feel on the throat. However, pathologies can enlarge the gland and form a goiter.[2]

To better connect thyroid physiology to pathology, we begin with a brief refresher of the thyroid and the hormones it produces. Thyroid hormones are essential to brain and somatic development in infants and metabolic regulation in adults. They play a role in the function of most organ systems (including heart rate), metabolism of energy sources, temperature, fertility, digestion and skin health.[2]

The hormones thyroxine (T4) and triiodothyronine (T3) derive from a tyrosine-based precursor molecule in combination with iodine. Biosynthesis of thyroid hormones takes place

Release Date: November 2014
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Goal Statement: Hyper- or hypothyroidism can cause thyroid eye disease (TED), with symptoms that include proptosis and optic neuropathy. Eye care providers play an important role as the first line of defense to diagnose patients with TED and help improve their quality of life. This course will review current guidelines for TED management.

Faculty/Editorial Board: Len Koh, PhD, OD
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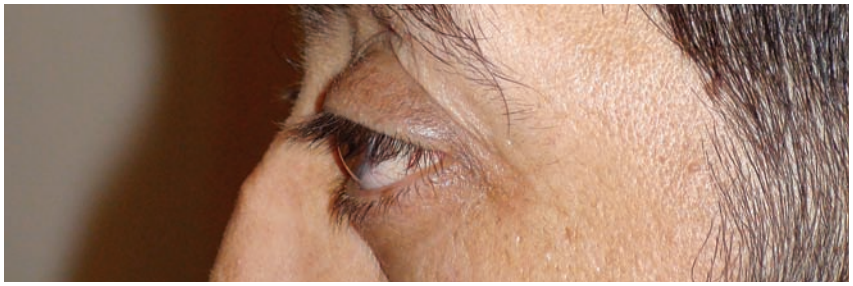


1. Swelling of the lower eyelids and redness at the right lateral rectus muscle insertion and left medial rectus muscle insertion in a patient with TED.

in the thyroid follicular cells, but ultimate release of these hormones is centrally regulated by the hypothalamus. Thyroid-releasing hormone (TRH) is produced and secreted by the hypothalamus, which then emits thyroid-stimulating hormone (TSH) from the anterior pituitary. TSH regulates both the biosynthesis and secretion of T4 and T3 from the thyroid gland. Excess T4 and T3 in the blood serve as a negative feedback signal to inhibit the release of further TSH.[2]

After synthesis, thyroid hormones bind to the protein thyroglobulin, which catalyzes the biosynthetic process and serves as a reservoir for the hormones. Hydrolysis of the thyroglobulin-hormone complex frees the hormones and releases them into the blood stream. Eighty percent of the hormones then bind to circulating thyroxine-binding globulin (TBG). The remainder, known as free T4 and T3, attach to other serum proteins, such as transthyretin, albumin and lipoproteins. These serums are transported to various cells in the body. Serum proteins play an important role in regulating the thyroid hormone activity because only free T4 and T3 are biologically active.[2]

Serum T4 and T3 can enter the cells of most organs by energy that requires thyroid hormone transport. Once inside the cells, the hormones interact with nuclear receptors that mediate virtually all related physiologic actions.[2]

Systemic Thyroid Disease

TED is most commonly associated with Graves' disease (GD), but is also seen in other forms of systemic thyroid disease, such as Hashimoto's thyroiditis, as well as primary hyper- and hypothyroidism.[3]

• ***Graves' disease.*** The thyroid stimulating hormone receptor (TSH-R) of the thyrocyte is the main target in patients with GD. Unlike other autoimmune diseases, where the targets are often destroyed, autoantigen in GD stimulates TSH-R, resulting in an overproduction of thyroid hormones.[4] Goiter is a common sign of GD. TED is the most common extrathyroidal complication.

• ***Hyperthyroidism.*** Most patients with TED have hyperthyroidism, but the disease can manifest in patients with hypothyroidism as well. Symptoms of hyperthyroid include weight loss, diarrhea, hair loss, nervousness, increased sweating, goiter and insomnia. TED usually develops concomitantly or soon after the onset of hyperthyroidism, but may show up before the diagnosis of hyperthyroidism in 20% of patients—so, you could be the first to diagnose the disease.

• ***Hypothyroidism.*** Typical symptoms of hypothyroidism include loss of energy, weight gain, difficulty concentrating, mental fatigue, constipation, cold intolerance and dry skin and hair. We may, understandably, miss these symptoms because they're mild and we may attribute them to stress, depression or age. Dry eye symptoms are common due to impaired lacrimal gland function, redundant inferior bulbar conjunctival tissue or lid retraction.

Overtreatment of hyperthyroidism is another common cause of hypothyroidism; it can occur after radioactive iodine therapy or thyroidectomy.

• ***Hashimoto's thyroiditis.*** A recent study involving 91 patients with Hashimoto's thyroiditis reported a third of the patients had upper eyelid retraction on careful examination.[5] Hashimoto's thyroiditis, an autoimmune disorder in which antibodies damage the thyroid gland, is the most common cause of hypothroidism. Therefore, eye care providers should include hypothroidism as a differential in patients with chronic dry eye syndrome.

TED's Symptoms and Signs

You may notice that ocular symptoms of TED, particularly dry eye, sometimes occur prior to any apparent clinical signs of either ocular or systemic disease. Ocular discomfort is estimated to occur in 40% to 72% of those with TED. Common symptoms of TED include a dry and gritty ocular sensation, photophobia, diplopia and a pressure sensation behind the eyes. These symptoms can manifest any time in the course of GD, but they are most commonly associated with the clinical signs of eyelid retraction, enlargement of orbital tissues and proptosis—all of which can lead to incomplete blinking and overexposure of the ocular surface, resulting in dry eye.[6]

Besides ocular discomfort, TED changes a person's appearance and may cause significant psychological stress that affects their quality of life.[7] For instance, patients may restrict their social and daily activities because TED negatively altered their self-image.

Clinical Features

• ***Proptosis.*** Progressive expansion of orbital tissue, fat and muscle leads to proptosis. The presentation manifests in 63% to 74% of those diagnosed with TED. Further, eyelid retraction may be the disease's earliest sign (*figure 1)*; it is detected in 57% to 98% of affected adults.[3] The causes are increased sympathetic stimulation of Mueller's muscle and overaction of the levator muscle.[8]

Perform exophthalmometry if you suspect thyroid disease, keeping in mind that typical results vary with race. Normal values are 16.5mm in white men and 15.4mm in white women.[9] You will see slightly higher numbers in black patients—averages noted in the literature are approximately 18.5mm for black men and 17.8mm for black women. The upper limit of normal is 21mm for white males and 19mm for white females, compared to 24mm for black males and 23mm for black females. The upper limit in those from Japan is as small as 14mm.[10]

Apical compression and optic neuropathy occur more frequently in Asians compared to whites and blacks because of shallower orbits and narrower apices.[3] As TED is mainly a bilateral disease, exophthalmometry values should be symmetric; however, values may be asymmetric or unilateral in 15% of patients.[3]

• ***Optic neuropathy.*** Approximately 5% to 7% of those with TED develop optic neuropathy secondary to orbital compressive effects on the optic nerve.[3] Signs of this emergent and potentially blinding complication include reduced visual acuity or color vision, as well as visual field defects such as an enlarged blind spot, generalized constriction and paracentral or arcuate scotoma.[11] A reduced visually evoked potential may be the earliest sign of optic nerve involvement.[12] The optic nerve may appear normal, swollen or pale, and choroidal folds may be present.

• ***Other signs.*** Lid and conjunctival chemosis, conjunctival injection, exposure keratopathy and superior limbic keratoconjunctivitis are commonly seen in patients with TED. Corneal ulceration and perforation can present in severe cases of untreated or intractable TED.[6] Diplopia occurs in 40% to 60% of TED cases due to inflammation and swelling of the extraocular muscles *(figure 2)*. You can use the mnemonic device "I'M SLOW" to remember the order of decreasing frequency of muscle involvement (Inferior, Medial, Superior, Lateral, Obliques).[3]

Molecular Mechanisms of TED

Although the pathophysiology of TED is not fully understood, investigators have made significant progress in identifying key targets of the disease over the last several decades. TSH-R has long been suspected as a likely target of autoimmune reactions in TED.

Expression of TSH-R is relatively low in normal orbital tissues, but it elevates significantly in TED patients.[6] Additionally, the anti-TSH-R antibody level is high in those with TED, supporting the hypothesis that these receptors are the primary auto-antigen in those diagnosed with TED.

Orbital fibroblasts are the primary cells involved in the development of TED.[13] These cells mediate the autoimmune process. They activate to produce excess collagen fibrils and glycosaminoglycans (GAGs), such as hyaluronan, that are negatively charged and extremely hydrophilic. The extracellular material causes swelling or enlargement of the extraocular muscles. Furthermore, adipogenesis (fat cell production) may occur through differentiation of fibroblasts, as well as peroxisome-proliferator-activated receptor γ (PPAR-γ).[8] Enlargement of the extraocular muscles and excess fat production result in proptosis.

Ocular Signs of Dysthyroidism

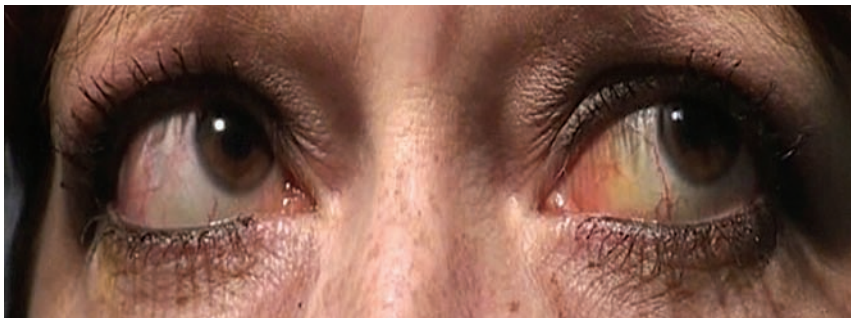
Thyroid eye disease is relatively common in patients with dysthyroidism. The earliest ocular sign is lid retraction, and dry eye symptoms are the most common ocular complaint. TED should always be a potential differential diagnosis for patients with prior history of thyroid disorders and dry eye. Additionally, some patients may present with ocular signs before the diagnosis of dysthyroidism, so primary eye care professionals may be the first provider to make the diagnosis.

Superior limbic keratoconjunctivitis (SLK) is often missed or misdiagnosed as dry eye, and may be due to dysthyroid-based lid retraction. Signs include chronic bilateral superior limbus and corneolimbal injection, keratinization and thickening. The clinician should lift the patient's upper eyelids with the patient looking down to identify this condition. Treatment includes off-label 0.5% silver nitrate ophthalmic solution, conjunctival resection or debridement, liquid nitrogen therapy and amniotic membrane transplant.[23]

The trace element selenium, prescribed at 100mg PO BID, has been found to render a therapeutic effect in patients with mild TED.[8] Fresnel prisms or monocular occlusion can eliminate diplopia temporarily. Botulinium toxin injection may help to relieve eyelid retraction. Additionally, educate patients to stop smoking and continue to take medications to reach and maintain a euthyroid state.

Epidemiology and Risk Factors

• ***Age and gender.*** The incidence of TED ranges from 0.1% to 0.3%.[3] Women are five times more likely to be affected than men, with an estimated incidence of 16 women and three men per 100,000 individuals.[8] Age factors into both time of onset and severity. TED may develop earlier in life in women than in men. A recent Japanese study of 10,931



2. Lid retraction greater on the right eye in a patient with TED. Note the crossing of the upper eyelid margin at 11 o'clock and 1 o'clock limbus positions in the right eye, compared to the 10 o'clock and 2 o'clock positions on the left eye.

consecutive TED patients over 10 years reported a mean age of onset of 39 years for women and 43 years for men.[10] Albeit rare, TED can affect children, with an estimated incidence of 0.1 per 100,000 in prepubescent and 3.0 per 100,000 in postpubescent adolescents.[14] Fortunately in these instances, the clinical manifestations are less severe than those exhibited by adults.

• ***Genetic and environmental factors.*** Cumulative evidence suggests that both genetic and environmental factors play a role in the development of TED. Because GD is generally regarded to be an autoimmune disease, genes that govern immunity are likely suspects. Not surprisingly, various human leukocyte antigen (HLA) genotypes, such as HLA-DRB1*03, DRB1*04 and DRB1*07, have been associated with TED in whites.[15] Other immunomodulary genes have been implicated, including cytotoxic T lymphocyte antigen (CTLA-4), interleukin-1 (IL-1), interferon gamma (IFNγ), CD40 and tumor necrosis factor alpha (TNFα).[3]

• ***Cigarette smoking.*** The strongest modifiable risk factor associated with TED is smoking. Tobacco use exacerbates disease progression and attenuates the effects of orbital radiotherapy and high-dose systemic glucocorticoids.[3] Researchers continue to study the effects of cigarette smoking on TED. We know that the direct effects of toxins and heat from inhaled cigarette smoke harm the thyroid gland.[16] Therefore, you must educate patients about the harmful effects of smoking and advise them to quit.

Stress, lithium exposure, iodine intake levels and use of certain prescription drugs (e.g., amiodarone) also are potential risk factors for the development of TED.[17]

Classification Systems

TED progresses slowly and presents with a wide range of clinical manifestations. Although numerous classification systems are known, no single one defines TED fully. (Visit http://links.lww.com/WNO/A100 to view a table that compares the four most frequently referenced classification systems.[13])

• ***NO SPECS.*** In 1969, Werner devised the first widely accepted classification of ocular findings associated with GD using the catchy mnemonic NO SPECS *(Table 1)*. This system measures the severity of changes in the eye, and is still commonly used by optometrists in light of its simplicity.

• ***CAS.*** Clinical Activity Score (CAS) focuses on pain, redness, swelling and impaired function *(Table 2)*.

• ***VISA.*** Vision, Inflammation, Strabismus and Appearance (VISA) assesses patients using the clinical features of TED that comprise the mnemonic.

• ***EUGOGO.*** The European Group on Graves' Orbitopathy (EUGOGO) devised this assessment protocol, which simplifies classification into mild, moderate-to-severe, and sight-threatening or very severe using a scoring system.

If you prefer an even simpler method, some observers broadly categorize TED into two types, based on symptomology:[19]

– *Type 1* exhibits minimal inflammation and restrictive myopathy.

– *Type 2* includes significant orbital inflammation and restrictive myopathy.

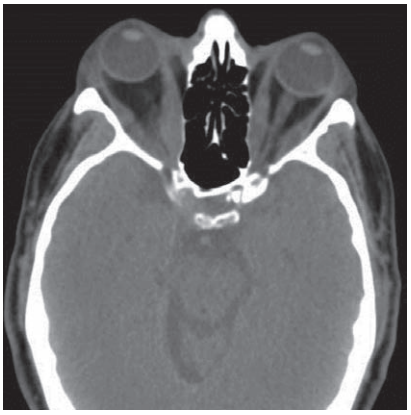
Differential Diagnosis

TED isn't easy to diagnose. It can manifest without a prior history of dysthyroidism, and its signs and symptoms are similar to those produced by other ocular conditions. A few differential diagnoses to consider when patients present with signs of orbital inflammation or congestion include idiopathic orbital inflammation, orbital cellulitis and sarcoidosis. Suspect infectious causes if the patient has a history of recent illness, such as sinusitis with accompanying fever.

• *Idiopathic orbital inflammation* has a more rapid onset, with pain being the most common symptom. This condition is highly responsive to oral steroid treatment.

• *Orbital cellulitis* tends to have a more acute presentation with pain and possible fever. Urgent referral for CT or MRI is indicated for definitive diagnosis and prompt management of orbital cellulitis.

• *Sarcoidosis* is more common among blacks and Northern Europeans. Chest X-ray and biopsy of an enlarged lacrimal gland can aid in diagnosis.[11] Table 3 presents



3. Orbital CT without contrast showing extraocular muscle enlargement with sparing of the tendons. Compression of the right optic nerve is also evident.

Clinical Pearls

- The development and progression of TED does not depend on the status of thyroid disease and should be managed independently.
- Achieving and maintaining a healthy thyroid state requires the management of an endocrinologist.
- Smoking, a modifiable risk factor, should be eliminated. Cessation counseling is critical in this process.
- Concurrent use of oral corticosteroids tapered over a three-month period can prevent or minimize the adverse effects of radioactive iodine therapy.
- Because TED is self-limiting in nature, supportive therapy with lubrication and sunglasses is effective in mild cases.
- Oral corticosteroids and/or immunosuppressants are effective in controlling the active phase of TED.
- Surgical intervention is recommended only in the inactive phase or to stabilize TED symptoms for three to six months, unless indicated sooner by the presentation of dysthyroid optic neuropathy or corneal ulceration.
- Removal of one or two orbital walls and/or orbital fat is done to preserve sight in vision-threatening compressive situations. Strabismus surgery may then be needed, followed by blepharoplasty, to correct any eyelid retraction. Finally, cosmetic lid/facial surgery may be performed as requested.
- TED requires a multidisciplinary team for optimal diagnosis and management.

some of the differential diagnoses for TED and their clinical features and management.

Additional Workup Elements

• ***Laboratory testing.*** Many TED patients are already under a doctor's care for thyroid disease and may be on medical therapy, so further blood workup may not be necessary. However, a laboratory order to assess thyroid gland function may be essential in those who exhibit signs and symptoms of TED. When appropriate, order a thyroid panel to measure the TSH levels and free T4 and T3. Other health care providers may miss subclinical thyroid diseases if they only obtain serum TSH. This alone is inadequate as a screening test because the range of TSH levels varies widely.

Testing for TSH-R antibodies and thyroid stimulating immunoglobulin (TSI) will help you differentiate Graves' disease from Hashimoto's thyroiditis, and both are good markers of clinical activity.[12] TSH-R antibodies >50% or TSI >8.8 IU/L are present in virtually all patients with Graves'-related TED.[8] Measurements of anti-thyroid peroxidase antibodies (TPO-Ab) and anti-thyroglobulin antibodies (Tg-Ab) help to confirm the diagnosis of autoimmune thyroid disease.

• ***Orbital imaging.*** Consider ordering an orbital CT or MRI to evaluate the extent of orbital tissue enlargement *(figure 3)*. Extraocular muscle enlargement with sparing of the tendons is indicative of TED.

Table 1. NO SPECS Classification[18]

Score		Feature
0	N	No symptoms or signs
1	O	Only signs, no symptoms
2	S	Soft tissue involvement
3	P	Proptosis
4	E	Extraocular muscle involvement
5	C	Corneal involvement
6	S	Sight loss

Table 2. Clinical Activity Score (CAS)

Pain	Painful, oppressive feeling on or behind the eye over the past four weeks. Pain on attempted eye movement over past four weeks.
Redness	Eyelid(s) red. Diffuse conjunctival injection covering at least one quadrant of eyeball.
Swelling	Swollen eyelid(s). Swollen caruncle. Proptosis increasing >2mm over past one to three months.
Loss of Function	Reduced eye movements (>5° in any direction over one to three months). Reduced visual acuity (loss of at least one Snellen line over one to three months).

Table 3. Differential Diagnoses for TED: Clinical Features and Management

Condition	Presentation	Associated Features	Management
Idiopathic orbital inflammation	Rapid onset	Pain	Oral steroid
Orbital cellulitis	Acute presentation	Pain, possible fever	Orbital CT/MRI, anti-infectives
Sarcoidosis	Chronic onset	Blacks, Northern Europeans	Chest X-ray, lacrimal gland biopsy
Sinusitis	Acute or chronic	Pain, often fever	CT of sinuses, anti-infectives
Orbital tumor	Unilateral presentation	Proptosis, choroidal folds	Orbital CT/MRI, lesion excision/ destruction
Cavernous sinus fistula	Primarily unilateral	Orbital bruit, pulsatile proptosis, dilated conjunctival vessels	Orbital/cranial MRI, surgical treatment
Cranial nerve palsies/paresis	Often unilateral	Various strabismic presentations and etiologies	Identify involved muscle(s), cause(s), direct management to cause and diplopia relief
Chronic progressive external ophthalmoplegia (CPEO)	Bilateral, slowly progressive	Initial proptosis, later gradual extraocular muscle paralysis, several etiologies	Nutritional, visual/ocular management, surgical treatments
Myasthenia gravis	Chronic, progressive	Fatigue is hallmark. Initial ocular muscle weakness, later systemic muscle weakness	Medication, visual/ocular management, surgical and rehabilitative therapies

Increase in orbital fat tissue volume, proptosis, enlargement of the lacrimal gland, vascular engorgement and bowing of the medial orbital wall may also be evident on neuroimaging.

Imaging is critical in your assessment of apical crowding and the risk of compressive optic neuropathy. Consider ordering neuroimaging in patients with any newly confirmed or advancing proptosis, extraocular muscle restriction or evidence of optic neuropathy (a relative afferent pupillary defect; optic nerve swelling or pallor; or a visual acuity, visual field or color vision defect). You can refer the patient for biopsy and analysis of orbital tissue, including the lacrimal gland, in atypical cases.[11]

Clinical Management

A recent prospective study involving 346 patients over eight years revealed that about three-quarters did not demonstrate TED at presentation.[20] Approximately 20% had mild TED, 6% had moderate-to-severe TED and only 0.3% had evidence of compressive optic neuropathy. The majority of those with no TED at presentation continued to be symptom free at 18 months. Further, spontaneous improvement was common in those with mild TED at presentation.[20]

Although the majority of patients with TED do improve spontaneously over time, cumulative evidence from various studies suggest that prompt treatment to restore and maintain euthyroidism limits morbidity from GD and TED.[3]

As primary care physicians, we are the first line of defense in diagnosing patients with TED and helping improve their quality of life. Similar to other autoimmune diseases, clinical management should involve an interdisciplinary team that includes primary care physicians, endocrinologists and neuro-ophthalmologists.

TED has two distinct phases: active and inactive/non-progressive. It is important to distinguish between them because treatment is very different for each.[3] The active phase is characterized by lymphocyte infiltration and cytokine secretion leading to fibroblast proliferation. This phase can progress over six to 24 months, with worsening ocular symptoms and signs. Once the active phase subsides, spontaneous clinical improvement over several months may follow.

Regression of the active inflammatory phase is not always a sign of recovery because the inactive phase may lead to fibrosis of orbital tissues resulting in irreversible damage, including permanent eyelid retraction, proptosis and diplopia.[13] Anti-inflammatory drugs are usually indicated in the active phase, whereas surgical intervention may be necessary to remove fibrotic tissues in the chronic stage.[3]

Most patients with TED can successfully manage their symptoms with artificial tears and/or ointments for lubrication, sunglasses for protection against dust and bright light, sleeping with the head raised and/or taping the eyes shut to minimize nocturnal ocular exposure.[6]

Patients with moderate-to-severe TED generally require more aggressive medical treatment. Because inflammation is the main culprit responsible for the active phase of TED, oral or intravenous corticosteroid treatment can be effective in suppressing the inflammatory response. Intravenous corticosteroid

Table 4. TED Treatments: Dosages, Advantages and Disadvantages

Treatment	Typical Dose	Advantages	Disadvantages
Selenium supplementation	100µg BID	May improve mild thyroid orbitopathy disease	Linked to increased risk of Type 2 DM in 400µg/day dosage
Ocular surface lubrication	Artificial tears, ointments, gels and topical cyclosporine, punctal occlusion, tarsorrhaphy	Reduced exposure, keratopathy from proptosis/lid retraction	Drop/preservative sensitivities/ allergies, epiphora, cosmesis (from tarsorrhaphy)
Systemic corticosteroids	IV methylprednisolone 1g twice weekly for six weeks; or oral prednisone 60mg/day to 80mg/day tapered every two weeks for four to six months	Reduces orbital infiltration/compression and associated potential compressive optic nerve damage	Inconvenience of hospitalization for IV; several undesirable oral steroid side effects
Orbital decompression surgery	Hospitalization on urgent basis	Reduces compressive optic neuropathy	Hospitalization, surgical risks
Radiation therapy	20Gy in 10 fractions	May stabilize TED and eliminate symptoms of TED; oral steroid often used in conjunction	Lack of clinical validity, unsure mechanism of action, unclear clinical indications
Rituxan (rituximab, Genentech)	100mg in single infusion; or IV infusion 1,000mg once every two weeks for one month	May improve vision and prevent relapses	Rare infusion site reactions requiring IV corticosteroids, other adverse reactions
Insulin-like growth factor 1 receptor (IGF-1R)	Currently ex-vivo experimental studies	Evidence linking IGF-1R with the autoimmune mechanism of TED	Currently in initial stages for human subject trials

administration is not as convenient for the patient, but it is more effective and yields fewer side effects.

Orbital radiotherapy (ORT) may be useful if corticosteroid treatment is not tolerated. However, the efficacy of ORT is variable, and its use is controversial. Orbital decompression surgery can alleviate compression if the optic nerve is being compromised. The surgeon removes orbital fat or expands the orbital walls. This is typically reserved for patients in the nonactive stage, but is also used when severe orbital inflammation, proptosis, exposure keratopathy or optic neuropathy is present *(Table 4)*.

Drug Treatments for TED

In addition to treatment of ocular complications, therapy is indicated to normalize thyroid hormone levels. Hyperthyroidism can be treated medically with anti-thyroid drugs, such as Tapazole (methimazole, Pfizer) and PTU (propylthiouracil, Actavis Elizabeth), which inhibit the synthesis of the thyroid hormones T4 and T3. Thyroidectomy or radioactive iodine (RAI) that destroys thyrocytes are also viable options to decrease thyroid hormone production. Synthroid (levothyroxine, AbbVie) is standard treatment for hypothyroidism. This synthetic thyroid hormone acts to restore proper hormone levels, which reduce the signs and symptoms associated with hypothyroidism.

With better understanding of the molecular mechanisms underlying the pathogenesis of TED, new therapeutic agents that target the immune system are being developed and tested.[8] For example, anti-TNF agents are being designed to neutralize cytokine-induced inflammation and hyaluronan synthesis by orbital fibroblasts. In preliminary studies, Rituxan (rituximab, Genentech), an anti-CD20 monoclonal antibody, has shown promise in being effective in active TED.[8] In the chronic or inactive phase, surgical correction may be necessary to remove fibrotic tissue.[13] Additionally, strabismus or eyelid surgery may be necessary after the active phase has subsided.

Medical and surgical treatment for systemic GD has minimal or no effect on the development and worsening of TED.[21] In fact, RAI can lead to new onset or worsening of TED. This worsening can be ameliorated with prophylactic oral steroids, such as prednisone, during the course of radioactive treatment.[22]

TED is a complex disease that

Online Resources

National and international organizations have been established over the past decade in a concerted effort to develop a universal standard for reliable identification of the disease phase, diagnosis and accurate measurement of therapeutic outcomes. Below are the links:

- EUGOGO: www.eugogo.eu
- International Thyroid Eye Disease Society: http://thyroideyedisease.org
- Neuro-Ophthalmology Research and Development Consortium Nordic Clinical Trials www.nordicclinicaltrials.com/nordic

requires a multidisciplinary team of providers to manage the disease optimally. Optometrists can play an important role in diagnosis, patient education, smoking cessation recommendation and supportive ocular therapy for patients with TED in enhancing their quality of life. ■

Dr. Koh is the director of Pacific EyeClinic located in Hillsboro, Ore. He also serves as chief of Medical Eyecare Services of Oregon.

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OSC QUIZ

You can obtain transcript-quality continuing education credit through the Optometric Study Center. Complete the test form *(page 61)*, 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.

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1. The MOST common extrathyroidal complication from Graves' Disease (GD) is:
a. Goiter.
b. Thyroid eye disease (TED).
c. Parotid gland enlargement.
d. Parathyroid gland enlargement.

2. The main molecular target stimulated by autoantigen in Graves' disease is:
a. Thyroid stimulating hormone receptor.
b. Thyroxine receptor.
c. Calcitonin receptor.
d. Transthyretin.

3. Typical symptoms of hypothyroidism include any of the following EXCEPT:
a. Weight gain.
b. Tachycardia.
c. Intolerance to cold.
d. Mental fatigue.

4. _____could be the earliest clinical sign of thyroid eye disease (TED).
a. Diplopia.
b. Proptosis.
c. Optic neuropathy.
d. Lid retraction.

5. The most common ocular complaint for patients with dysthyroidism is:
a. Dry eye symptoms.
b. Diplopia.
c. Mucous discharge.
d. Itch.

6. The common symptoms of thyroid eye disease such as dry/gritty sensation, photophobia, a pressure sensation behind the eyes, and double vision, are caused mainly by each of the following signs EXCEPT:
a. Eyelid retraction.
b. Orbital tissue enlargement.
c. Complete blinking.
d. Proptosis.

7. One of the earliest ocular signs seen in Hashimoto's thyroiditis is:
a. Proptosis.
b. Hyperlacrimation.
c. Eyelid retraction.
d. Ptosis.

8. Which ocular muscle tends to be affected first by TED?
a. Medial rectus.
b. Inferior rectus.
c. Lateral rectus.
d. Superior oblique.

9. _____treatment can lead to new onset or worsening of thyroid eye disease, as well as irreversibly impair lacrimal gland function.
a. Methimazole (Tapazole).
b. Propylthiouracil (PTU).
c. Radioactive iodine (RAI).
d. Thyroidectomy.

10. Untreated or intractable TED can result in corneal _____.
a. Thinning.
b. Ulceration and perforation.
c. Thickening.
d. Hydration.

11. The largest normal exophalmometric readings are commonly seen in patients of which ethnic background?
a. White.
b. Black.
c. Asian.
d. Latino.

12. According to a recent meta-analysis, which modifiable environmental factor is MOST associated with progression of thyroid eye disease as well as reduced TED treatment efficacy?
a. Drinking.
b. Smoking.
c. Narcotic use.
d. Sun exposure.

13. Thyroid eye disease is most common in:
a. Men.
b. Women.
c. Girls.
d. Boys.

OSC QUIZ

14. Pharmaceutical risk factors for the development of thyroid eye disease include each of the following EXCEPT:
a. Beta-blockers.
b. Amiodarone.
c. Iodine intake/therapy.
d. Lithium.

15. Which receptor is often elevated in the orbital tissue of patients with thyroid eye disease, assisting in the diagnosis?
a. Thyroxine (T4).
b. Triiodothyronine (T3).
c. Thyroglobulin.
d. Thyroid stimulating hormone (TSH).

16. Which of the following conditions is MOST likely to have a pulsatile proptosis?
a. Thyroid eye disease.
b. Myaesthenia gravis.
c. Cavernous sinus fistula.
d. Progressive external ophthalmoplegia (CPEO).

17. Which of the following tests is BEST for helping diagnose thyroid eye disease?
a. Thyroid stimulating hormone (TSH).
b. Thyroxine (T4).
c. Triiodothyronine (T3).
d. All of the above.

18. Each of the following may help in reducing ocular exposure from thyroid eye disease EXCEPT:
a. Taping lids at night.
b. Smoking cessation.
c. Botulinum toxin lid treatment.
d. Artificial tears/ointments.

19. Which of the following tests is NOT indicated to evaluate compressive optic neuropathy?
a. Spinal tap.
b. Orbital MRI.
c. Orbital CT.
d. Visual fields.

20. A trace element that may be beneficial for patients with mild thyroid eye disease is:
a. Selenium.
b. Rituximab.
c. Iron.
d. Copper.

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

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How Suite it Is

New cataract surgery 'suites' avoid some human error by linking measurement devices to surgical instruments. **By Paul C. Ajamian, OD**

Q I have a patient who I sent for cataract surgery and implantation of a toric intraocular lens. When the patient came back, his best-corrected visual acuity was 20/40 due to a misaligned lens. How can this be prevented in the future?

A Fortunately, the future is here. There are several newly available cataract surgery systems that will help the surgeon align the toric lens more accurately. Not many centers have these systems just yet—but they're coming, so you should know what to expect.

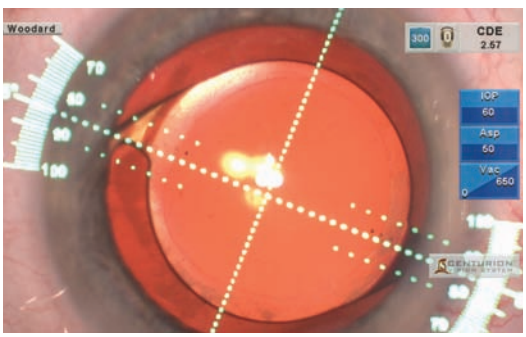
Before discussing what these new surgery systems can do, let's review the heart of the matter: the toric intraocular lens (IOL).

Toric IOLs have been a big hit since their introduction several years ago. First introduced in the 1990s, newer toric IOL designs include the AcrySof Toric (Alcon), approved by the FDA in 2005, as well as the Tecnis Toric (Abbott Medical Optics) and Trulign Crystalens Toric (Bausch + Lomb), both approved in 2013.

These implants allow for better management of corneal astigmatism, leading to less reliance on distance correction and a simpler reading prescription as well. Any patient with more than 1.00D of regular astigmatism is a candidate for a toric lens.

As the comanaging OD, you can play a huge role in counseling patients and obtaining measurements ahead of time. Be sure to obtain corneal topography on every patient before you send him or her for surgery. Also, insurance doesn't cover the extra costs associated with this lens, so you'll need to discuss the price as well as the advantage of correcting the refractive error more naturally inside the eye.

Once a patient chooses this lens, the measurements become critical. Even a minor error in alignment can result in a significant reduction in vision. This is where the new surgical systems shine.



The reticule, as seen through a surgical microscope, helps to align the marks on the toric lens.

Surgical "suites"—such as the Cataract Refractive Suite using the new Verion Image Guided System (Alcon) and the Zeiss Cataract Suite—link the imaging/measurement device with the phaco machine and the operating microscope.

Specifically, the system's imaging device measures the eye using biometric landmarks such as scleral vessels and iris crypts. Then, that information is transferred to the surgical microscope for precise axis alignment and positioning of the toric lens.

The Alcon system goes one step further by communicating this information to its LenSx femtosecond laser, allowing for more accurate placement of arcuate incisions (for astigmatism correction under 1.00D).

Q So, how would such a system have avoided the misaligned toric IOL in my patient?

A Without this technology, eyes are marked "by hand" based on the surgeon's best estimate of where the axis of the astigmatism should be. "This technique has been less reliable and is very difficult to reproduce," says Lawrence Woodard, MD, Medical Director of Omni Eye Services of Atlanta, one of the first practices in the nation to use one of these new surgical suites. "These integrated systems eliminate the need for manual marking, resulting in improved accuracy, reproducibility and visual outcomes," Dr. Woodard says.

With the help of comanaging ODs who can track and share post-surgical refractive data, surgeons will further optimize post-op results with these systems by adjusting future A-scan calculations.

In addition to improved alignment of toric lenses, these instruments also allow for better centration of multifocal IOLs, giving patients their best chance of seeing clearly at all distances after surgery. ■

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Intra-op Astigmatism Correction

How do the options for management during cataract surgery compare?

Edited by Joseph P. Shovlin, OD

Q In light of the recent advances in laser correction of astigmatism, should I now recommend femtosecond laser-assisted treatment when my cataract patients with corneal astigmatism undergo cataract extraction with intraocular lens (IOL) implantation? Or should I continue to recommend a toric IOL for patients with significant astigmatism?

A It depends on the amount of corneal astigmatism (and, of course, patient preference).

"My prediction is that femtosecond laser incisions will be most effective and predictable for a diopter and a quarter or less of astigmatism," says Eric Donnenfeld, MD, who performs refractive and cataract surgery on Long Island. "Over this level of cylinder, IOLs will rule."

Limbal relaxing incisions (LRIs) are one of the more prevalent surgical options for astigmatism management in patients who do not want to wear glasses after cataract surgery. Yet despite moderate procedural success, the perceived risk and required surgical expertise for manual LRIs has prevented many cataract surgeons from even attempting this operation, Dr. Donnenfeld says. As a result, toric IOLs evolved as a safe and effective alternative for astigmatism.

However, these lenses, while revolutionary, are also not without problems. Toric IOLs can rotate off axis, significantly affecting a patient's uncorrected visual acuity—more so than with a spherical IOL. This effect is even more extreme at higher cylinder powers.[1]

The growing use of femtosecond-assisted cataract surgery, in which the laser replaces or augments manual techniques in several steps of the procedure, has led many surgeons to find advantages in femto-created LRIs. Capable of making safe, reproducible incisions at the desired optical zone, depth and length, femto laser technology allows surgeons to operate with greater precision compared to incisional procedures performed manually. Additionally, the laser-made incisions can be opened and adjusted following surgery to improve the refractive result as needed.

Femto procedures to treat corneal astigmatism still harbor some of the same restrictions of bladed incisions, cautions Douglas D. Koch, MD, a Texas-based ophthalmologist who specializes in cataract surgery and laser vision correction. These include "limited range of correction, some unpredictability of the corneal biomechanical response and potential complications including dry eye (from incising corneal nerves) and foreign body sensation (from the incision edges, albeit very rare)."

Overall, however, femtosecond laser technology is much improved over bladed incisions for surgical astigmatism treatment.

"So the issue is, which is better for low amounts of astigmatism: femtosecond laser relaxing incisions or toric IOLs?" says Dr. Koch. "Early data suggests that results are comparable. For less than 1D, the choice is likely relaxing incisions," he says. "In the 1D to 1.25D range, both work well. Ultimately, much depends on surgeon comfort, outcomes and expertise."

In his practice, Dr. Koch typically uses femto LRIs to correct up to 1.0D or 1.25D of astigmatism. Femto-laser intrastromal relaxing incisions in particular help eliminate the risks of dry eye and foreign body sensation. But above 1.25D, "toric lenses are more accurate and better tolerated," he says.

Dr. Donnenfeld recommends femto LRIs—using either intrastromal or penetrating arcuate incisions—in cases of low levels of cylinder (0.75D or less). From 1D to 1.5D, either femto LRIs or toric IOLs would be viable options, he says.

Femto lasers and toric IOLs may someday play complementary roles for surgical treatment of astigmatism at the time of cataract surgery.

"My ultimate prediction is that both toric IOLs and femtosecond laser incisions will emerge victorious," says Dr. Donnenfeld, when used in tandem. He envisions a surgical protocol that combines "the safety and precision of femtosecond cataract surgery with a toric IOL, and a femtosecond laser astigmatic incision created but not opened" during the procedure; the presence of the latter will allow "for postoperative adjustment of any residual refractive error," if needed. ■

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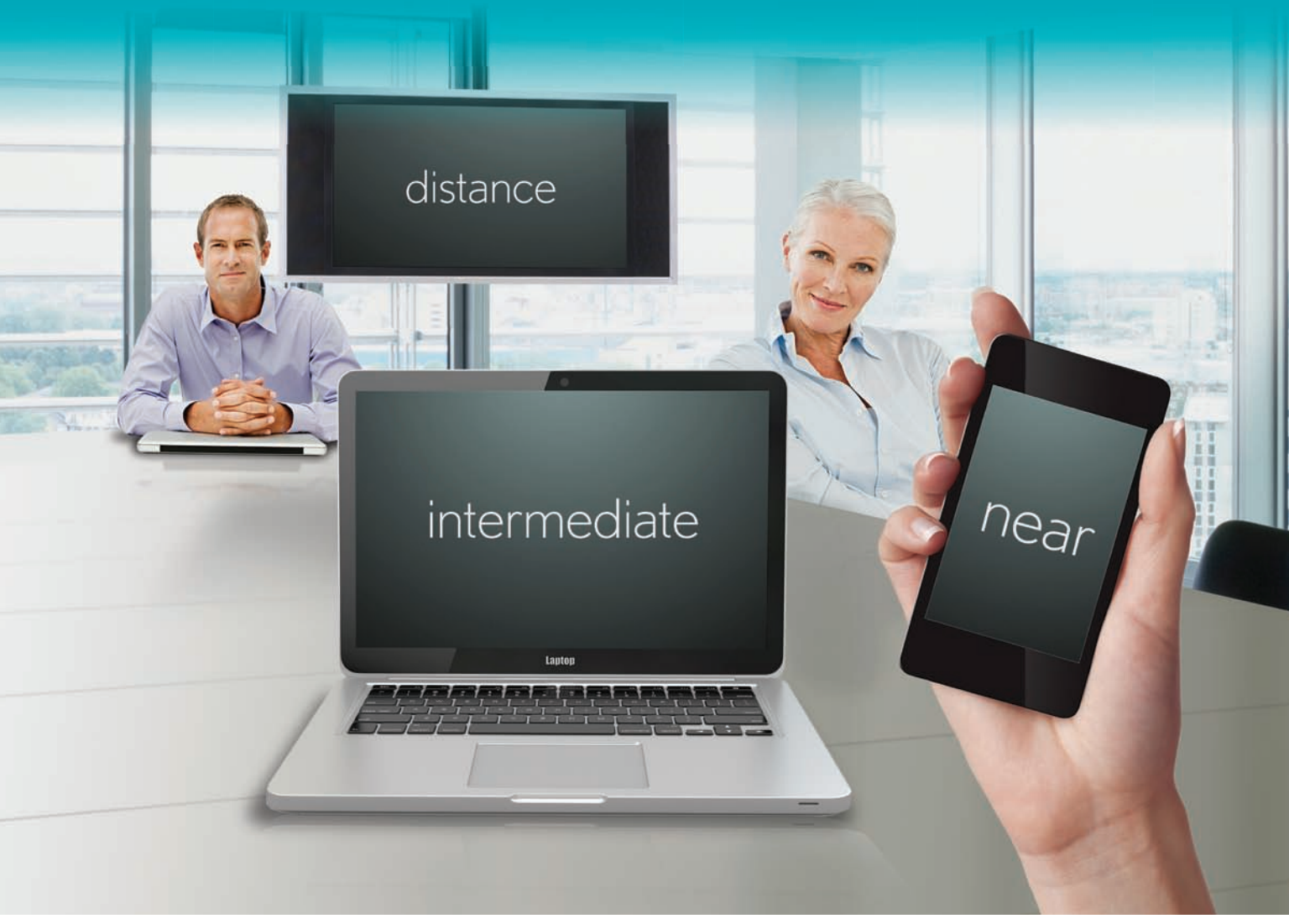

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Edited by Joseph J. Pizzimenti, OD, and Carlo J. Pelino, OD

ALS: Beyond the Bucket

The Ice Bucket Challenge was a sobering reminder of the deleterious effects of amyotrophic lateral sclerosis. By Zachary L. Olsen, OD, and William J. Denton, OD

Amyotrophic lateral sclerosis (ALS)—often referred to as Lou Gehrig's disease—is a devastating neurodegenerative disease characterized by the loss of cortical, brainstem and spinal motor neurons. The upper and lower motor neurons degenerate or die, disconnecting the communication between the neurons, resulting in progressive muscle weakening and the appearance of fasciculations, or twitching.

Although some patients present with a much slower disease progression, the average period from the onset of symptoms to quadriplegic status is approximately three to five years.

We know there should be no autonomic, sensory or cognitive involvement in ALS.[1] However, in the later disease stages, up to 50% of ALS patients show cognitive impairment, particularly implicating more severe executive dysfunction and mild memory decline.[2]

Ocular Involvement

Ocular motor function is largely preserved in ALS. But some evidence shows ocular motor dysfunction in certain individuals diagnosed with ALS occurs in much later stages of the disease.[2] The literature is far from rich in ocular symptoms of ALS patients, but ophthalmoplegia was first described in 1925. Although naturally evident in the elderly population, earlier abnormal pursuit has also been described. [2]

The literature has also shown slowed and inaccurate saccadic movements, especially in the vertical orientation. Individuals with ALS demonstrate an increased error rate and latency to stimuli presented quickly and peripherally. Researchers have also reported horizontal and rotatory gaze-evoked nystagmus.[2]

Vision Demand

Many ALS patients have a special computer-based system that monitors their corneal reflex with an infrared (IR) device. When the patient looks at a letter on their computer keyboard display with both eyes, the IR sensor processes the letter as "typed." You may see symptoms of computer vision syndrome in these patients. Presbyopia, ocular surface disease and eyestrain, among others, can incorporate many of the symptoms, like headaches, neck/shoulder pain and blurred vision. More importantly, the IR sensor does not work with a dry ocular surface and is unforgiving, with blinks interrupting a computer command. As a result, ALS patients—with their high visual demands—tend to have partial and reduced blink rate with a resultant ocular dryness.

As the eye doctor, you should recommend control of lighting and screen glare, maintaining proper working distance and posture for computer viewing, avoiding direct air flow and increasing room humidity, and addressing even minor refractive error, including presbyopic needs.

In addition, treat symptoms as they present, including the use of ocular lubricants and abiding by the 20/20/20 rule: taking at least 20 seconds to look at least 20 feet in the distance after every 20 minutes of computer use. Close observation and knowledge of the patient's life may demand some creative ways to provide successful treatment.

An Eye on Research

Compared to limb muscles, extraocular muscle (EOM) function is typically well preserved in ALS patients, but is affected in the terminal phase of the disease regardless of type and site of onset. In limb muscles of adults, there can be loss of up to 80% of muscle mass and atrophy of individual muscle fibers as a result of denervation.[3] The EOMs likely react differently to denervation because they actually show preservation of the muscle fibers.[3] The difference in muscle cell communication in EOM and limb muscle suggests a major role in the pathophysiology of ALS.[4]

Epidemiology

ALS is one of the most common motor neuron degenerative diseases and typically affects adults during midlife, with a median age onset of 60 years.[5] Early clinical manifestations of ALS appear gradually over several years. The overall incidence of ALS is about three people per 100,000 a year.[6]

Diagnostic Considerations

Diagnosis of ALS is challenging because many motor neuron diseases share similar symptoms, indicating a functional loss of upper and/or lower motor neurons.[7] Electrodiagnostic testing, imaging, laboratory testing and other procedures are necessary to categorize a patient as having a neuromuscular disease. The diagnosis of ALS is largely dependent on differentiation between these diseases and what symptoms are present.

A Pause for Cause

While the pathogenesis of ALS is unknown, evidence suggests excessive stimulation of the motor nerve cells by the neurotransmitter glutamate damages and destroys them, which may play an important role in the disease.[6] Histopathological studies have revealed foreign deposits within surviving motor neurons, extensive gliosis and the presence of extensive neuronal loss or atrophy. [7]

Environmental risk factors and causes of ALS are considered controversial; however, there is significant literature linking the disease to welding and soldering, inhalation of lead vapor, agricultural chemical exposure and electrical trauma. The most common associations are age (between 50 and 80 years), sex (1.5x greater in males) and physical injury, which may explain the higher incidence in men.[6]

Treatment

There is no cure for ALS at this time. The best treatment for the patient is to maintain independence through comprehensive and holistic care. The only disease-specific treatment currently available is the neuroprotective agent Rilutek (riluzole, Sanofi-Aventis), which was shown to slow the rate of muscle strength deterioration and increase the survival rate of the individual.[9] ■

Dr. Olsen is the current Resident at the Ralph H. Johnson VAMC in Charleston, SC. Dr. Denton is his Residency Director.

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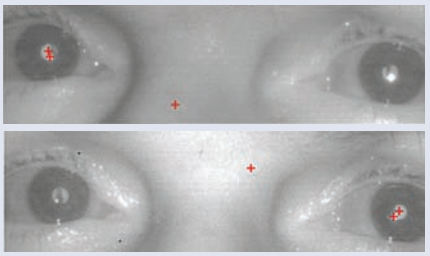
To learn more about the clinical manifestations and diagnosis of ALS, look for an enhanced version of this article at www.reviewofoptometry.com.

Case Report: A New 'Type' of Life

We recently had the pleasure of a patient with ALS in our clinic who changed our perspective on this disease. Our patient is a 55-year-old white male veteran who presented as a low vision patient, with his last dilation performed approximately a year ago.



Our patient types using infrared (IR) eye-tracking software (Tobii). The red crosses indicate that the IR system recognizes his eye when it is found in the pupil.

He was diagnosed with ALS more than seven years prior and stated his complaints through the following printout that he prepared for us:

"These are photos of my eyes taken in IR. Tobii's concern is the shadows on the pupils of the eyes. They are saying that even though the shadows aren't consistent, they could disrupt the algorithms that track my eyes. Is there any medical cause for the shadows?"

The patient has quadriplegia. He travels in a motorized wheelchair that he cannot operate and depends on his wife and home care nurse to suction his saliva every 10 minutes since he cannot swallow. A ventilator provides him the ability to breathe. In limited observation, it appears he has full EOM range of motion, but only limited facial muscle function. All other muscles appear paralyzed.

He was an IT guru prior to his health-related tangent. He has his own email and Facebook accounts, and even created his own YouTube channel. It's quite obvious from his chief complaint that he is cognitively present, despite what his appearance may present.

His diagnosis was computer vision syndrome and presbyopia. These are easy to fix for the average patient, but ALS made things more difficult. The end result was a patient with better understanding of the importance of blinking, need for artificial tears and humidity control. A proper spectacle correction would allow for sharper vision, but there were a few hurdles due to his desire to see both far and near without the ability to move his neck, but just his eyes.

Here is what the patient wrote after his treatment:

"Many ALS patients rely on their eyes for communication and [spouse's name] and I have always felt that as long as I can communicate, I will stick around. Your work is literally saving my life and allowing me to have a reasonable quality of life. Thank you for that."

You Deserve Special Treatment

Our patient presented with a fairly obvious macular pathology. But, what management protocol is most appropriate for her? **By Mark T. Dunbar, OD**

A 79-year-old Hispanic female presented with blurred vision and a visual "gray spot" in her left eye. She reported that the spot appeared fairly suddenly in her central vision, but she believed that it would improve. When it didn't, she decided to seek a medical opinion.

Her ocular history was remarkable for cataract surgery OU about 10 years earlier. She noted excellent vision in both eyes until approximately three months ago. She reported no visual problems OD.

Her medical history was significant for hypertension and a heart condition, which were controlled with digoxin, Crestor (rosuvastatin calcium, AstraZeneca), nifedipine and hydrochlorothiazide.

On examination, her best-corrected visual acuity measured 20/20 OD and 20/60 OS. Extraocular motility testing was normal. Confrontation visual fields were full to careful finger counting OU. Her pupils were equally round and reactive, with no evidence of afferent defect OU. Amsler grid testing of the right eye was normal; however, the left eye exhibited central metamorphopsia. Her anterior segment exam revealed well-centered posterior segment IOLs OU.

Dilated fundus exam showed a small cup with good rim coloration and perfusion OU. We noted obvious macular pathologies in both eyes (*figures 1 and 2*). The left eye, in particular, showed elevation and other significant changes. Additionally, we obtained a spectral-domain optical coherence tomography (SD-OCT) scan OS (*figure 3*).

Take the Retina Quiz

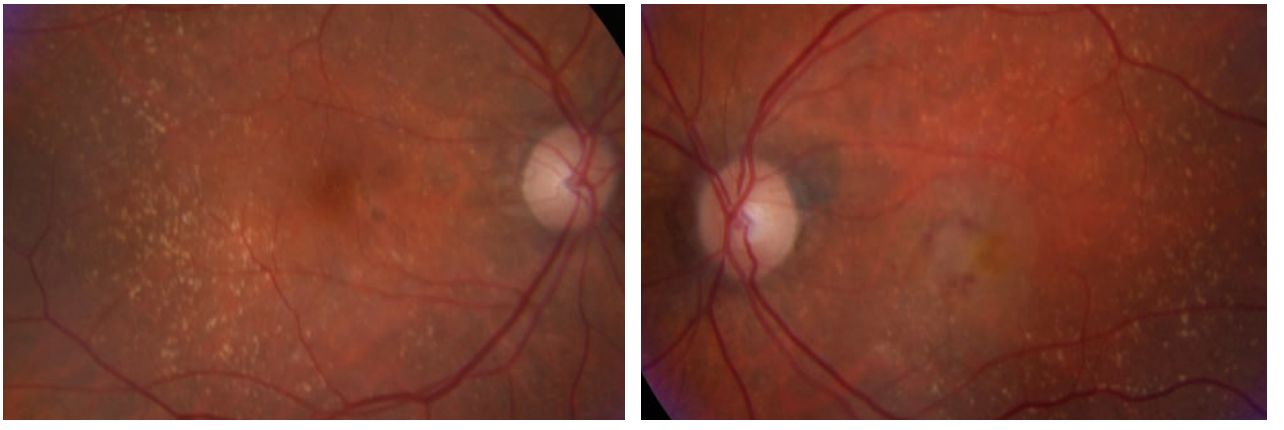
1. What do the focal white deposits in both maculae represent?
   a. Drusen.
   b. Exudate.
   c. Retinal crystals.
   d. Dalen-Fuchs nodules.

2. What does the area of elevation seen on SD-OCT represent?
   a. Choroidal mass.
   b. Hemorrhagic pigment epithelial detachment (PED).
   c. Serous PED.
   d. Large choroidal neovascularization (CNV).

3. What is the likely diagnosis?
   a. Choroidal hemangioma.
   b. Wet age-related macular degeneration (AMD).
   c. Central serous chorioretinopathy.
   d. Retinal angiomatous proliferation.

4. How should she be managed?
   a. Observation.
   b. Thermal laser treatment.
   c. Photodynamic therapy (PDT).
   d. Anti-VEGF injection.

5. What is the likely long-term management protocol for this case?
   a. Continued observation.
   b. Monthly anti-VEGF injections.
   c. Anti-VEGF injections, as needed.
   d. PDT and laser, as needed.



1, 2. Fundus examination of our patient (OD left, OS right). What changes do you note in her left eye?

PROGRESSIVE LENS TECHNOLOGY AT ITS BEST

A commitment to technology and premium products is essential for patient satisfaction and a strong practice.

Generally speaking, people visit their optometrists so they can see better in their day-to-day lives. For presbyopes, that can sometimes be a tall order—especially for those who wear progressive lenses. But that's exactly why it's important not to compromise on lens selection or quality of products.

Nobody knows this better than optometrist Keith Smithson. He's been in practice at Northern Virginia Doctors of Optometry since he graduated from optometry school 14 years ago. He says the practice is committed to delivering premium care through the use of premium products and technology to provide the most exceptional patient experience possible.

Here Dr. Smithson explains how this commitment ensures the satisfaction of its progressive-wearing presbyopic population and, in turn, leads to a strong practice.

THE POWER OF PRESCRIBING

"We believe in doctor-driven dispensing," says Dr. Smithson. He explains, "We start our discussion with progressive lens wearers in the exam room, where we listen to the patient and understand his needs. We also prescribe from the exam room before walking the patient out to the dispensary and sitting down with them and the optician." At that point, Dr. Smithson says, as a team, the three of them review what the doctor feels is the best option for the patient and why. "This makes for an effective transition, and patients understand that this is my prescribed remedy, not a recommendation," he adds.

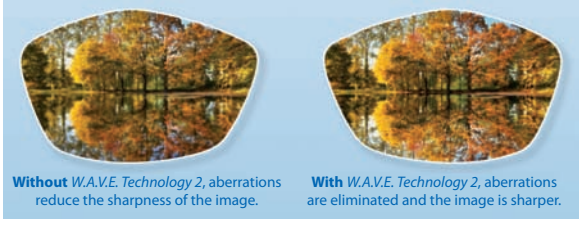
He emphasizes the importance of listening to patients to determine what they're asking for and what they really need in order to customize their results. He says, "Someone who's trying to drive at night or perform well in the office wants visual performance, so we discuss what we feel are the best products and technology out there." He adds, "In my opinion—and it's pretty well documented in our practice—Essilor's Varilux S Series™ lenses are the premium in technology right now."

AN INFORMED PATIENT IS A HAPPY PATIENT

Of the practice's 11 doctors and 50-some staff members, those who are of "progressives age"—including Dr. Smithson—do wear Varilux® lenses with W.A.V.E. Technology 2™. These doctors and staffers can truly explain the technology because they believe in it, and patients see that. "It's not a sales pitch at that point, rather, it's an education process," says Dr. Smithson.

In fact, education is of huge importance in his practice. As far as discussing the technology behind the lenses he prescribes, Dr. Smithson says he uses the word "high definition" a lot because patients understand what that means. He explains to them that *W.A.V.E. Technology 2* is a way of creating more high-definition optics in varying lighting conditions and that it identifies and eliminates wavefront aberrations and distortion on the lens, giving them the sharp vision they desire.

It's no wonder *W.A.V.E. Technology 2* has become a selling point for many of Dr. Smithson's patients, as he says most progressive wearers tend to complain about being unable to see in low lighting conditions. Taking the opportunity to educate these patients, he describes how dim light conditions cause the pupil to enlarge, allowing a larger beam of light through a larger surface of the lens, thereby diminishing sharpness. He then explains that *W.A.V.E. Technology 2* customizes the lens design to the patient's changing pupil size so patients can have sharp, consistent vision—even in low light conditions.



Without *W.A.V.E. Technology 2*, aberrations reduce the sharpness of the image.

With *W.A.V.E. Technology 2*, aberrations are eliminated and the image is sharper.

Inevitably, finances will come into question from time to time. Dr. Smithson admits that some patients will ask why the lens he's prescribing costs more at his practice than the ones prescribed at a chain retailer. He refers to the high-definition technology they previously discussed and points out that it's not available with other products. "I tell these patients that I'm prescribing something that I know is going to meet their needs and explain why lens designs that they might get inexpensively elsewhere are going to leave them short of their expectations."

THE FOUNDATION OF A GOOD PROGRESSIVE PRACTICE

Dr. Smithson says that the adaptability of *Varilux* lenses is a huge upside, especially for those who were unable to wear progressives previously. "These patients also tend to experience better vision than they have with any progressive they've worn before, thanks to the *W.A.V.E. Technology 2*," he says. "It's also great for returning patients because they know that we spent the time with them and delivered the products and the results." He also admits that this sets the stage for future word-of-mouth referrals.

"We believe in Essilor and its family of products," declares Dr. Smithson, adding that building a good practice starts with understanding the products and educating patients in the exam room. "It also includes not compromising on technology, promoting the best products at your disposal and delivering on results." Simple enough for anyone to follow.

Dr. Smithson practices at two of Northern Virginia Doctors of Optometry's four practice locations in the Washington, D.C., metro area. He is also the team optometrist for the Washington Wizards, Washington Nationals and DC United.

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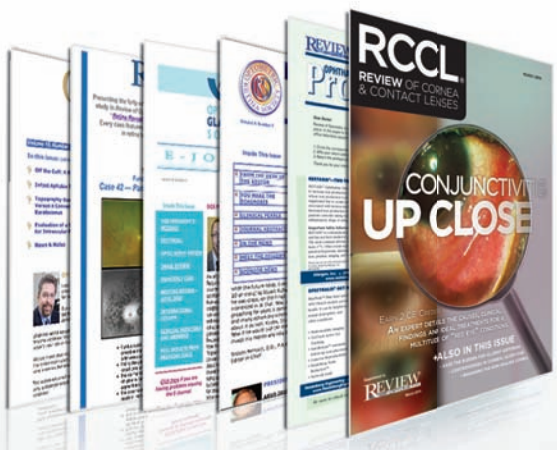

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For answers, turn to page 90.

Discussion

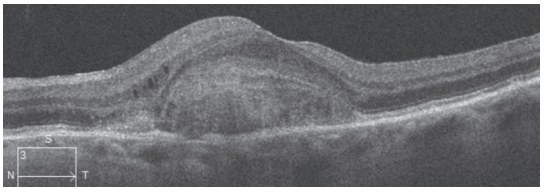
The small focal deposits scattered throughout both posterior poles represent drusen. Based on these changes alone, our patient has macular degeneration. Additionally, she has converted from dry to wet AMD in her left eye.

There is an obvious subretinal hemorrhage surrounding a focal elevation in the left fovea that appeared to be a retinal pigment epithelial detachment. Considering the lesion's central location and three-month duration, her visual acuity actually is quite good.

Her SD-OCT scan proved very interesting. There is an obvious focal area of elevation involving the macula. This appears to originate from a highly reflective, dome-shaped mass located just above the retinal pigment epithelium (RPE). The initial clinical impression was that the elevation represented a PED. But, based on the SD-OCT scan, the RPE is fairly intact—so it doesn't appear to be a PED.

Instead, the reflective area likely represents a vascular meshwork of choroidal neovascularization that is growing above (or anterior to) the RPE. The elliptical zone (formerly known as the photoreceptor integrity line or the inner segment/outer segment junction) seems to be fairly intact, except near the lesion's apex. This explains why her vision isn't significantly compromised OS.

The treatment for wet AMD has evolved considerably over the past decade. Intravitreal anti-VEGF therapy has revolutionized the management of neovascular AMD. Available medications include ranibizumab, bevacizumab and aflibercept. All three agents demonstrate tremendous efficacy in treating CNV; however, specific treatment selection usually is dictated by physician preference and/or economic considerations (bevacizumab is profoundly less expensive than either ranibizumab or aflibercept).



3. A spectral-domain optical coherence tomography scan through the macula of our patient's left eye.

The majority of clinical trials have shown that monthly injections are slightly more effective than PRN treatment, although the clinical differences between a monthly and PRN injection schedule are not statistically significant. The primary advantage of PRN therapy is reduced treatment frequency during the first year (i.e., roughly six or seven injections vs. 10 or 11 injections).[1] Further, PRN treatment yields clear economic advantages and improved patient tolerance.

Treat and extend (TREX) management is now employed by approximately 77% of retinal specialists in the US.[2] With this protocol, patients are treated during each visit, regardless of disease activity. If there is no sign of exudation, the treatment intervals are extended gradually by one to two weeks. When there are signs of disease recurrence, the intervals are shortened. The shortest interval between injections is four weeks, and the longest interval is up to 12 weeks.

The fundamental goal of TREX is to maintain an exudation-free macula using the fewest injections possible.[2,3] Ideally, this approach will reduce treatment costs to insurance companies, health care providers and patients.

To date, the Lucentis Compared to Avastin Study (LUCAS) is the largest prospective trial to evaluate the clinical efficacy of the TREX protocol.[3] The researchers randomized 420 Norwegian patients with wet AMD to receive either ranibizumab or bevacizumab injections for up to one year. Subjects in the ranibizumab group received an average of 8.0 injections compared to 8.8 injections in the bevacizumab group.[3] At one year, both agents performed equally well, with patients in the ranibizumab group gaining 8.2 ETDRS letters vs. 8.0 letters in the bevacizumab group.[3] Two other prospective clinical trials evaluating the TREX approach are also underway in the US.[4,5]

Our patient received an intravitreal bevacizumab injection and was instructed to return in four weeks. At the four-week follow-up, she still exhibited considerable exudation and macular edema, so we ordered a second injection. She was then scheduled to return in another four weeks.

If the exudation has resolved, she will receive third injection and the follow-up period will be extended to six weeks. ■

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Ocular Urban Legends

We've heard about these presentations, but have yet to actually see them.

By Joseph W. Sowka, OD, and Alan G. Kabat, OD

During our training and clinical careers—now spanning approximately 30 years—we have heard or read about a number of seemingly rare ocular events. In some cases, we've even taught them to our students and residents.

Being honest, we learned about some of these events from our professors—but often have not stopped to think if we have actually seen them ourselves. This leads us to wonder if these occurrences are real or merely urban legends propagated through time.

This month we shine a light on some of these possible "ocular urban legends."

Changing Parapapillary Atrophy?

We have long known that the optic disc goes through a number of characteristic changes in glaucoma. Focal rim damage, optic disc hemorrhages and loss of retinal nerve fiber layer (RNFL) all occur throughout glaucoma progression. We also know that parapapillary atrophy is associated with glaucoma—especially when occurring in the beta zone.[1]

Disc hemorrhages occur more frequently in eyes with parapapillary atrophy, and usually in the area of greatest atrophy width.[2] We also know that eyes with zone beta parapapillary atrophy experience more significant and faster RNFL thinning, as well as faster glaucomatous progression, than those without this atrophy.[3-5]

The question arises: Does parapapillary atrophy change in glaucoma, and if so, is it a sign of disease progression? One large, population-based study in China showed that the five-year progression rate of zone beta parapapillary atrophy was 8.2%, and was significantly correlated with higher IOP, greater myopic refractive error and increased central corneal thickness, and occurred more commonly in glaucomatous eyes.[6]

Another research group noted that advancement of parapapillary atrophy occurred prior to optic disc or visual field change in some eyes with ocular hypertension, and may be an early finding in conversion to glaucoma.[7]

A separate team identified anatomic changes in parapapillary atrophy, but noted that detection was lower using standard ocular photos compared to alternation flicker technique (MatchedFlicker, EyeIc, Inc.).[8]

One additional group reported that zone beta parapapillary atrophy does enlarge in glaucomatous eyes, but occurs very infrequently.[9] They noted that this change occurs more often in patients with progressive glaucoma than in those with non-progressive glaucoma. They believed that due to low frequency, enlargement of zone beta may not be a very useful marker for glaucoma progression.[9]

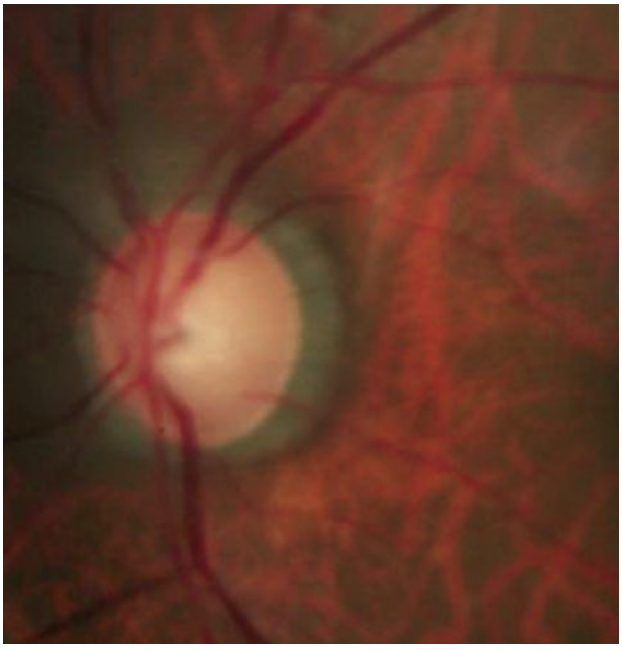
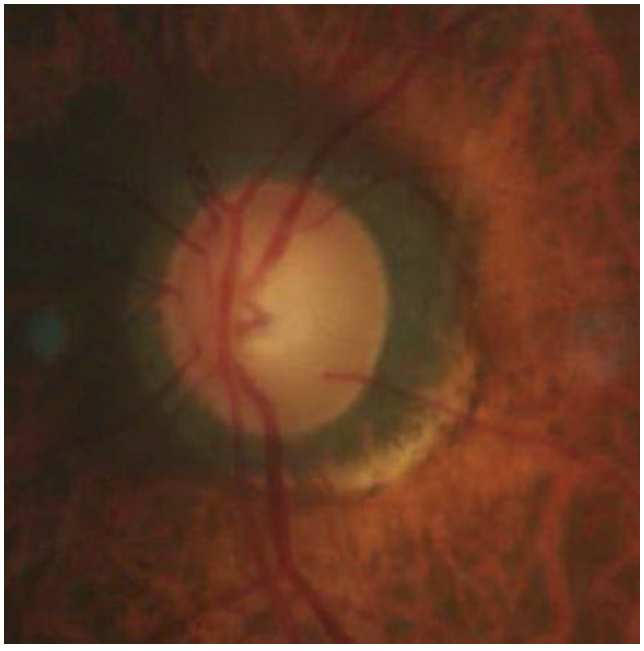
Our thoughts? We'll believe it when we see it.

The patient is a 63-year-old male treated for primary open-angle glaucoma since 2009. While his visual field and optic disc have not changed in either eye, his left eye shows a clear change in parapapillary atrophy. Because there is no consensus whether changing parapapillary atrophy is a sign of disease progression, we have not altered his therapy. We are following his corresponding visual field and optic disc photos (*at right*) very carefully to see if they do change, before amplifying therapy.

Does Lens Removal Solve Pseudoexfoliation Syndrome?

Pseudoexfoliation presents as a fine, flaky material on the anterior lens capsule. Over time, this will coalesce into a characteristic "bulls-eye" pattern typically seen in pseudoexfoliation syndrome and glaucoma. Initially, intraocular pressure is unaffected in pseudoexfoliation syndrome; however, elevated IOP can develop in conjunction with glaucomatous cupping and visual field loss.

Pseudoexfoliation involves the production and accumulation of an abnormal fibrillar extracellular material within the anterior chamber of the eye. It appears that the material is comprised of abnormal basement membrane secreted by all structures within the anterior chamber, and is deposited on the anterior lens capsule, iris surface and trabecular meshwork.[10,11] Due to accumulation of material at the pupillary

Our 63-year-old patient who exhibited parapapillary advancement over a five-year period in the left eye only (baseline examination left, five-year follow-up evaluation right).

margin, there is increased lenticular apposition with the iris and subsequent erosion of iris pigment as the pupil dilates and constricts.

The development of glaucoma typically occurs secondary to a buildup of pigment granules and exfoliative material within the trabecular meshwork. The primary cause of IOP elevation appears to be phagocytosis of accumulated pigment and material by the trabecular cells and Schlemm's canal cells, with subsequent degenerative changes of Schlemm's canal and the trabecular meshwork tissues.

The question arises: Does pseudoexfoliative material deposit on the intraocular lens or anterior capsule after cataract surgery? One research group noted this phenomenon to be a rare event, occurring in seven cases two to 20 years after lens removal.[12] A second research team reported four cases in which pseudoexfoliative material deposited on the IOLs, with subsequent glaucoma development more than eight years after cataract surgery.[13] Another group detailed a differing appearance in pseudoexfoliation deposition on the IOL surface, noting that the central homogenous zone is not present and that the material only deposits on the periphery of the IOL.[14]

Again, we'll believe it when we see it.

The patient is a 75-year-old female who was treated for pseudoexfoliative glaucoma. She lives in the Bahamas and receives care there as well as here when she visits the US. She had visually significant cataracts at her last visit here 19 months ago. Prior to her return in 2014, she underwent cataract surgery in the Bahamas. At her most recent examination, we could clearly see pseudoexfoliative material on both the anterior lens capsule and the IOL. Thus, removing the lens did not solve pseudoexfoliation syndrome.

Does Exercise Cause IOP Spikes in PDS?

Patients with pigment dispersion syndrome (PDS) and pigmentary glaucoma demonstrate iris pigment liberation within the anterior chamber. The IOP rise in pigmentary glaucoma mostly occurs due to a breakdown of normal phagocytic activity in the endothelial cells and subsequent loss of normal trabecular architecture and function—not secondary to physical blockade of the meshwork.[15]

However, we have long heard tales of young PDS patients experiencing transiently blurred vision after exercising, presumably due to pigment liberation causing an IOP spike and resultant corneal edema. But does this really occur?

It appears that our understanding of this phenomenon comes from a single case reported in 1980.[16] Another study group tried to recreate this phenomenon using a controlled exercise protocol involv-

ing 10 patients with PDS. While the researchers noted a minimal increase in both pigment liberation and IOP elevation 15 minutes after exercise, the pressures returned to baseline within 30 minutes.[17] Two additional research teams noted that pigment liberation could be increased in patients with PDS after jogging and bicycling, but with no significant impact on IOP.[18,19]

One more time—we'll believe it when we see it. And, for the record, we have never witnessed this phenomenon. Anecdotally, we have several academic colleagues who have tried to induce IOP elevation in their PDS patients to no avail. Thus, we don't consider patients with PDS or pigmentary glaucoma to be precluded from exercise.

Indeed, there are phenomena that we have learned about but have never seen. While some may be rare events that do occur, others may just fall into the category of "urban legend." Sometimes you don't believe it until you see it. ■

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VEGF Trap-eye Snares DME

Eylea provides a longer duration of effect for diabetic macular edema patients than other anti-VEGF options. **By Diana L. Schectman, OD, and Paul M. Karpecki, OD**

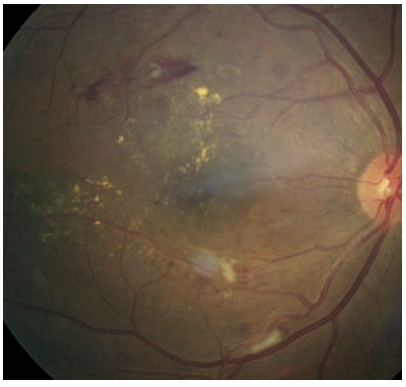
Eylea (aflibercept, Regeneron Pharmaceuticals), also known as "VEGF Trap-eye," highly binds to its receptor while maintaining a slow degradation process, potentially yielding a longer duration of effect than other anti-VEGF agents. Researchers have already proven that Eylea is effective for the treatment of wet AMD and macular edema associated with retinal vein occlusion.[1-6]

Diabetic macular edema (DME) is the leading cause of blindness among our working adult patients. Anti-VEGF therapy provides visual improvement for many of our DME patients. However, the need for frequent follow-up and retreatment poses several potential disadvantages.

Fortunately, Eylea shows tremendous promise for vision restoration and decreased dosing intervals for DME patients. We await publication of the two-year results to further evaluate its efficacy and safety.

In July 2014, Eylea secured FDA approval for the treatment of DME following publication of two global clinical trials—VISTA and VIVID.[7,8] In these one-year trials, researchers evaluated the efficacy and safety of Eylea at variable dosing schedules compared to conventional macular photocoagulation for the treatment of centrally involved DME.[7-10]

Approximately 460 patients in the US participated in the VISTA-DME study, and 400 patients from countries outside the US participated in the VIVID-DME study.[7-10] Patients in both studies were randomized into one of three subgroups (two treatment groups and one control group). Patients in the first treatment group received monthly Eylea injections and patients in the second treatment group received Eylea injections every two months following five initial monthly doses. Those in the control group received photocoagulation therapy.



Diabetic macular edema detected upon dilated fundus exam.

In both studies, the primary endpoint was improvement from initial best-corrected visual acuity using the ETDRS scale chart. Secondary endpoints included:

- The number of patients who gained ≥10 to 15 ETDRS letters from baseline.
- The number of patients with a ≥

A Bird's-eye View of Anti-VEGF

Diabetic macular edema (DME) is a complex, multifactorial disease associated with a hypoxic environment, as well as vasculature alteration. Hypoxia leads to increased levels of vascular endothelial growth factor (VEGF), which increases inflammation and permeability. This complex cascade may lead to extracellular leakage near or within the macula that eventually manifests as macular edema.

Focal/grid laser photocoagulation remains a potential treatment option for patients with DME, but anti-VEGF therapy now is the gold standard. In some instances, conventional laser may be combined with anti-VEGF treatment. The choice between Eylea, another anti-VEGF drug or laser is up to the retina specialist.

VEGF plays a critical role in the development of macular edema, and high levels of VEGF have been found in the aqueous humor of patients with DME.[11,12] Anti-VEGF blocks proteins that cause neovascularization and DME development.[13]

Researchers have shown that both Lucentis (ranibizumab, Genentech/Roche) and off-label use of Avastin (bevacizumab, Genentech/Roche) are safe and effective treatment options for patients with wet AMD.[11,12,14] Recent clinical data also suggest comparable efficacy between Lucentis and Avastin in the treatment of DME.[14]

Yet, one of the main limitations of both drugs is the need for frequent retreatment to maintain optimal vision during the course of the disease. Thus, researchers have studied newer treatment options, such as Eylea, to help diminish this burden by increasing the therapeutic duration and efficacy.

two-line improvement from baseline.

- Change in central retinal thickness from baseline (assessed via SD-OCT).
- Change in visual function from baseline (as assessed by the National Eye Institute's Visual Functioning Questionnaire-25 activities subscale).

VISTA and VIVID Results

After one year, visual acuity in the treatment groups in both studies showed robust, statistically significant improvement compared to the control groups.[10] Patients in both treated groups consistently gained an average of two additional lines of visual acuity, compared to no negligible change in the control groups.

Overall, patients tolerated Eylea well. Patients in the treated groups experienced a similar incidence of adverse events. The most common ocular side effects included conjunctival hemorrhage, vitreous floaters and eye pain. The safety and tolerance profiles were similar to those previously reported in the literature for the use of Eylea for the treatment of wet AMD and macular edema associated with central retinal vein occlusion.[1,2,4,5] ■

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Diagnostic Equipment

See, and Share, Images Better

Topcon recently announced several new diagnostic devices, including the following:

• ***KR-800S.*** This Auto Kerato/Refractometer boasts auto-refraction and subjective visual acuity testing that could help you comanage patients with poor night vision or who have cataracts, the company says. The glare testing function allows assessment of patients' visual acuity even in the presence of glare.

• ***TRC-NW8F Plus.*** This new camera has multiple functions, including automatic focus and capture. Autoblink and small-pupil features prevent mistakes, Topcon says. The 16.2 megapixel camera produces red-free high-resolution images.

The device includes a Spaide fundus autofluorescence filter exclusive to Topcon. You can also upgrade the platform to perform fluorescein angiography. The camera works with Topcon's ImageNet 5 capture system to manage photos.

• ***Synergy ODM Version 4.0.*** To simplify image and clinical data transfer across devices, Topcon has revamped its Synergy ophthalmic data management system. Like its predecessor, the latest version manages images and reports from roughly 130 devices (from both Topcon and others), integrates with most electronic medical record systems and comes standards compliant.

Synergy's newest functions include line, area and cup-to-disc measurement, automated refractive data importing, statistical analysis reports, multiple image export, enhanced compare mode features and DICOM OPT image support.

Visit www.topconmedical.com.

Transpalpebral Tonometer

The new Diaton tonometer from Escalon Medical measures intraocular pressure through the eyelid without touching the cornea or using topical anesthesia. The pen-like device can assist you with difficult patients such as children or those contraindicated for direct applanation tonometry, such as people with corneal pathologies, edema, infections, past corneal surgery, recent Boston keratoprosthesis implantation or those with past eye trauma, the manufacturer says. Other advantages include:

- Reduced risk of infecting or scratching the cornea
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Dispensing

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The Roto-Max Island allows you to stock and sell more eyewear in a smaller space, according to manufacturer Fashion Optical Displays. The rotating display holds 324 pairs in only two sq. ft. of space. The top displays 72 frames and the taboret base stores the rest.

You can customize the island with a variety of hardwoods or laminates based on the style of your dispensary, the company says.

Visit www.fashionoptical.com. ■

Nutrition

Quick-dissolving Vitamin Strips for Macular Health

Patients may be more compliant with taking their vitamins if they dissolve quickly on the tongue. MacuStrips (Macular Health), the first dissolving vitamin strip nutraceutical for macular health, contain the same vitamins found in pills that retard the progression of age-related macular degeneration, says the manufacturer. For aging patients, the mint-flavored dissolvable strips could be easier than swallowing big pills and may reduce the gastric complaints they cause. The strips also deliver an exact dosage of medication, minimizing the chances of incorrect patient self-dosing, the manufacturer says.

A one-month supply costs less than $1 a day and is available now in the US and internationally.

Visit www.macularhealth.com.

November 2014

■ **13-15.** *NCSOS Fall Congress.* The Grove Park Inn, Asheville, NC. Hosted by: North Carolina State Optometric Society. CE hours: 18. Email Adrianne Drollette at adrianne@nceyes.org or call (252) 237-6197. Visit www.nceyes.org.

■ **16.** *VOSH International Meeting: Embracing Traditions, Expanding Horizons.* Embassy Suites Downtown, Denver, Colo. Hosted by: Volunteer Optometric Services to Humanity (VOSH). To register, visit www.vosh.org.

December 2014

■ **6-7.** *31st Annual Cornea, Contact Lens & Contemporary Vision Care Symposium.* The Westin Memorial City. Houston, Texas. Hosted by: University of Houston College of Optometry. CE Hours: 16. Key Faculty: Ralph Stone, OD. Email Amanda Johnson at ajohnson@optometry.uh.edu or call (713) 743-1900.

February 2015

■ **6-8.** *2015 PBCOA Winter Seminar.* PGA National Resort & Spa, Palm Beach Gardens, FL. Hosted by: Palm Beach County Optometric Association. CE hours: 20. Key faculty: Carl Pelino, OD and Kimberly Reed, OD. To register, go to: www.pbcoa.org.

■ **13-15.** *54th Annual Contact Lens and Primary Care Congress.* Sheraton Kansas City Hotel at Crown Center. Kansas City, Mo. Hosted by: Heart of America Contact Lens Society. To register, go to www.hoacis.org.

■ **13-17.** *Ski Vision 2015.* Westin Snowmass Luxury Resort. Snowmass Village, Co. Hosted by: AAO and UABSO. CE hours: 20. Key faculty: Murray Fingeret, OD, Leo Semes, OD, Jack Schaeffer, OD, Jack Cioffi, MD, David Friedman, MD, PhD, and more. To register, go to http://skivision.com.

■ **19-22.** *115th TOA Annual Convention.* Downtown Austin Hilton Hotel, Austin. Hosted by: Texas Optometric Association. CE hours: 27. Key faculty: Ian Ben Gaddie, OD, FAAO, Steven Ferucci, OD, FAAO and Diana Shechtman, OD, FAAO. To register, call Sherry Balance at (512) 707-2020 or email sherry@txeyedoctors.com.

■ **20-21.** *2015 Winter Conference.* Grand Summit Hotel Sugarloaf, USA, Carrabassett Valley, ME. Hosted by: Maine Optometric Association. To register, call (207) 237-2000.

■ **26-28.** *Montana Optometric Association Winter Education Symposium Big Sky 2015.* Big Sky Resort, Big Sky, MT. Hosted by: Montana Optometric Association. CE hours: 13. Key faculty: Bruce Onofrey, OD, RPh, FAAO, FOGS; Curtis R. Baxstrom, OD. To register, go to www.mteyes.com.

March 2015

■ **4-8.** *SECO 2015.* Georgia World Congress Center, Atlanta, Ga. Hosted by: SECO. To register, go to: www.seco2015.com.

■ **20-22.** *Vision Expo East.* Jacob K. Javits Convention Center. New York, New York. Hosted by: International Vision Expo and Conference. To register, go to www.visionexpoeast.com.

■ **26-28.** *OAOP Vision Summit.* Embassy Suites Hotel and Conference Center. Norman, OK. Hosted by: Oklahoma Association of Optometric Physicians. CE hours: 18. To register, go to www.oaop.org.

April 2015

■ **15-17.** *World Cornea Congress VII.* San Diego Convention Center, San Diego, CA. Hosted by: ASCRS. To register, go to: http://corneacongress.org.

■ **17-19.** *NOA Spring Conference-CE Event.* Embassy Suites, Lincoln, NE. Hosted by: Nebraska Optometric Association. To register, call Alissa Johnson, CAE, at (402) 474-7716 or email ajohnson@assocoffice.net.

■ **17-22.** *ASCRS-ASOA Symposium and Congress 2015.* San Diego Convention Center, San Diego, CA. Hosted by: ASCRS/ASOA. To register, go to: http://annualmeeting.ascrs.org/

■ **23-26.** *2015 Annual Spring Convention.* Marriott Hotel & Little Rock Convention Center, Little Rock, AR. Hosted by: Arkansas Optometric Association. To register, email Vicki Farmer at vicki@arkansasoptometric .org.

■ **29-May 7.** *Annual Educational Conference and Exposition.* Red Lion Colonial Hotel, Helena, MT. Hosted by: Montana Optometric Association. To register, call (406) 443-1160 or email sweingartner@rmsmanagement.com.

■ **30-May 1.** *Spring 2015 Convention. Pierre Ramkota, Pierre, South Dakota.* Hosted by: South Dakota Optometric Society. To register, email Deb Mortenson at deb.mortenson@pie.midco.net..

May 2015

■ 2-3. *8th Annual Evidence Based Care in Optometry Conference.* Turf Valley Conference Center and Resort, Ellicott City, MD. Hosted by: Maryland Optometric Association & John Hopkins-Wilmer Eye Institute. To register, call Annie Phan at (410) 486-9662 or email aphan@marylandoptometry.org.

■ 15-17. *Arizona Optometric Association 2015 Spring Congress.* Hilton Tucson El Conquistador Golf & Tennis Resort, Tucson, AZ. Hosted by: Arizona Optometric Association. To register, go to: http://arizona.aoa.org.

June 2015

■ **5-7.** *June "Summer" Conference.* Harborside Hotel & Marina, Bar Harbor, ME. Hosted by: Maine Optometric Association. To register, call (207) 288-5033 or toll-free 800-328-5033.

■ **12-14.** *2015 Annual Meeting.* Myrtle Beach, SC. Hosted by: North Carolina State Optometric Society. To register, call Adrianne Drollette at (919) 977-6964 or email adrianne@nceyes.org.

■ **19-21.** *2015 VOA Annual Conference.* Hilton, McLean, VA. Hosted by: Virginia Optometric Association. To register, call Bo Keeney at (804) 643-0309.

■ **24-28.** *Optometry's Meeting 2015.* Washington State Convention Center, Seattle, WA. Hosted by: American Optometric Association and American Optometric Student Association. To register, go to: http://optometrysmeeting.org.

July 2015

■ **17-18.** *Summer CE 2015. Resort at the Mountain, Welches, Oregon.* Hosted by: Oregon Optometric Physicians Association. To register, call Lynn Olson at (503) 654-5036 or email lynne@oregonoptometry.org.

September 2015

■ **16-19.** *International Vision Expo West.* Sands Expo & Convention Center, Las Vegas, NV. Hosted by: International Vision Expo West. To register, go to: www.visionexpowest.com.

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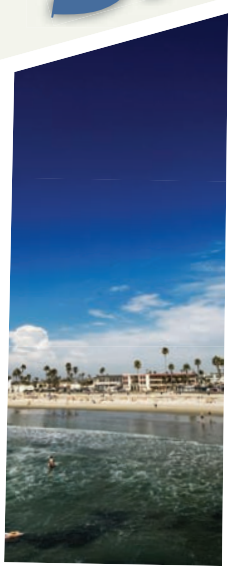

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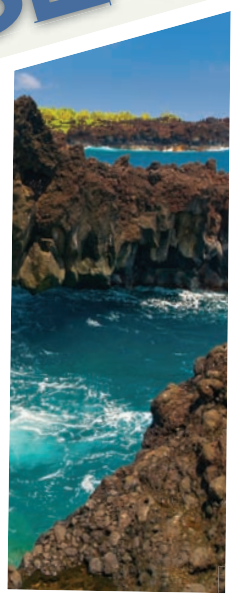

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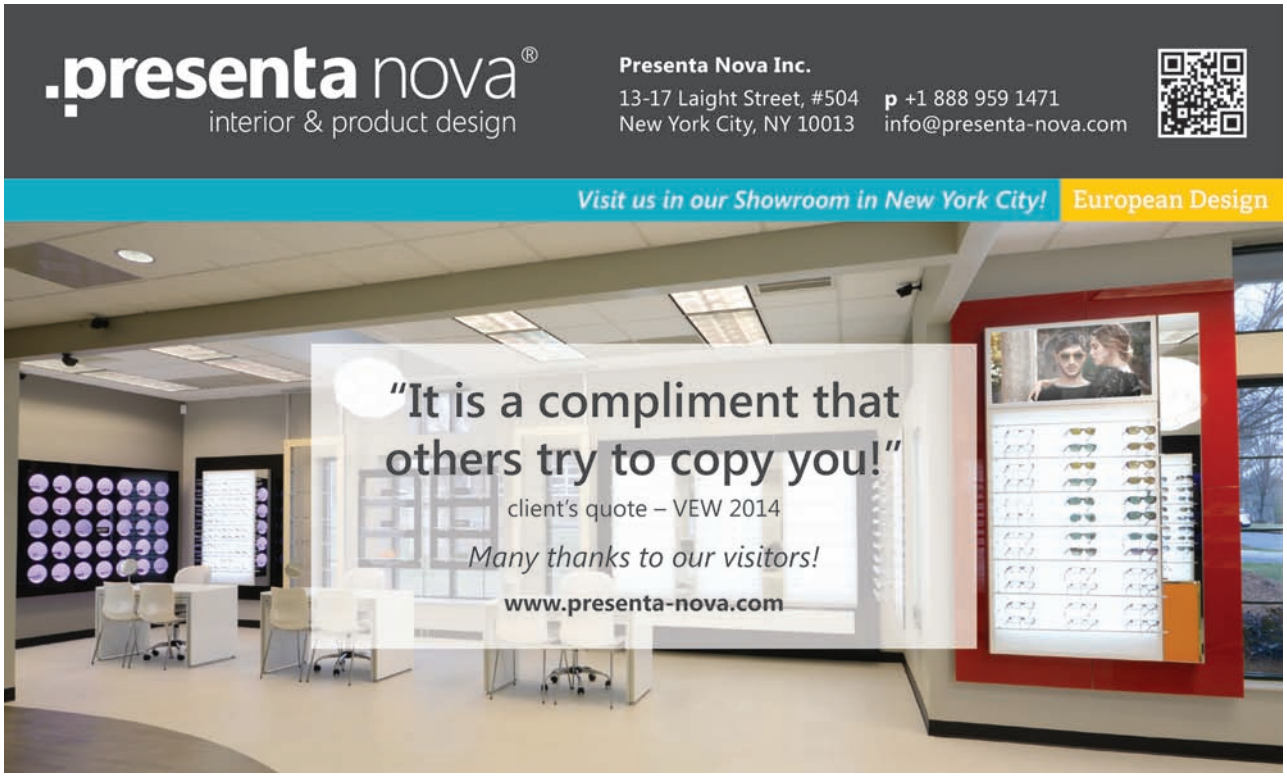

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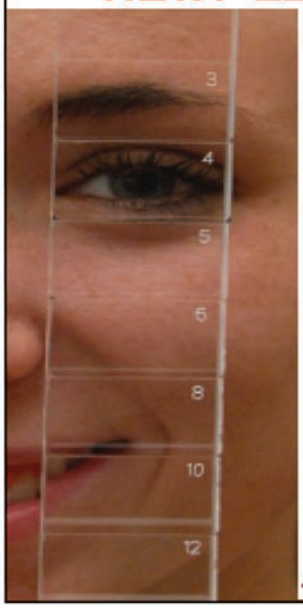

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Edited by Derek N. Cunningham, OD, and Walter O. Whitley, OD, MBA

Cloudy With a Chance of Lasers

When a post-cataract patient presents with blurred vision, YAG capsulotomy can swiftly restore clarity to the ocular media. **By Nathan Lighthizer, OD**

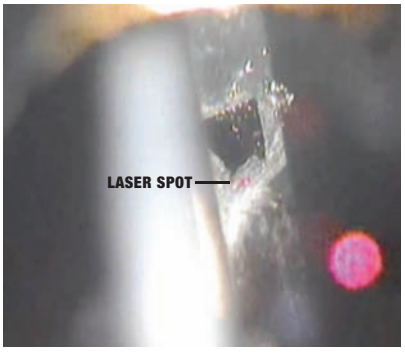
Cataract surgery is performed about three million times each year in the US, achieving fabulous results for the majority of patients. Unfortunately, approximately 30% to 50% of patients will develop a secondary cataract—also known as posterior capsular opacification (PCO)—at some point following cataract surgery. PCO can develop a few days to several years following cataract surgery, but occurs most commonly within the first one to two years following cataract extraction.

Patients often describe their vision as "not being as good as it was right after cataract surgery." Pay special attention to younger patients and those with silicone IOLs, as both of these factors increase the risk of PCO formation.

Qualification criteria for YAG laser capsulotomy closely follows those for cataract surgery itself: most patients should have a best-corrected visual acuity of 20/40 or worse via refraction or glare testing. We often like to document a one- to two-line improvement in vision on potential acuity testing.

At the preoperative exam, it is critical to dilate your patient to give the best view of the PCO, as well as allow for a full dilated retinal exam. Take care to ensure that the macula and peripheral retina are healthy,

To see a narrated video of YAG capsulotomy, visit www.reviewofoptometry.com, or scan the QR code.



Breakthrough of a Grade 3 PCO by YAG capsulotomy. Note the laser spot on the capsule (small red dot) and the corresponding reflection on the cornea.

given the nature of where and how the laser works. If you observe active macular edema, vitreomacular traction or peripheral holes, the procedure is contraindicated until a retinal specialist has cleared the patient.

Surgical Protocol

One drop of brimonidine 0.1% is instilled preoperatively to control the risk of IOP spike. A laser lens may be placed on the eye, depending on the laser being used and doctor preference. Proper, continuous patient education is critical during the procedure, as the patient may experience "popping" or an acoustic sound in their ears. This is a normal phenomenon that is experienced with the YAG laser during both peripheral iridotomies and capsulotomies.

Small pulses of YAG laser energy are placed just posterior to the PCO in the anterior vitreous. The energy then travels anteriorly, towards the front of the eye, disrupting the PCO and causing the cloudy membrane to open. Pulses of 1.5mJ to 3.0mJ energy in a single-shot distribution are commonly used to disrupt the PCO, typically in a cruciate or cross-like pattern.

Another drop of brimonidine 0.1% is instilled immediately post-laser to minimize the risk of IOP elevation. The patient is sent home with an anti-inflammatory, often prednisolone acetate 1.0%, to be used QID for one week.

At the one-week post-op visit, a close, undilated look at the IOL and posterior capsule is taken to ensure that no flaps or pieces of capsule remain along the visual axis or pupil, as that can contribute to continued glare or decreased vision. If needed, a touch-up procedure may be performed with the laser at this visit. The patient is also dilated at the one-week post-op exam to rule out any posterior segment problems.

YAG laser capsulotomy is the only effective treatment for posterior capsular opacification. Proper recognition and treatment will almost certainly improve your patient's vision, and leave them smiling and telling their friends how you returned it to the outstanding level they enjoyed immediately after cataract surgery. ■

Dr. Lighthizer is an assistant professor and the chief of the specialty care and electrodiagnostics clinics at Oklahoma College of Optometry.

BRIEF SUMMARY OF PRESCRIBING INFORMATION

INDICATIONS AND USAGE

SIMBRINZA® (brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2% is a fixed combination of a carbonic anhydrase inhibitor and an alpha 2 adrenergic receptor agonist indicated for the reduction of elevated intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

DOSAGE AND ADMINISTRATION

The recommended dose is one drop of SIMBRINZA® Suspension in the affected eye(s) three times daily. Shake well before use. SIMBRINZA® Suspension may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure.

If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart.

DOSAGE FORMS AND STRENGTHS

Suspension containing 10 mg/mL brinzolamide and 2 mg/mL brimonidine tartrate.

CONTRAINDICATIONS

Hypersensitivity - SIMBRINZA® Suspension is contraindicated in patients who are hypersensitive to any component of this product.

Neonates and Infants (under the age of 2 years) - SIMBRINZA® Suspension is contraindicated in neonates and infants (under the age of 2 years*) see Use in Specific Populations*

WARNINGS AND PRECAUTIONS

Sulfonamide Hypersensitivity Reactions - SIMBRINZA® Suspension contains brinzolamide, a sulfonamide, and although administered topically is absorbed systemically. Therefore, the same types of adverse reactions that are attributable to sulfonamides may occur with topical administration of SIMBRINZA® Suspension. Fatalities have occurred due to severe reactions to sulfonamides including Stevens-Johnson syndrome, toxic epidermal necrolysis, fulminant hepatic necrosis, agranulocytosis, aplastic anemia, and other blood dyscrasias. Sensitization may recur when a sulfonamide is re-administered irrespective of the route of administration. If signs of serious reactions or hypersensitivity occur, discontinue the use of this preparation *[see Patient Counseling Information]*

Corneal Endothelium - Carbonic anhydrase activity has been observed in both the cytoplasm and around the plasma membranes of the corneal endothelium. There is an increased potential for developing corneal edema in patients with low endothelial cell counts. Caution should be used when prescribing SIMBRINZA® Suspension to this group of patients.

Severe Renal Impairment - SIMBRINZA® Suspension has not been specifically studied in patients with severe renal impairment (CrCl < 30 mL/min). Since brinzolamide and its metabolite are excreted predominantly by the kidney, SIMBRINZA® Suspension is not recommended in such patients.

Acute Angle-Closure Glaucoma - The management of patients with acute angle-closure glaucoma requires therapeutic interventions in addition to ocular hypotensive agents. SIMBRINZA® Suspension has not been studied in patients with acute angle-closure glaucoma.

Contact Lens Wear - The preservative in SIMBRINZA® Suspension, benzalkonium chloride, may be absorbed by soft contact lenses. Contact lenses should be removed during instillation of SIMBRINZA® Suspension but may be reinserted 15 minutes after instillation *[see Patient Counseling Information]*.

Severe Cardiovascular Disease - Brimonidine tartrate, a component of SIMBRINZA® Suspension, has a less than 5% mean decrease in blood pressure 2 hours after dosing in clinical studies; caution should be exercised in treating patients with severe cardiovascular disease.

Severe Hepatic Impairment - Because brimonidine tartrate, a component of SIMBRINZA® Suspension, has not been studied in patients with hepatic impairment, caution should be exercised in such patients.

Potentiation of Vascular Insufficiency - Brimonidine tartrate, a component of SIMBRINZA® Suspension, may potentiate syndromes associated with vascular insufficiency. SIMBRINZA® Suspension should be used with caution in patients with depression, cerebral or coronary insufficiency, Raynaud's phenomenon, orthostatic hypotension, or thromboangiitis obliterans.

Contamination of Topical Ophthalmic Products After Use - There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products. These containers have been inadvertently contaminated by patients who, in most cases, had a concurrent corneal disease or a disruption of the ocular epithelial surface *[see Patient Counseling Information]*.

ADVERSE REACTIONS

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

SIMBRINZA® Suspension - In two clinical trials of 3 months duration 435 patients were treated with SIMBRINZA® Suspension, and 915 were treated with the two individual components. The most frequently reported adverse reactions in patients treated with SIMBRINZA® Suspension occurring in approximately 3 to 5% of patients in descending order of incidence were blurred vision, eye irritation, dysgeusia (bad taste), dry mouth, and eye allergy. Rates of adverse reactions reported with the individual components were comparable. Treatment discontinuation, mainly due to adverse reactions, was reported in 11% of SIMBRINZA® Suspension patients.

Other adverse reactions that have been reported with the individual components during clinical trials are listed below.

Brinzolamide 1% - In clinical studies of brinzolamide ophthalmic suspension 1%, the most frequently reported adverse reactions reported in 5 to 10% of patients were blurred vision and bitter, sour or unusual taste. Adverse reactions occurring in 1 to 5% of patients were blepharitis, dermatitis, dry eye, foreign body sensation, headache, hyperemia, ocular discharge, ocular discomfort, ocular keratitis, ocular pain, ocular pruritus and rhinitis.

The following adverse reactions were reported at an incidence below 1%: allergic reactions, alopecia, chest pain, conjunctivitis, diarrhea, diplopia, dizziness, dry mouth, dyspnea, dyspepsia, eye fatigue, hypertonia, keratoconjunctivitis, keratopathy, kidney pain, lid margin crusting or sticky sensation, nausea, pharyngitis, tearing and urticaria.

Brimonidine Tartrate 0.2% - In clinical studies of brimonidine tartrate 0.2%, adverse reactions occurring in approximately 10 to 30% of the subjects, in descending order of incidence, included oral dryness, ocular hyperemia, burning and stinging, headache, blurring, foreign body sensation, fatigue/drowsiness, conjunctival follicles, ocular allergic reactions, and ocular pruritus.

Reactions occurring in approximately 3 to 9% of the subjects, in descending order included corneal staining/erosion, photophobia, eyelid erythema, ocular ache/pain, ocular dryness, tearing, upper respiratory symptoms, eyelid edema, conjunctival edema, dizziness, blepharitis, ocular irritation, gastrointestinal symptoms, asthenia, conjunctival blanching, abnormal vision and muscular pain.

The following adverse reactions were reported in less than 3% of the patients: lid crusting, conjunctival hemorrhage, abnormal taste, insomnia, conjunctival discharge, depression, hypertension, anxiety, palpitations/arrhythmias, nasal dryness and syncope.

Postmarketing Experience - The following reactions have been identified during postmarketing use of brimonidine tartrate ophthalmic solutions in clinical practice. Because they are reported voluntarily from a population of unknown size, estimates of frequency cannot be made. The reactions, which have been chosen for inclusion due to either their seriousness, frequency of reporting, possible causal connection to brimonidine tartrate ophthalmic solutions, or a combination of these factors, include: bradycardia, hypersensitivity, iritis, keratoconjunctivitis sicca, miosis, nausea, skin reactions (including erythema, eyelid pruritus, rash, and vasodilation), and tachycardia.

Apnea, bradycardia, coma, hypotension, hypothermia, hypotonia, lethargy, pallor, respiratory depression, and somnolence have been reported in infants receiving brimonidine tartrate ophthalmic solutions *[see Contraindications]*.

DRUG INTERACTIONS

Oral Carbonic Anhydrase Inhibitors - There is a potential for an additive effect on the known systemic effects of carbonic anhydrase inhibition in patients receiving an oral carbonic anhydrase inhibitor and brinzolamide ophthalmic suspension 1%, a component of SIMBRINZA® Suspension. The concomitant administration of SIMBRINZA® Suspension and oral carbonic anhydrase inhibitors is not recommended.

High-Dose Salicylate Therapy - Carbonic anhydrase inhibitors may produce acid-base and electrolyte alterations. These alterations were not reported in the clinical trials with brinzolamide ophthalmic suspension 1%. However, in patients treated with oral carbonic anhydrase inhibitors, rare instances of acid-base alterations have occurred with high-dose salicylate therapy. Therefore, the potential for such drug interactions should be considered in patients receiving SIMBRINZA® Suspension.

CNS Depressants - Although specific drug interaction studies have not been conducted with SIMBRINZA® Suspension, the possibility of an additive or potentiating effect with CNS depressants (alcohol, opiates, barbiturates, sedatives, or anesthetics) should be considered.

Antihypertensives/Cardiac Glycosides - Because brimonidine tartrate, a component of SIMBRINZA® Suspension, may reduce blood pressure, caution in using drugs such as antihypertensives and/or cardiac glycosides with SIMBRINZA® Suspension is advised.

Tricyclic Antidepressants - Tricyclic antidepressants have been reported to blunt the hypotensive effect of systemic clonidine. It is not known whether the concurrent use of these agents with SIMBRINZA® Suspension in humans can lead to resulting interference with the IOP lowering effect. Caution is advised in patients taking tricyclic antidepressants which can affect the metabolism and uptake of circulating amines.

Monoamine Oxidase Inhibitors - Monoamine oxidase (MAO) inhibitors may theoretically interfere with the metabolism of brimonidine tartrate and potentially result in an increased systemic side-effect such as hypotension. Caution is advised in patients taking MAO inhibitors which can affect the metabolism and uptake of circulating amines.

USE IN SPECIFIC POPULATIONS

Pregnancy - *Pregnancy Category C:* Developmental toxicity studies with brinzolamide in rabbits at oral doses of 1, 3, and 6 mg/kg/day (20, 60, and 120 times the recommended human ophthalmic dose) produced maternal toxicity at 6 mg/kg/day and a significant increase in the number of fetal variations, such as accessory skull bones, which was only slightly higher than the historic value at 1 and 6 mg/kg. In rats, statistically decreased body weights of fetuses from dams receiving oral doses of 18 mg/kg/day (180 times the recommended human ophthalmic dose) during gestation were proportional to the reduced maternal weight gain, with no statistically significant effects on organ or tissue development. Increases in unossified sternebrae, reduced ossification of the skull, and unossified hyoid that occurred at 6 and 18 mg/kg were not statistically significant. No treatment-related malformations were seen. Following oral administration of ^{14}C-brinzolamide to pregnant rats, radioactivity was found to cross the placenta and was present in the fetal tissues and blood.

Developmental toxicity studies performed in rats with oral doses of 0.66 mg brimonidine base/kg revealed no evidence of harm to the fetus. Dosing at this level resulted in a plasma drug concentration approximately 100 times higher than that seen in humans at the recommended human ophthalmic dose. In animal studies, brimonidine crossed the placenta and entered into the fetal circulation to a limited extent.

There are no adequate and well-controlled studies in pregnant women. SIMBRINZA® Suspension should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers - In a study of brinzolamide in lactating rats, decreases in body weight gain in offspring at an oral dose of 15 mg/kg/day (150 times the recommended human ophthalmic dose) were observed during lactation. No other effects were observed. However, following oral administration of ^{14}C-brinzolamide to lactating rats, radioactivity was found in milk at concentrations below those in the blood and plasma. In animal studies, brimonidine was excreted in breast milk.

It is not known whether brinzolamide and brimonidine tartrate are excreted in human milk following topical ocular administration. Because many drugs are excreted in human milk and because of the potential for serious adverse reactions in nursing infants from SIMBRINZA® (brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2%, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

Pediatric Use - The individual component, brinzolamide, has been studied in pediatric glaucoma patients 4 weeks to 5 years of age. The individual component, brimonidine tartrate, has been studied in pediatric patients 2 to 7 years old. Somnolence (50-83%) and decreased alertness was seen in patients 2 to 6 years old. SIMBRINZA® Suspension is contraindicated in children under the age of 2 years *[see Contraindications]*.

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

OVERDOSAGE

Although no human data are available, electrolyte imbalance, development of an acidotic state, and possible nervous system effects may occur following an oral overdose of brinzolamide. Serum electrolyte levels (particularly potassium) and blood pH levels should be monitored.

Very limited information exists on accidental ingestion of brimonidine in adults; the only adverse event reported to date has been hypotension. Symptoms of brimonidine overdose have been reported in neonates, infants, and children receiving brimonidine as part of medical treatment of congenital glaucoma or by accidental oral ingestion. Treatment of an oral overdose includes supportive and symptomatic therapy; a patent airway should be maintained.

PATIENT COUNSELING INFORMATION

Sulfonamide Reactions - Advise patients that if serious or unusual ocular or systemic reactions or signs of hypersensitivity occur, they should discontinue the use of the product and consult their physician.

Temporary Blurred Vision - Vision may be temporarily blurred following dosing with SIMBRINZA® Suspension. Care should be exercised in operating machinery or driving a motor vehicle.

Effect on Ability to Drive and Use Machinery - As with other drugs in this class, SIMBRINZA® Suspension may cause fatigue and/or drowsiness in some patients. Caution patients who engage in hazardous activities of the potential for a decrease in mental alertness.

Avoiding Contamination of the Product - Instruct patients that ocular solutions, if handled improperly or if the tip of the dispensing container contacts the eye or surrounding structures, can become contaminated by common bacteria known to cause ocular infections. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions *[see Warnings and Precautions]*. Always replace the cap after using. If solution changes color or becomes cloudy, do not use. Do not use the product after the expiration date marked on the bottle.

Intercurrent Ocular Conditions - Advise patients that if they have ocular surgery or develop an intercurrent ocular condition (e.g., trauma or infection), they should immediately seek their physician's advice concerning the continued use of the present multidose container.

Concomitant Topical Ocular Therapy - If more than one topical ophthalmic drug is being used, the drugs should be administered at least five minutes apart.

Contact Lens Wear - The preservative in SIMBRINZA® Suspension, benzalkonium chloride, may be absorbed by soft contact lenses. Contact lenses should be removed during instillation of SIMBRINZA® Suspension, but may be reinserted 15 minutes after instillation.

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Diagnostic **Quiz**

A Little More Than a Headache

By Andrew S. Gurwood, OD

History

A 21-year-old black female presented with a chief complaint of a right-sided temporal headache that radiated to the back of her head. The headache persisted for one week, and was keeping her awake at night. She denied a history of nausea or vomiting.

Four days prior, she reported awakening with blurred vision in her right eye. She also reported one episode of horizontal diplopia and seeing a flash of light temporally.

The patient went to a hospital emergency room two days after experiencing visual symptoms. The ER attending informed her that she had a sinus headache and started her on Sudafed (pseudoephedrine, McNeil). This lessened the pain temporarily, but the headache returned as soon as the pain reliever wore off. She reported no other neurological symptoms.

Her systemic history was significant for chronic sinus infection, for which she was medicated with Sudafed QD and 600mg ibuprofen BID. Her ocular history was unremarkable. She reported no known allergies of any kind.

Diagnostic Data

Her best-corrected entering visual acuity measured 20/20 OD and OS at distance and near. Her external examination was normal, with no evidence of afferent pupillary defect. Extraocular movements were full and smooth. Confrontation fields were full to finger counting OU. Refraction uncovered a mild hyperopic increase (OD > OS).

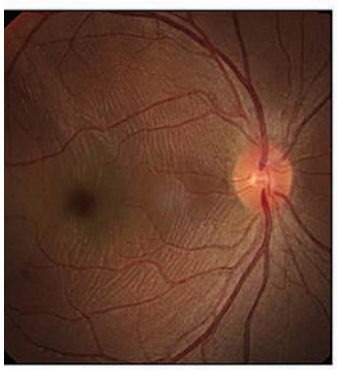
The biomicroscopic examination of the anterior segment demonstrated grade 1+ temporal injection in the right eye, but otherwise was normal. The left eye was unremarkable. Intraocular pressure measured 28mm Hg OD and 22mm Hg OS.

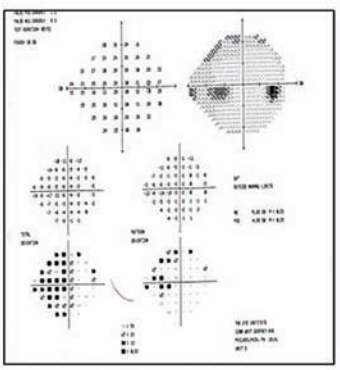
Your Diagnosis

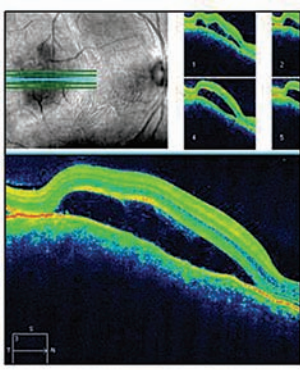
How would you approach this case? Does this patient require any additional tests? What is your diagnosis? How would you manage this patient? What's the likely prognosis?

To find out, please visit *Review of Optometry Online*, www.reviewofoptometry.com. Click on the cover icon, and then click "Diagnostic Quiz" under this month's table of contents. ■

Thanks to Heather Miller, OD, of Holland, Pa., and Michael Rebar, OD, of Coatesville, Pa., for contributing this case.







Fundus image, visual fields test and spectral-domain optical coherence tomography scan of our 21-year-old patient's right eye. What do you notice, and how should she be managed?

Retina Quiz Answers *(from page 68):* 1) a; 2) d; 3) b; 4) d; 5) c.

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For the treatment of elevated IOP

UNLOCK TREATMENT POSSIBILITIES

SIMBRINZA® Suspension delivered 21-35% mean IOP reduction at Month 3[1-3]

- 1-3 mm Hg greater than either component[4]
- Efficacy proven in two pivotal Phase 3 randomized, multicenter, double-masked, parallel-group, 3-month, 3-arm, contribution-of-elements studies. Primary objective of studies was to compare IOP-lowering efficacy of SIMBRINZA® Suspension, brinzolamide, 1%, and brimonidine, 0.2%. IOP was measured at 8am, 10am, 3pm, and 5pm[1,2]
- The most frequently reported adverse reactions in a 6-month clinical trial in patients treated with SIMBRINZA® Suspension occurring in approximately 3-7% of patients were eye irritation, eye allergy, conjunctivitis, blurred vision, dysgeusia (bad taste, conjunctivitis allergic, eye pruritus, and dry mouth[5]
- Only available beta-blocker-free fixed combination[2,3]

INDICATIONS AND USAGE

SIMBRINZA® (brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2% is a fixed combination indicated in the reduction of elevated intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

Dosage and Administration

The recommended dose is one drop of SIMBRINZA® Suspension in the affected eye(s) three times daily. Shake well before use. SIMBRINZA® Suspension may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure. If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart.

IMPORTANT SAFETY INFORMATION

Contraindications

SIMBRINZA® Suspension is contraindicated in patients who are hypersensitive to any component of this product and neonates and infants under the age of 2 years.

Warnings and Precautions

Sulfonamide Hypersensitivity Reactions—Brinzolamide is a sulfonamide, and although administered topically, is absorbed systemically. Sulfonamide attributable adverse reactions may occur. Fatalities have occurred due to severe reactions to sulfonamides. Sensitization may recur when a sulfonamide is readministered irrespective of the route of administration.
If signs of serious reactions or hypersensitivity occur, discontinue the use of this preparation.

Corneal Endothelium—There is an increased potential for developing corneal edema in patients with low endothelial cell counts.

Severe Hepatic or Renal Impairment (CrCl <30 mL/min)—SIMBRINZA® Suspension has not been specifically studied in these patients and is not recommended.

Contact Lens Wear—The preservative in SIMBRINZA® Suspension, benzalkonium chloride, may be absorbed by soft contact lenses. Contact lenses should be removed during instillation of SIMBRINZA® Suspension but may be reinserted 15 minutes after instillation.

Severe Cardiovascular Disease—Brimonidine tartrate, a component of SIMBRINZA® Suspension, had a less than 5% mean decrease in blood pressure 2 hours after dosing in clinical studies; caution should be exercised in treating patients with severe cardiovascular disease.

Adverse Reactions

In two clinical trials of 3 months' duration with SIMBRINZA® Suspension, the most frequent reactions associated with its use occurring in approximately 3-5% of patients in descending order of incidence included: blurred vision, eye irritation, dysgeusia (bad taste), dry mouth, and eye allergy. Adverse reaction rates with SIMBRINZA® Suspension were comparable to those of the individual components. Treatment discontinuation, mainly due to adverse reactions, was reported in 11% of SIMBRINZA® Suspension patients.

Drug Interactions—Consider the following when prescribing SIMBRINZA® Suspension:

Concomitant administration with oral carbonic anhydrase inhibitors is not recommended due to the potential additive effect. Use with high-dose salicylate may result in acid-base and electrolyte alterations. Use with CNS depressants may result in an additive or potentiating effect. Use with antihypertensives/cardiac glycosides may result in additive or potentiating effect on lowering blood pressure. Use with tricyclic antidepressants may blunt the hypotensive effect of systemic clonidine and it is unknown if use with this class of drugs interferes with IOP lowering. Use with monoamine oxidase inhibitors may result in increased hypotension.

For additional information about SIMBRINZA® Suspension, please see Brief Summary of full Prescribing Information on adjacent page.

Learn more at myalcon.com/simbrinza

SIMBRINZA®
(brinzolamide/brimonidine
tartrate ophthalmic suspension)
1%/0.2%

ONE BOTTLE. MANY POSSIBILITIES.

References: 1. Katz G, DuBiner H, Samples J, et al. Three-month randomized trial of fixed-combination brinzolamide, 1%, and brimonidine, 0.2% [published online ahead of print April 11, 2013]. *JAMA Ophthalmol.* doi:10.1001/jamaophthalmol.2013.188. **2.** Nguyen QH, McMenemy MG, Realini T, et al. Phase 3 randomized 3-month trial with an ongoing 3-month safety extension of fixed-combination brinzolamide 1%/brimonidine 0.2%. *J Ocul Pharmacol Ther.* 2013;29(3): 290-297. **3.** Data on file, 2013. **4.** SIMBRINZA® Suspension Package Insert. **5.** Whitson JT, Realini T, Nguyen QH, McMenemy MG, Goode SM. Six-month results from a Phase III randomized trial of fixed-combination brinzolamide 1% + brimonidine 0.2% versus brinzolamide or brimonidine monotherapy in glaucoma or ocular hypertension. *Clin Ophthalmol.* 2013;7:1053-1060.

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