Ophthalmology MANAGEMENT
January 2017

ACHIEVING DRY EYE SUCCESS

Highlights from our 3rd annual Creating a Dry Eye Center of Excellence program, held during AAO in Chicago

-FACULTY-
John D. Sheppard, MD, MMSc, Moderator
Johnny L. Gayton, MD • Laura M. Periman, MD
Mary Davidian, MD • Alan N. Carlson, MD

WHO KNEW THAT SOMETHING SO SMALL COULD HAVE SUCH A BIG IMPACT ON DRY EYE?

WE DID.

When it comes to advanced eye nutrition, ScienceBased Health is always there first.

HydroEye® Softgels have been shown to significantly alleviate dry eye symptoms, dampen inflammation and maintain corneal smoothness in a recent randomized clinical trial.*

Doctors: for a free 60-day supply, go to:

SBH.com/DryRelief or call 888-433-4726.

SBH | ScienceBased Health®

*Sheppard JD, Pflugfelder SC, et al. *Cornea*, Volume 32, Number 10, October 2013.

ACHIEVING DRY EYE SUCCESS

Contents

Ophthalmology MANAGEMENT

CHIEF MEDICAL EDITOR
Larry E. Patterson, MD

EXECUTIVE VICE PRESIDENT & PUBLISHER
Douglas Parry
doug.parry@pentavisionmedia.com

SPECIAL PROJECTS
Director | Angela Jackson
Manager | Alicia Hoglund
Editorial Assistant | Angela Bickel
Contributing Editor | Virginia Pickles

DESIGN AND PRODUCTION
Production Director | Sandra Kaden
Production Manager | Bill Hallman

PRODUCTION & EDITORIAL OFFICES
321 Norristown Road | Suite 150 | Ambler, PA 19002 | 215-628-6550

E-MEDIA & MARKETING SERVICES
Executive Vice President | Rob Verna
rob.verna@pentavisionmedia.com
215-367-2179 | Fax: 215-367-2141
Content Manager | Kathleen Shafer
Creative Director | Mike Cousart
Web Services Manager | Amanda Higgins
Creative Services Manager | Mindy Karper
Digital Marketing Coordinator | Charlotte Higgins

PENTAVISION LIVE!
Director | Abigail Markward
abby.markward@pentavisionmedia.com | 949-441-7549
Promotional Events Manager | Michelle Carver

SALES STAFF
Southeast Region Account Manager
Scott Schmidt
scott.schmidt@pentavisionmedia.com | 215-628-7714
Advertising Sales Representative
Skyler Goldstein
skyler.goldstein@pentavisionmedia.com | 267-492-5203
Sales Associate
Ryan Langton
ryan.langton@pentavisionmedia.com | 267-492-7744

CONFERENCE GROUP
Conference Director | Maureen Trusky, CMP
maureen.trusky@pentavisionmedia.com | 215-628-7754
Customer Service & Events Associate | Julia McNamee
julia.mcnamee@pentavisionmedia.com | 215-628-5211

PENTAVISION LLC
President & Manager | Thomas J. Wilson
Executive Vice Presidents | Mark Durrick, Douglas Parry, Rob Verna, Roger Zimmer

PentaVision

Achieving Dry Eye Success

FACULTY

John D. Sheppard, MD, MMSc (Moderator)
Dr. Sheppard is president and managing partner of Virginia Eye Consultants in Norfolk, Va. He is a professor at Eastern Virginia Medical School. Relevant to this supplement, he discloses relationships with Alcon, Allergan, Bio-Tissue, ScienceBased Health, Shire, TearLab, TearScience, and Topcon.

Johnny L. Gayton, MD
Dr. Gayton is the founder of Eyesight Associates, Warner Robins, Ga. Relevant to this supplement, he discloses relationships with Bausch + Lomb, ScienceBased Health, and Shire.

Laura M. Periman, MD
Dr. Periman practices at Redmond Eye Clinic, Redmond, Wash. Relevant to this supplement, she discloses relationships with Allergan, Bausch + Lomb, Bio-Tissue, and Topcon.

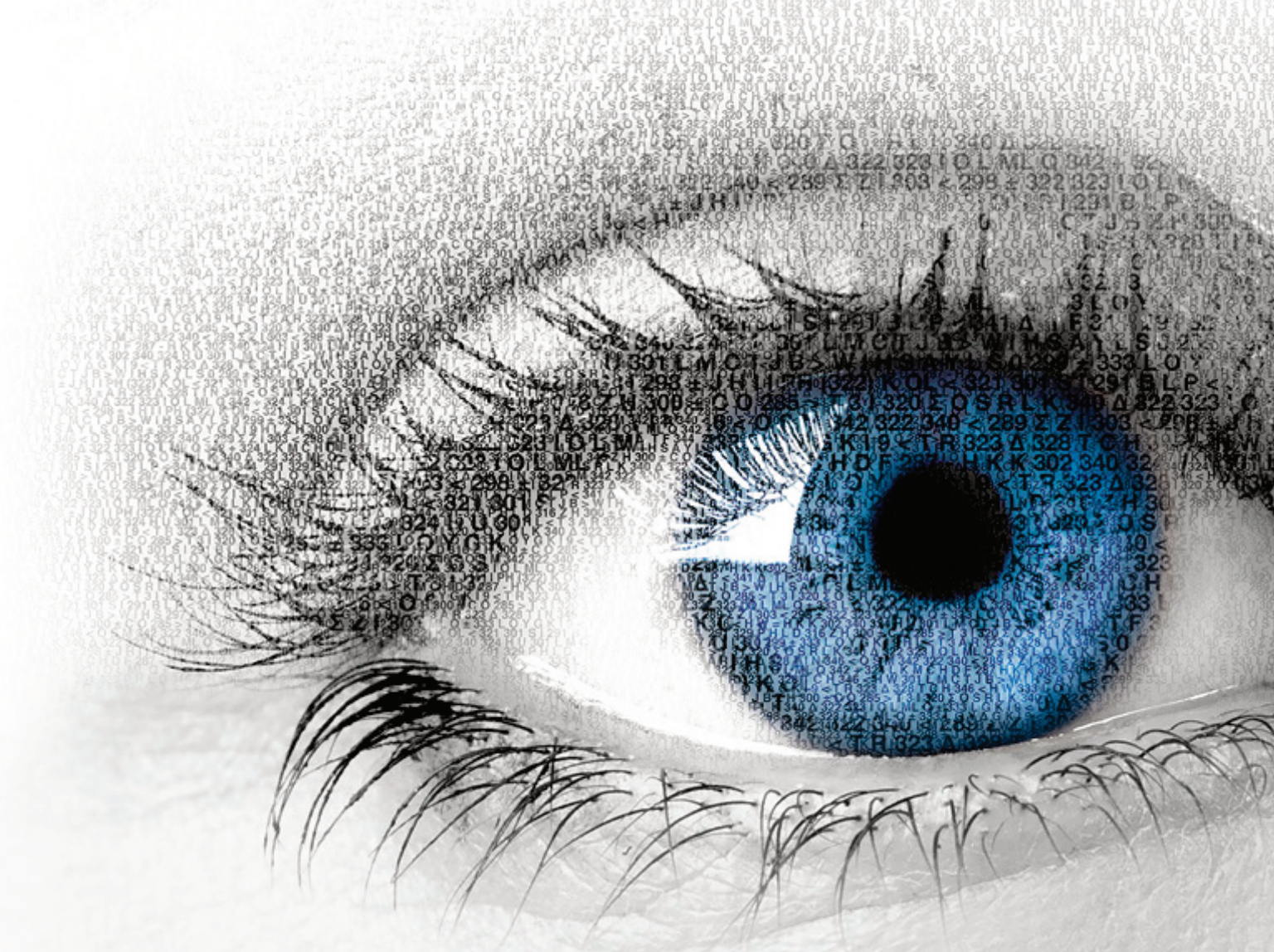
Mary Davidian, MD
Dr. Davidian is medical director and founder of Highland Ophthalmology Associates in New Windsor, N.Y., and clinical associate professor of ophthalmology at New York Eye and Ear Infirmary and New York Medical College. Relevant to this supplement, she discloses relationships with Bausch + Lomb, Bio-Tissue, and Shire.

Alan N. Carlson, MD
Dr. Carlson is a professor of ophthalmology at Duke Eye Center, Durham, N.C. Relevant to this supplement, he is a consultant to and equity owner in TearScience.

Special thanks to program coordinator Lauren Levine, who has been in the eye industry for more than 25 years. This is her third year spearheading the Dry Eye breakfast seminar.

The Dry Eye Center of Excellence seminar is brought to you by:

Alcon A Novartis Division | Allergan | biotissue
NovaBay Pharma | SBH ScienceBased Health® | Shire
TearLab | TearScience® The Evaporative Dry Eye Experts | TOPCON



Add data to your insights.

There is quantitative data in every eye. Uncovering this information can help guide your diagnosis and management of the ocular surface. In fact, the point-of-care TearLab Diagnostic Test provides precise and predictive information regarding tear osmolarity, an important biomarker of ocular surface health.

855-832-7522 | **TearLab.com**

TearLab®

OVERVIEW OF OUR DRY EYE CENTER OF EXCELLENCE

By John D. Sheppard, MD, MMSc

A management perspective

Ocular surface disease (OSD) is the common thread that runs through all ophthalmology specialties from cataract and refractive surgery to glaucoma, posterior segment disease, and oculoplastics. If left untreated, not only will OSD have a significant impact on comfort, vision, and long-term ocular health, but also on surgical outcomes.

Dry eye is prevalent in candidates for LASIK surgery[1] and blepharoplasty,[2] and one survey found that 80% of patients presenting for cataract surgery had evidence of dry eye, yet only 20% had been diagnosed.[3] What's more, any type of ocular surgery can trigger or exacerbate dry eye — cataract surgery adds one DEWS severity level and LASIK surgery adds two[4] — complicating recovery and long-term results.

As managing senior partner of our practice, I must be mindful of the big picture and its impact on our bottom line. With decreased reimbursements, regulatory expansion, burgeoning demographics, and fewer providers, it is incumbent upon us to invest in OSD if we want to deliver state-of-the-art care and maintain our leadership position in the community.

Here, I describe how we expanded our procedures and product lines and earned the Dry Eye Center of Excellence certification, an initiative that has resulted in substantial practice growth and patient satisfaction.

Plugs and Pulses

Punctal plugs are often ignored as a viable treatment option for dry eyes, but they are useful for short-term, rapid results, and we can produce some reasonable income with permanent and temporary punctal occlusion (Figure 1). We tend to use the dissolving punctal plugs because fewer callbacks are necessary, and we can renew them every 3 to 6 months.

We use various techniques to improve meibomian gland physiology, and we have enjoyed growth in our thermal pulsation practice with LipiFlow (TearScience) (Figure 2). This must be considered a premium offering as it requires counselors and payment plans to help bring this therapy to the largest population. Our usage has doubled since a recent price reduction went into effect.

Nutritional Supplementation

We are great proponents of HydroEye (ScienceBased Health), which contains the omega fatty acid GLA, which is derived from black currant seed oil as well as omega-3s (EPA, DHA) from fish oil. Our prospective, multicenter, randomized study of patients with evaporative dry eye showed that their Ocular Surface Disease Index scores improved after using HydroEye for 6 months.[5] Staining revealed that the HLA-DR and the CD11c inflammatory markers stabilized with the omega-3 supplement, whereas the inflammatory process continued without that intervention.

Simply delaying the aging process through supplementation produced valuable clinical insights in this first prospective analysis showing statistically significant results in a dry eye population.

Collagen, ProLong, Silicone, Hyfrecator

Estimated Punctal Occlusion Collections

• Collagen & Silicone Plugs	$292,000
• Punctal Cautery	$25,000
• Total	$317,000

Figure 1. Permanent and temporary punctal occlusion can produce rapid results and reasonable income.

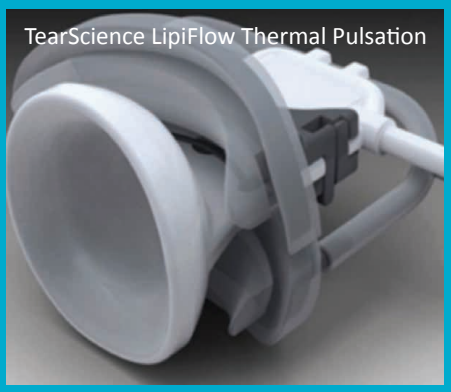


Figure 2. Thermal pulsation improves meibomian gland physiology.

Recalcitrant Dry Eye

In some recalcitrant cases in which severe OSD inhibits clarity of the central visual axis despite maximum medical therapy, we use the Prokera biologic corneal bandage (Bio-Tissue). The amniotic membrane tissue in Prokera products is preserved using the company's proprietary processing method to ensure the tissue retains its full biologic activity. It has natural

therapeutic actions that help heal damaged eye surfaces, and it imparts a wide variety of advantages over a standard bandage contact lens, including sustained growth factor delivery and superior oxygen permeability.

In a study of 40 patients treated with the Prokera biologic corneal bandage, we saw 95% improvement in fluorescein staining, 85% improvement in symptoms, and a wide variety of benefits, including normalization of MMP-9 expression in irregular surface topography.

An example of Prokera's effect is seen in a patient who presented for cataract surgery with basement membrane dystrophy, previous laser surgery, and dry eye (Figure 3). He has higher-order coma aberrations that are extremely high and irregular keratometry readings. After placing a Prokera biologic corneal bandage for 1 week, coma was reduced significantly and keratometry readings improved. In addition, keratometry readings were markedly different, and there was a 0.5D change in the IOL prescription sphere.

Looking at the metrics for just one Prokera treatment per day ($1,200/unit), the financial impact of the procedure is clear, contributing $312,000 yearly revenue.

Combining our revenue from the therapeutics I have described thus far, we have produced a reasonable bottom line in our practice (Figure 4). Note that we use only therapeutics that have been shown to produce evidence-based improvements in outcomes, and these treatments must be managed intelligently by motivated physicians.

As we expand our product line, we must track utilization and revenue generated by each doctor. We look at which doctor is doing the most retail sales, the highest LASIK volume, and the highest premium IOL volume. If you can't measure it, you can't track it and change it.

Diagnostic Testing

• The TearLab Osmolarity Test is the foundation of our diagnostic testing, and we test virtually everyone who walks through our door — new dry eye patients, new surgery patients, patients with post-LASIK hyperesthesia syndrome, and a wide variety of patients who have what may be symptomatically disproportionate OSD. We also use this test for punctal plug and contact lens decision analysis, as well as follow-up treatment assessments.

Our practice performs about 50,000 TearLab Osmolarity Tests annually, which generates significant income (Figure 5). Income can be highly variable based on insurance plans, however, underscoring the importance of negotiating contracts with individual carriers. You also must be cautious about bundling and coupling procedures that may have the same diagnostic code. For example, you will receive 50% less for the second procedure if it is a punctal plug, a tear osmolarity test, or an MMP-9 test (InflammaDry, RPS).

• In addition, you must use the AdenoPlus test (RPS) in your office. It is key to diagnosing adenovirus, which may lead to central infiltrates and conjunctival scarring (Figure 6). This test is by far the best means we have of telling a patient that he has to stay home for 10 days because he is contagious. Don't be the person who creates an epidemic in your office. The number one cause of epidemic keratoconjunctivitis is not the shipyard — these days, it is the eyecare provider's office.

• Blepharitis remains a great concern to us, not only because of chronic recalcitrant OSD and dry eye, but also because of the potential for infection. We use LipiView and LipiScan (TearScience) in all of our offices. We find these tests produce valuable diagnostic and consultative information for patients who require intervention with the LipiFlow (TearScience) device. We use the dynamic meibomian imaging as a cash-pay or an imaging-pay situation, depending on the patient.

• Allergic conjunctivitis, which is common in children and adults, is the forgotten ocular surface disease. The Doctor's Allergy Formula diagnostic test (Bausch + Lomb) is a

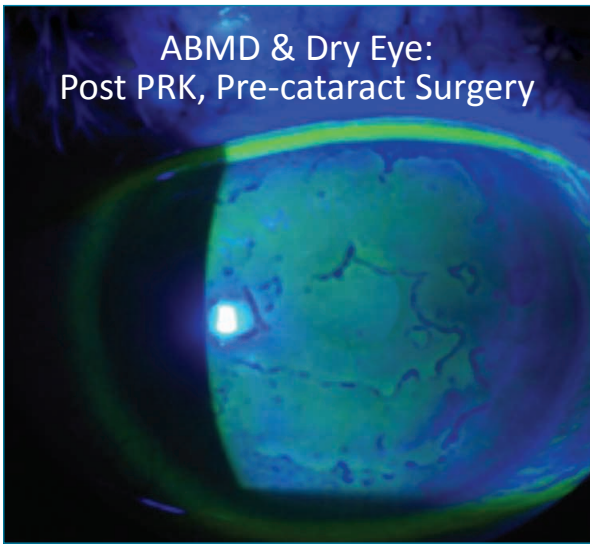
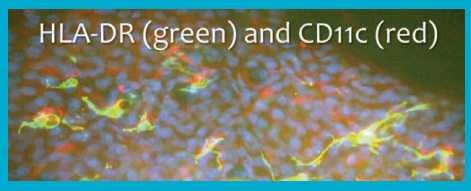


Figure 3. Before cataract surgery, this patient was treated with a Prokera biologic corneal bandage.

Combined Therapeutics Revenue

• LipiFlow	$ 141,000.00
• Prokera	$ 312,000.00
• Retail	$ 431,000.00
• Punctal Occlusions	$ 317,000.00
• Total	$ 1,201,000.00

Figure 4. Therapeutic dry eye treatments represent more than $1 million of our practice's total revenue.



Manage Your Images

An image-management system is essential for any ophthalmology practice, and in this era of electronic health records, efficiency is paramount for those of us who feel slowed down in the office, clicking and pointing rather than talking directly to our patients. In our practice, we use the Topcon Synergy Ophthalmic Data Management System to organize all of our anterior and posterior segment images.

12 Doctors: 192 Office Days/Year

Specialty	Tests/Day	Tests/Year
Cornea/External	40 (20 patients)	7,680
Cornea/Refractive	30	5,850
Cataract/Refractive	20	3,840
Glaucoma/Cataract	20	3,840
Oculoplastic/Orbit	12	2,304
Comprehensive (3)	60	11,520
Optometry (4)	80	15,360
Total	262	50,394

TearLab Osmolarity Collections

- 12 Doctors
- 50,394 Tests/Year
- $19.00/Test
- $955,776.00/Year

Figure 5. TearLab Osmolarity Tests generate almost $1 million annually in our practice.

AdenoPlus Test – RPS

- Detects all serotypes typically known to cause adenoviral conjunctivitis
- Rapid, point-of-care test
- Highly accurate
- Easy to use
- Painless
- Guides Rx

Figure 6. The AdenoPlus test is key to diagnosing adenovirus.

Allergy Skin Test Collections

- 12 Doctors
- ~2 Tests/Week
- $420.00/Analysis
- ~$483,840.00/Year

Figure 7. The Doctor's Allergy Formula diagnostic test is convenient for patients and a good income source for the practice.

Managing Your Retail Business

Patients appreciate being able to obtain their nonprescription dry eye aids from one source. We use an online portal (MyEyeStore.com/virginiaeyeconsultants), which is an incredibly useful way to reduce the overhead in our practice while ensuring that patients have access to the products we recommend.

To do well with retail collections, you must have a good financial manager tracking these sales to ensure that what you're doing is benefiting the practice and not creating excess inventory.

noninvasive test that can be performed by a technician in your office in 2 minutes, with results available in 10 minutes. This test enables us to tailor preventive care for patients and potentially reduce medication usage. We know that we get better results with LASIK, for instance, when the patient's allergies are controlled.[6-7] This test is convenient for patients and a good income source for the practice (Figure 7).

Practice Growth Strategies

There are four avenues toward practice growth:

1. patient acquisition
2. insurance-based business
3. cash-based business
4. value-added services

Our most effective marketing tool to acquire new patients is to engage friends and family of our patients through direct contact, such as brochures about dry eye in the clinic and conversations about this disease with anyone accompanying patients to our offices.

Opportunities for growth in insurance-based business also exist. Cigna, for example, reimburses $38 for an intermediate visit, but you can increase your income for that visit by more than 200% by performing proper diagnostic testing and providing the appropriate intervention based on degree of inflammation or hyperosmolarity readings.

The most valuable asset in your practice is doctor-provider time, so you must make the best use of it. For instance, a routine cataract surgery may generate $40 per minute for your cataract surgeon; however, treating dry eye adds value to your

Insurance-based Revenue

Procedure	Time	Fee	$/minute
•Cataract	15 min	$600	$40
•Epilation	1 min	$45	$45
•Plugs OU	5 min	$270	$54
•Allergy Tests	5 min	$420	$84
•Prokera	10 min	$1,200	$120
•Toric IOL	15 min	$2,100	$140

Cash-based Business Revenue

Procedure	Time	Fee	$/minute
•Bleph OU	60 min	$2,400	$40
•Botox	10 min	$500	$50
•LASIK OU	20 min	$3,000	$150
•LipiFlow OU	10 min	$1,800	$180

Figure 8. Treating dry eye adds value not only to the patient experience, but also to the practice's bottom line.

Combined Diagnostics Collections

•Osmolarity	$955,776.00
•InflammaDry	$603,648.00
•LipiView	$57,600.00
•DMI	$123,120.00
•Allergy Testing	$483,840.00
•Total	$2,223,984.00

Combined Dry Eye Collections

•Diagnostics	•$ 2,223,984.00
•Therapeutics	•$ 1,201,000.00
•Total	•$ 3,424,984.00

Figure 9. Combined diagnostic collections (a) and therapeutics collections (b) produce revenue that has the potential to be the equivalent of three new medical providers.

practice and to the patient, who will benefit from a potentially better outcome (Figure 8).

Similarly, if we evaluate our cash-based procedures, we see that a blepharoplasty can be valuable and that Botox (onabotulinumtoxinA, Allergan) is valuable, but LASIK and LipiFlow are at the top of the list for best utilization of provider time (Figure 8).

If we add combined diagnostic collections with combined therapeutic collections, we have a tremendous increase in the bottom line (Figure 9). That revenue is the equivalent of three new providers, and it was obtained entirely through internal marketing and existing — but optimized — providers.

A pharmacoeconomic analysis shows fewer visits, fewer guesses at therapy, less random therapy, empirical therapy, OTC therapy, gasoline, and work missed, for a net savings of more than $1 million to society, because we are using our analytical skills to deliver the best, most appropriate care to our patients.

Execute and Win

Several components are required to successfully execute a Dry Eye Center of Excellence. You must have a "doctor champion," someone whom the other providers in your practice respect and to whom they will look for appropriate application of these principles. You also need leadership, an engaged administration, and an educated staff. Everyone in your practice must know where to send a dry eye patient, a LASIK patient, a Botox patient, and a premium IOL patient. You must use internal and targeted external marketing.

This is a win for all. Patients win with diagnostic accuracy and timely, appropriate treatment. Payers win because targeted therapy means fewer visits and fewer random medications. Providers win because the practice grows, and the practice wins because income is diversified. Everybody wins because this is good medicine. ■

Communicate With Simplicity

Clinicians use a number of different terms — ocular surface disease, meibomian gland dysfunction, and Sjögren's syndrome, for example — to describe conditions characterized by dry eyes. Often, these diseases overlap and are labeled collectively as ocular surface disease. In our practice, we have found that "dry eye disease" is the simplest and, thus, best understood term to use when communicating with patients, other providers, and referrers. Dry eye is so important to our practice that we include that term when marketing to our patients and the public, as well as to our referral sources.

References

1. Azuma M, Yabuta C, Fraunfelder FW, Shearer TR. Dry eye in LASIK patients. *BMC Res Notes*. 2014;7:420.

2. Prischmann J, Sufyan A, Ting JY, Ruffin C, Perkins SW. Dry eye symptoms and chemosis following blepharoplasty: a 10-year retrospective review of 892 cases in a single-surgeon series. *JAMA Facial Plast Surg*. 2013;15:39-46.

3. Trattler W, Reilly C, Goldberg D, et al. Cataract and Dry Eye: Prospective Health Assessment of Cataract Patients' Ocular Surface Study. Poster presented at: ASCRS-ASOA Symposium & Congress; March 2011; San Diego, CA.

4. Behrens A, Doyle JJ, Stern L, et al; Dysfunctional tear syndrome study group. Dysfunctional tear syndrome: a Delphi approach to treatment recommendations. *Cornea*. 2006;25:900-907.

5. Sheppard JD Jr, Singh R, McClellan AJ, et al. Long-term supplementation with n-6 and n-3 PUFAs improves moderate-to-severe keratoconjunctivitis sicca: a randomized double-blind clinical trial. *Cornea*. 2013;31:1297-1304.

6. Bielory BP, O'Brien TP. Allergic complications with laser-assisted in-situ keratomileusis. *Curr Opin Allergy Clin Immunol*. 2011;11:483-491.

7. Boorstein SM, Henk HJ, Elner VM. Atopy: a patient-specific risk factor for diffuse lamellar keratitis. *Ophthalmology*. 2003;110(1):131-137.

WHY AND HOW WE STARTED A DRY EYE CLINIC

By Johnny L. Gayton, MD

From decision to execution, here is how one practice integrated this specialty

Back in 1996, I had a great, booming practice. Everything was going well. Then a patient came in with red eyes. She had already seen three eyecare providers who referred her to me. Nobody knew what was wrong. Lacking the diagnostic tests we have today, I did not know either.

Three days later, however, I knew exactly what she had — because I had it, too: severe epidemic keratoconjunctivitis. My best-corrected visual acuity was 20/80. I had severe corneal precipitates that required treatment with a steroid, causing my intraocular pressure to rise to 60 mmHg, and I developed cataracts that required surgery.

I also developed chronic, severe dry eye, to the point of needing an assistant to instill artificial tears in my eyes while performing surgery. It was a continual, long-term problem. So, not only was I motivated to start a dry eye clinic for my patients, but also to get some relief for myself.

How do you start a dry eye program? Here are some of the highlights of our process.

Educate and Organize

Our practice began with education. Key staff members attended Dry Eye University, founded by Frank W. Bowden III, MD, in Jacksonville, Fla. We also invited dry eye experts Jerry Robben, OD, and Laura M. Periman, MD, to our practice to familiarize us with this specialty. And, of course, I asked some of the leaders around the country for their recommendations for setting up a dry eye clinic.

Next we selected a lead for our dry eye clinic and developed a standard of care for diagnosing and treating dry eye.

Gain Consensus and Support

We presented our standard of care to everyone in the practice and worked diligently to ensure its adoption. The entire staff — from physicians, nurses, and technicians to front desk personnel — must be on board.

We also had meetings with our physicians to gain their support for this initiative. We emphasized that we will now be able to improve patient care well beyond the common practice of offering patients samples of various lubricant drops — an approach that is not based on scientific evidence and, in my opinion, does not inspire confidence in patients.

Initially, physicians and staff had some concerns. For example, some physicians felt that diagnosing and treating dry eye disease would be too time-consuming, taking up appointment slots needed for other patients and resulting in lost revenue. They soon realized, however, that focusing on dry eye can be a significant revenue booster by increasing doctor visits, diagnostic tests, and therapeutic modalities.

Likewise, clinical staff members were concerned that managing these patients would take up too much of their time and disrupt their schedules. As we have incorporated dry eye management into our practice, however, we have found that we are actually saving time. Patients need fewer return visits because we can address their dry eye problems efficiently, often in one visit. In addition, when we treat the ocular surface up front, patients are less likely to develop postoperative complications.

We now have a lead dry eye optometrist, a dedicated dry eye clinic day, and dry eye appointment slots, and we are following our standard of care. It took roughly a year before we were running smoothly, but the clinical staff has become quite proficient in diagnostic testing, and the speed of their workups has improved, aided by their use of the SPEED questionnaire.[1] (See "The SPEED Questionnaire for Rapid Screening" sidebar, page 11). Most importantly, we have improved patient care and satisfaction, even as we are still learning and adapting.

Key Diagnostic Tools

The LipiScan high-definition meibomian gland imager (TearScience), the LipiView II ocular surface interferometer (TearScience), and the TearLab Osmolarity System are key to diagnosing dry eye disease. What's more, having images and measurements to share with patients helps us educate and reassure them that they actually do have a disease and are not imagining their symptoms. For example, I can show them the pink strip on the InflammaDry (RPS), which detects elevated levels of MMP-9 protein, and explain that a positive

result means they have significant inflammation. From there, we discuss how I will tailor the treatment to their specific situation.

Targeted Treatments

We offer a full range of dry eye treatments. Here is an overview.

Retaine MGD ophthalmic emulsion (Ocusoft) is a preservative-free, lipid-replenishing formula that uses electrostatic attraction to stabilize the tear film and protect against moisture loss.

Oasis Tears Plus (Oasis Medical), are preservative-free, viscoadaptive, lubricating eye drops with glycerin to retain tears on the ocular surface.

We also offer the oral supplement HydroEye (ScienceBased Health), which contains the omega fatty acid GLA, which is derived from black currant seed oil as well as omega-3s (EPA, DHA) from fish oil. This is one of the few nutritional products that has been studied and found effective for improving dry eye symptoms.[2]

Avenova (NovaBay) for lid and lash hygiene is an effective adjunct for treating blepharitis. It is useful for treating pre-op patients.

The prescription medicines we use include the following:

- doxycycline
- AzaSite (azithromycin, Akorn), which is indicated for the treatment of bacterial conjunctivitis caused by susceptible isolates of various microorganisms, such as *Staphylococcus aureus*, *Streptococcus mitis* group, and *Streptococcus pneumoniae*
- Restasis (cyclosporine, Allergan), which is indicated for the treatment of reduced tear production owing to inflammation from dry eye disease
- Xiidra (lifitegrast, Shire), which is indicated for the treatment of dry eye disease. On a personal level, this is the product that significantly improved my dry eye condition.

We also perform LipiFlow treatments (TearScience), applying heat and pressure to the inner eyelid to safely remove gland obstructions and stagnant gland content.

Another useful adjunctive therapy is intense pulsed light (IPL, Toyos), which improves meibomian gland function, kills microorganisms, improves the signs of blepharitis, melts thick secretions, and stimulates cells and glands to function normally.

The Pellevé wrinkle reduction system (Ellman), which is used in oculoplastic surgery, has a handpiece that can be used to heat the meibomian glands to facilitate manual expression. An advantage of this treatment is that you can use it on any skin color without the risk of hyperpigmentation or scarring that sometimes occurs with IPL.

Worthy Focus with Long-term Benefits

The Hippocratic Oath states in part: "I will remember that I do not treat a fever chart, a cancerous growth, but a sick human being, whose illness may affect the person's family and economic stability." Dry eye disease markedly decreases the quality of life for many people.

The Oath continues: "My responsibility includes these related problems, if I am to care adequately for the sick. I will prevent disease whenever I can, for prevention is preferable to cure."

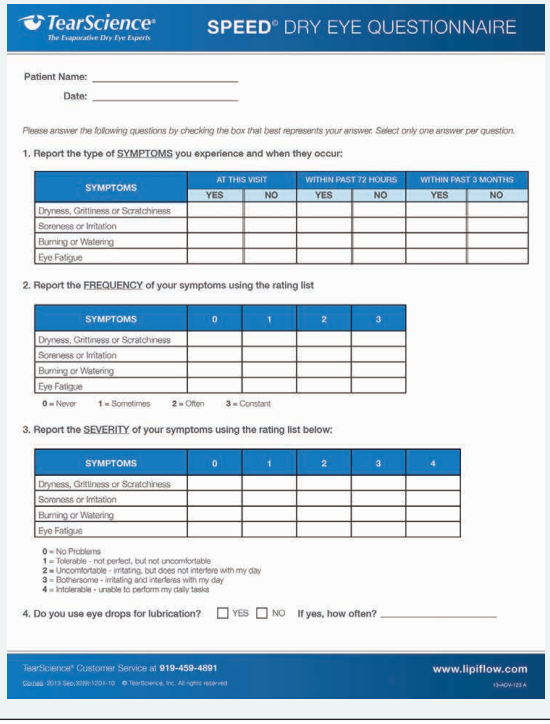
When you have a comprehensive dry eye program, you will prevent a legion of problems. If my dry eye had been adequately treated in 1996, for example, I would not have the scarring of the eyelids and corneas that I have now. These are just some of the long-term complications that can be prevented with prompt and effective treatment. I would strongly encourage you to adopt a dry eye program. ■

References

1. Ngo W, Situ P, Keir N, et al. Psychometric properties and validation of the Standard Patient Evaluation of Eye Dryness questionnaire. *Cornea*. 2013;32:1204-1210.

2. Sheppard JD Jr, Singh R, McClellan AJ, et al. Long-term supplementation with n-6 and n-3 PUFAs improves moderate-to-severe keratoconjunctivitis sicca: A randomized double-blind clinical trial. *Cornea*. 2013;32:1297-1304.

The SPEED Questionnaire for Rapid Screening



TearScience® The Evaporative Dry Eye Experts

SPEED® DRY EYE QUESTIONNAIRE

Patient Name: _____

Date: _____

Please answer the following questions by checking the box that best represents your answer. Select only one answer per question.

1. Report the type of SYMPTOMS you experience and when they occur:

SYMPTOMS	AT THIS VISIT		WITHIN PAST 72 HOURS		WITHIN PAST 3 MONTHS	
	YES	NO	YES	NO	YES	NO
Dryness, Grittiness or Scratchiness						
Soreness or Irritation						
Burning or Watering						
Eye Fatigue						

2. Report the FREQUENCY of your symptoms using the rating list

SYMPTOMS	0	1	2	3
Dryness, Grittiness or Scratchiness				
Soreness or Irritation				
Burning or Watering				
Eye Fatigue				

0 = Never 1 = Sometimes 2 = Often 3 = Constant

3. Report the SEVERITY of your symptoms using the rating list below:

SYMPTOMS	0	1	2	3	4
Dryness, Grittiness or Scratchiness					
Soreness or Irritation					
Burning or Watering					
Eye Fatigue					

0 = No Problems
1 = Tolerable - not perfect, but not uncomfortable
2 = Uncomfortable - irritating, but does not interfere with my day
3 = Bothersome - irritating and interferes with my day
4 = Intolerable - unable to perform my daily tasks

4. Do you use eye drops for lubrication? ☐ YES ☐ NO **If yes, how often?** _____

TearScience® Customer Service at **919-459-4891** **www.lipiflow.com**

Figure 1. The SPEED questionnaire is a quick screening tool to assess the frequency and severity of dry eye symptoms. It can also be used to monitor treatment outcomes.

My Testimonial

Personally, I've had LipiFlow done twice. I've had Toyos IPL treatment five times. I've had the Pellevé treatments multiple times. I've used a lot of different medications, but Xiidra (lifitegrast, Shire) has changed my life. Two days after I started taking Xiidra, I was dramatically better. Two weeks after I went on Xiidra, we repeated my diagnostic testing. I had improved in every category. No, the dry eye has not mysteriously healed, but it is so much better, and I'm using fewer medications.

SIMPLIFYING THE COMPLICATED: OCULAR SURFACE DISEASE AND THE KISS PRINCIPLE

By Laura M. Periman, MD

While the mechanisms driving dry eye disease can be complex, your approach to treatment doesn't have to be

As a molecular biologist, I find simplifying complex concepts to be an interesting task. We're all familiar with the International Dry Eye Workshop (DEWS) Report,[1] which splits the major etiological causes of dry eye into aqueous-deficient dry eye and evaporative dry eye. In my opinion, however, the most important mechanism is the chronic cycle of inflammation, illustrated by the solid red arrows in Figure 1. Inflammation begets inflammation in a vicious cycle. It drives aqueous deficiency and evaporative dry eye, and then cycles back around. As this process continues, the ocular surface suffers.

Dry Eye Disease (DED) results from an aberrant activation of our native immunologic defenses.[1] The human immune system is in a constant state of checks and balances, with one foot on the brake and one on the gas in a normal, healthy state. Loss of immunoregulatory control fuels the cycle of chronic inflammation. Figure 2 is a summary of peer-reviewed literature that illustrates what is happening on a molecular level. I think of ocular surface disease (OSD) immunopathophysiology as a novel with 20 chapters with several notable parts. The process involves an initial aberrant activation phase (release of acute phase cytokines) and an early amplification phase (early MMP-9 activity and Dendritic cell activation). This is followed by a T-cell differentiation and recruitment phase

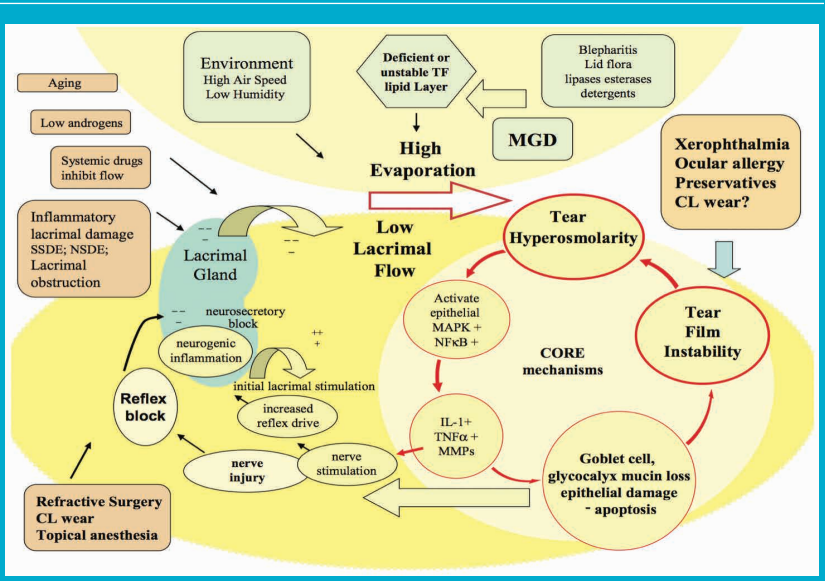


Figure 1. Inflammation drives and results from aqueous-deficient dry eye and evaporative dry eye in a chronic downward cycle.[1]

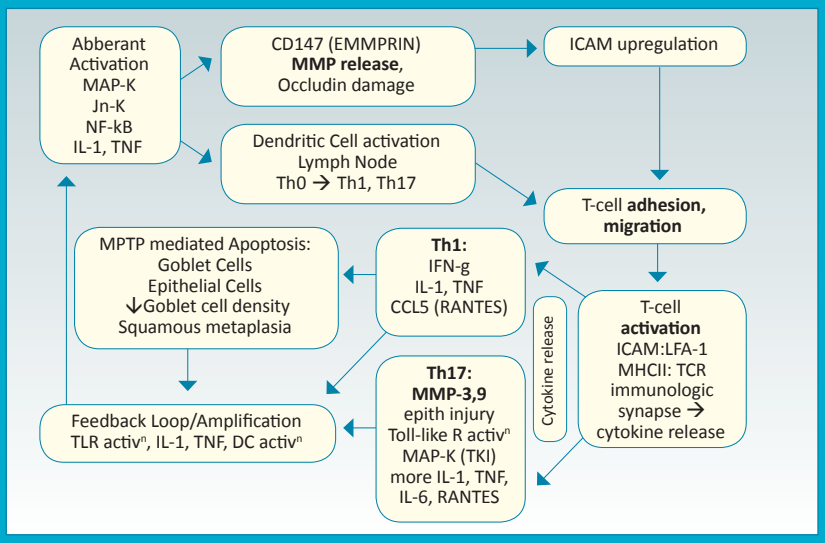


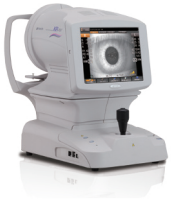
Figure 2. The immunopathophysiology of dry eye disease is an aberrant activation of our native defenses.

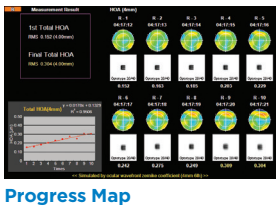
This year,

270,000 people

will be diagnosed with dry eye disease.[1]

Make sure you're prepared.

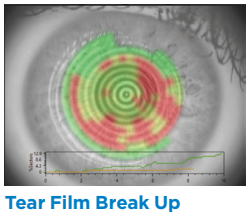




Progress Map

KR-1W

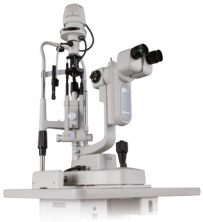
Fully automated total visual path analysis. Continuous measuring function shows the effect of tear film break up. The progress map shows the impact on your patients vision.



Tear Film Break Up

CA-800

Full corneal topography and meibography capability, tear film break up function. Automatic blink detection with color map and chart.



SL-D701

Meibography and color anterior segment capture.

Learn more at: **newsgram.topconmedical.com/dryeye2017**

1. Source: 2012 US Gallup Poll

TOPCON

YOUR VISION. OUR FOCUS.

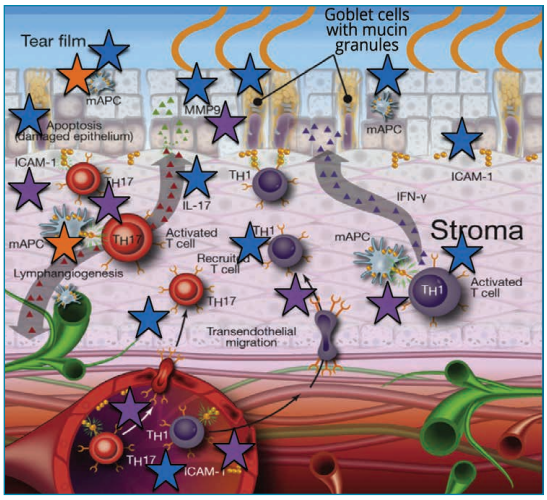


Figure 3. Mechanisms of action of Restasis (blue stars), Xiidra (purple stars), and HydroEye (orange stars).

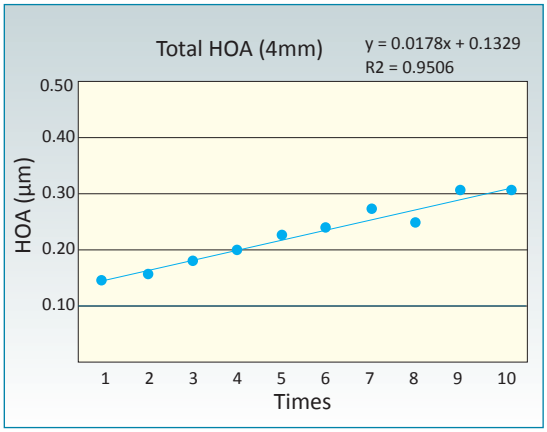


Figure 4. When dry eye is present, higher-order aberrations increase as shown by the blue line in the graph.

(a naive T-cell becomes an activated T-cell), a T-cell response phase with four parts: (1) adhesion, (2) migration, (3) activation and cytokine release, (4) and a chronic, self-perpetuating damage phase that trips the cycle of aberrant activation all over again in a chronic, downward spiral. The pharmacologic strategies we employ to combat this saga have specific targets and impacts.

Figure 3 visually represents the mechanisms of action of Restasis (cyclosporine, Allergan) and Xiidra (lifitegrast, Shire), as well as HydroEye (ScienceBased Health), based on peer-reviewed literature. The gamma linolenic acid (GLA) in HydroEye has some interesting immunopathophysiologic calming effects. In addition to promoting the development of anti-inflammatory prostaglandins and leukotrienes[2] when given in proper ratio with DHA and EPA,[3] GLA can also calm dendritic cell activation[3] as well as directly stimulate tear production from the lacrimal gland via activity on the beta-adrenergic receptor.[4]

Despite the fascinating complexities of dry eye disease immunopathophysiology, it is possible for treating physicians to employ the KISS principle — keep it super simple — to bring relief to patients.

K is for Keratitis

If you are just beginning to treat dry eye, all you need is a Bio-Glo strip (Accutome), with one drop of liquid 1% lissamine green (compounding pharmacies) on one side and a squirt of preservative-free sterile saline on the other side of the strip. Allow the excess to drip off the end of the strip. Turn the strip vertically and gently tap the posterior aspect of each lower lid margin. This technique prevents flooding of dye and masking of findings while efficiently identifying the OSD staining pattern of the conjunctiva (lissamine green staining viewed shortly after instillation under white slit lamp light) and the cornea (superficial punctate keratitis viewed with fluorescein under blue slit lamp light properly viewed starting 90-120 seconds after instillation), just as your careful external exam and optic nerve exam is being completed. Fluress (Akorn), used in checking IOP with a Goldman tonometer, is not enough fluorescein to see the staining pattern. In a short period of time, the stains provide a great deal of information about the ocular surface. Tear break-up time measures tear stability with fluorescein under blue light as the interval of time between a complete blink and the appearance of the first black area. An incomplete tear, wet and spread across the cornea, suggests a significant loss of mucin, produced by goblet cells. This finding pushes me to reach for goblet cell density-improving therapeutics as well as benzalkonium chloride (BAK)-minimizing strategies.

I is for Image and Illuminate

A picture is worth a thousand words, and that saying is also true in our specialty. I appreciate the power of a slit lamp camera with a photo management system, because in real time, I can capture and share a communication-enhancing image with the patient. The meibography feature of the LipiView ocular surface interferometer imaging technology (TearScience) helps us efficiently demonstrate the anatomic impacts of meibomian gland dysfunction (MGD). Patients quickly grasp the magnitude of their gland compromise when shown a photo of normal meibomian glands compared with their own.

As vision starts with the tear film (the first refractive interface), OSD is a vision-impacting disease. When the tear film is disrupted, quality of vision is affected, which not only creates problems for patients, but also wreaks havoc on your refractive surgical practice and premium IOL practice. Wavefront analysis is a fast and easy method to judge the visual impact of the ocular surface. In the presence of dry eye disease, higher-order aberrations increase in between blinks (Figure 4). I've found that sharing these images helps patients feel heard in their complaints, builds the doctor-patient relationship, and helps the patient to understand the relationship between DED and their visual fluctuations.

A fast and simple tool to illuminate ocular structures is your trusty muscle light. With the patient at the slit lamp, turn off the room light and slit lamp light, position the muscle light at the lash base of the lower lid, and use the light to gently evert the lid and transilluminate the meibomian glands. You'll

be amazed at how much MGD you have missed compared with just using your slit lamp.

You can also efficiently use your muscle light to reveal an incomplete lid seal. To look for this common finding, which contributes to symptoms of irritation upon awakening, have the patient close his eyes and relax his face, then place the muscle light gently at the superior tarsus, aimed inferiorly at the interpalpebral fissure. If light leaks "under the door" at the interpalpebral fissue, that is an inefficient lid seal and a $50 nighttime silicone mask (Eyeseals, Eye Eco) is an easy KISS fix to this common component of OSD.

S is for Salt and Swamp

Patients with OSD often have hyperosmolar tears ("salt") as well as dirty tears ("swamp") full of inflammatory mediators as discussed above. How do we assess the salt load?

The TearLab Osmolarity test is a rapid point-of-care test that quickly provides a snapshot of how healthy or unhealthy the tear film is. It enables me to understand the high-symptoms/low-findings patient (often times, these patients are hyperosmolar and the surface damage will come later as the disease progresses).

Osmolarity testing also helps me to track a patient's response to therapeutics over time. Because osmolarity improvements can precede symptom improvements, the physiologic normalization of osmolarity at follow-up visits is a great way to encourage patients to stay the therapeutic course. What's more, tear osmolarity has been found to have a significant impact on preoperative planning and implications for surgical outcomes.[5]

InflammaDry (RPS) is another valuable diagnostic test, as it detects MMP-9, an inflammatory marker that is consistently elevated in the tears of patients with dry eye disease.[6] MMP-9 also increases with increasing disease activity.

The osmolarity and inflammatory load testing tools help determine the quality of the tear film and guide treatment. Our therapeutic mindset is to achieve physiologic restoration with a healthy, free-flowing lacrimal functional unit. Late Stage 3 or Stage 4 DED patients aside, inserting punctal plugs before the inflammatory load is under control may make the patient feel better, but there is goblet cell recovery to consider. Plug insertion performed before tear clean up is achieved (a negative MMP-9) results in a poor quality, inflammatory-mediator-laden tear film being trapped on the ocular surface. The short hand way of describing the physiologic restoration philosophy is "drugs before plugs."

S is for Select and Simplify

We have a full battery of treatment options to help us control the inflammatory load associated with OSD. Restasis and Xiidra are proven effective therapies. Steroids certainly have a role for induction and acute exacerbations, although it will be interesting to see if the steroid-like effect of Xiidra will obviate the need for steroids for pulse dosing and, thus, eliminate the risks associated with steroids, such as cataractogenesis.

Also, take care to choose a nutritional supplement that has scientific data to support its use,[2-4] such as HydroEye.

Restoring the lacrimal functional unit is a philosophical mindset. When I see a compromised ocular surface, my goals and interventions are aimed at restoring the entire homeostasis-maintaining system that Mother Nature designed.

S is for Supply and Support

Your patients will appreciate easy access to the therapies you are recommending, whether you stock them in your office or make them available through an online portal. This also helps prevent patients from wasting money on the wrong products.

Dry Eye Population Skewing Younger

My clinic is located in "Microsoft Valley," and many of my patients with ocular surface disease are younger people who work in the IT industry. Epidemiologic data, including the recent Beaver Dam Offspring Study, show us that symptoms of OSD can be present in much younger patients than the typically older preoperative cataract demographic we commonly associate with OSD. The disease process starts early and often takes years or decades to ramp up. Treating OSD is simpler in the earlier stages and more complex in the later stages. When we mindfully examine patients for this highly prevalent problem and use new diagnostic and imaging technologies, we can identify the disease sooner and take action before substantial signs and symptoms develop.

KISS Timesaver

Our practice uses a patient care checklist of all the therapeutics I prescribe for ocular surface disease. I simply check the prescribed regimen and circle all of the adjunct components. This patient regimen summary sheet saves on patient phone calls to the clinic and in our experience, enhances patient compliance.

Consider giving each patient a starter kit with coupons and information sheets. Also, be sure to direct your patients to reputable online resources. MyDryEyes.com, sjogrens.org, NotADryEye.org, and nei.nih.gov/health/dryeye are great examples. Spend some time yourself on these reputable sites to further your understanding of the significant impacts OSD can have on quality of life. Steer your patients away from blogs — the misinformation prevalent on the Internet is shocking.

S is for Screen and Substitute

Part of your dry eye workup will include gathering a careful and complete list of their current and past medications, some of which may exacerbate their OSD. You can find the chart in the March 2015 issue of *Ophthalmology Management* (Figure 5).[7]

You can train your technician to screen the patient's medication list and cross-reference the drugs to this dry eye disease-exacerbating medication list, and then suggest less drying alternatives within the same class. Within classes of drugs, the highest exacerbators are listed first, and less OSD-offensive drugs are listed lower in each section. For example, diuretics negatively affect the lacrimal gland, and beta-blockers negatively affect the lacrimal gland, goblet cells, and meibomian glands. Asking a patient to check in with his primary care physician (PCP) and discuss possibly switching to a calcium channel blocker or an angiotensin-converting enzyme inhibitor can make a difference in the functionality of the lacrimal functional unit. Clinically, I have found the over-the-counter and prescription systemic medication list and substitutions made with the PCP to be a helpful adjunct in helping the OSD patient.

Systemic Medication Classification

COMMON SYSTEMIC MEDICATIONS THAT PROBABLY CAUSE DTS

		Generic Name	Trade Name	DTS Mechanism
Medication class: Listed by most exacerbating to least exacerbating within each class	Antidepressants			Muscarinic receptor antagonism decreases lacrimal gland output. SSRIs have fewer severe anticholinergic effects than TCAs
	TCAs	amitriptyline nortriptyline doxepin	Elavil Pamelor Sinequan	
	SSRIs	fluoxetine fluvoxamine sertraline paroxetine citalopram escitalopram	Prozac Luvox Zoloft Paxil Celexa Lexapro	
	NDRI	bupropion	Wellbutrin	
	NaSSAs	mirtazapine	Remeron	Remeron shows lower incidence of dry mouth than TCAs and SSRIs
	Anxiolytics	diazepam alprazolam lorazepam	Valium Xanax Ativan	Anticholinergic profile limits lacrimal gland output
	Benzodiazepine Hypnotics	zolpidem zopiclone eszopiclone	Ambien Imovane Lunesta	
	Antihypertensives	hydrochlorothiazide (HCTZ) metoprolol and other beta blockers		Decreased intravascular volume limits tear production by lacrimal gland
	Hormone manipulators	leuprolide	Lupron	LHRH analog that decreases sex hormones (especially testosterone), impacting meibum production, leading to increased evaporative tear losses
	Neuromuscular junction blockade	botulinum toxin	Botox, Xeomin	Decreased blink forces may limit tear spread and meibum delivery
	Anticholinergics and dopaminergics for Parkinson's disease	benzhexol pramipexole levodopa benztropine	Artane (anticholinergic) Mirapex (dopamine agonist with anticholinergic effects) Sinemet Cogentin	Anticholinergics and anticholinergic profiles of dopaminergic agonists decrease lacrimal gland output
	Antipsychotics			
	Typical	chlorpromazine thioridazine haloperidol	Thorazine Melleril Haldol	Anticholinergic profile limits lacrimal gland output
	Atypical	clozapine risperidone quetiapine aripiprazole	Clozaril Risperdal Seroquel Abilify	

Figure 5. Cross-reference patients' current and past drugs with those that are known to exacerbate OSD. Current OSD-exacerbating drugs can sometimes be substituted for less offending drugs.

In Summary

OSD is a complicated disease, but it doesn't have to be complicated to manage. My advice to anyone still sitting on the sidelines is to dive in and get started with staining. Add on diagnostics as you can. You don't have to make an overwhelming investment; just start somewhere, and your dry eye practice will grow naturally and evolve. I hope you find your OSD management journey to be as enjoyable and rewarding as I have. ■

References

1. The definition and classification of dry eye disease: report of the Definition and Classification Subcommittee of the International Dry Eye WorkShop (2007). *Ocul Surf*. 2007;5:75-92.

2. Kapoor R et al. Gamma linolenic acid: an antiinflammatory omega-6 fatty acid. *Curr Pharm Biotechnol*. 2006;6:531-534.

3. Sheppard JD, Pflugfelder SC, et al. Long-term supplementation with n-6 and n-3 PUFAs improves moderate-to-severe Keratoconjunctivitis Sicca: A randomized double-blind clinical trial. *Cornea*. 2013;32:1297-1304.

4. Pholpramool C. and Tangkrisanavinont V. Evidence for the requirement of sympathetic activity in the PGE1-induced lacrimal secretion in rabbits. *Arch Int Pharmacodyn Ther*. 1983 Sep;265(1):128-137.

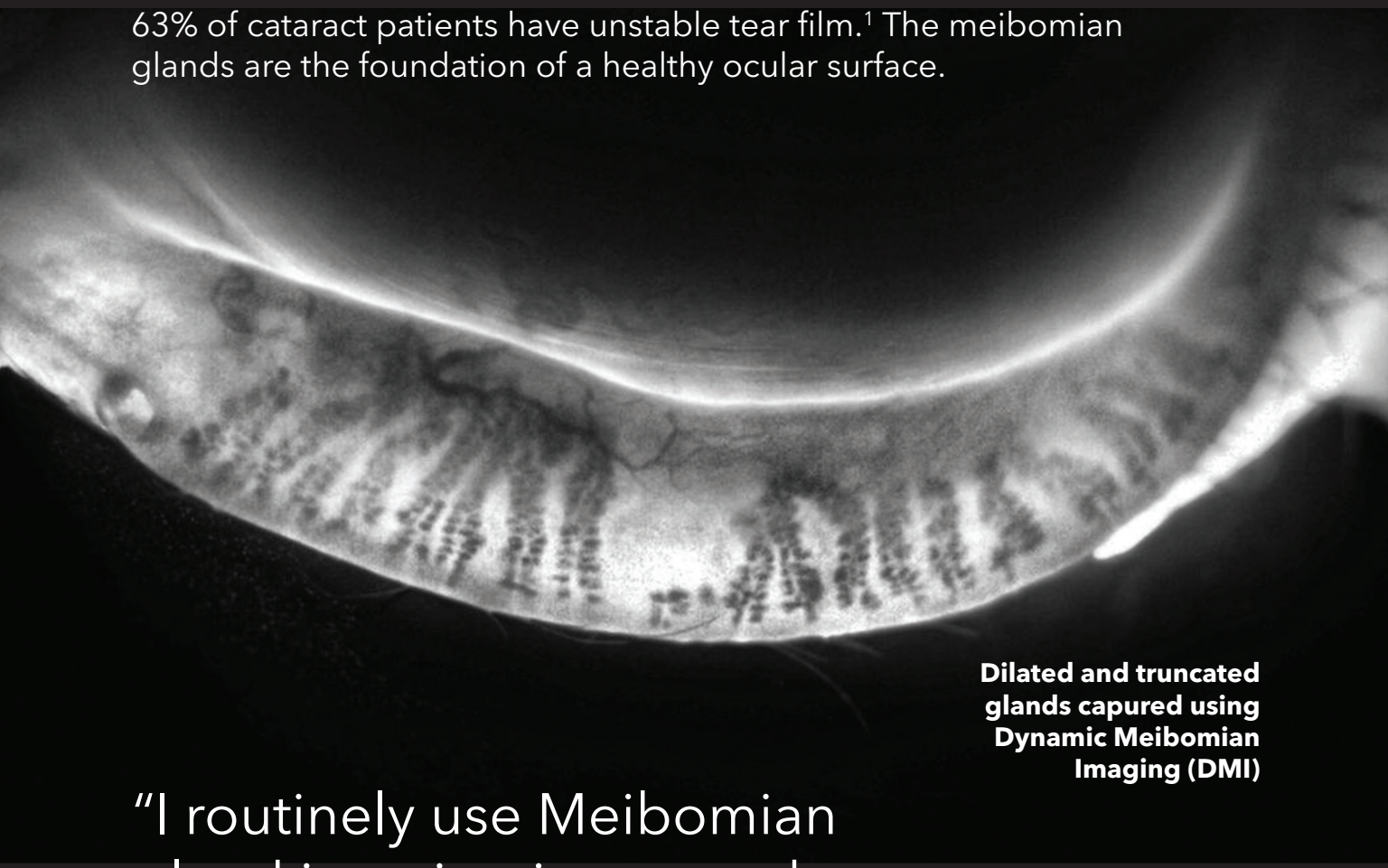
5. Epitropoulos AT, Matossian C, Berdy GJ, Malhotra RP, Potvin R. Effect of tear osmolarity on repeatability of keratometry for cataract surgery planning. *J Cataract Refract Surg*. 2015;41:1672-1677.

6. Chotikavanich S, de Paiva CS, Li de Q, et al. Production and activity of matrix metalloproteinase-9 on the ocular surface increase in dysfunctional tear syndrome. *Invest Ophthalmol Vis Sci*. 2009;50:3203-3209.

7. Periman L. Safeguarding the cornea: Clues to DTS may lurk on meds list. *Ophthalmology Management*. 2015;19:36-39.

Are you optimizing your surgical protocol?

63% of cataract patients have unstable tear film.[1] The meibomian glands are the foundation of a healthy ocular surface.



Dilated and truncated glands capured using Dynamic Meibomian Imaging (DMI)

"I routinely use Meibomian gland imaging in my work-ups."

Preeya K. Gupta, MD
Duke Eye Center

919-459-4880 | tearscience.com | **sales@tearscience.com**

LipiFlow® BY TEARSCIENCE

1. Trattler WB, Reilly CD, Goldberg DF, et al. Cataract and Dry Eye: Prospective Health Assessment of Cataract Patients Ocular Surface Study , Presented at ASCRS 2011 [http://tinyurl.com/jurj3ra]

MKT-ADV-017 A

LOOKING BEYOND THE SYMPTOMS

By Mary Davidian, MD

Clinical skills coupled with empathy create a healing environment for patients with dry eye

As an ophthalmologist with dry eyes, I know I am not alone among my colleagues. If you have this disease, you know it has a profound effect, not only on you, but also on your relationship with your dry eye patients.

When I share my personal story with my patients, they are relieved to know that I understand what they're experiencing and that it is possible to find relief. I am sharing my story with you, so that those of you who are not personally affected by dry eye can appreciate the impact it has on quality of life as well as ocular health. In addition, I offer some insight into the psyche of the dry eye patient and provide a few tips on how to improve adherence with recommended therapy.

Denial: A Common Patient Reaction

For many years, I didn't take my dry eye seriously. Occasionally, I would use artificial tears when my symptoms were severe, and I would think, "It's really not that bad" and "I don't have time for this."

About 2 years ago, however, my eyes were so dry that my contact lenses became extremely uncomfortable — so much so that I had to remove them before the end of the day. This caused me to have a panic attack. How could I perform surgery if I couldn't wear my contact lenses? I knew I had to take action.

I began a regimen of treatments that improved my symptoms significantly. Shortly thereafter, I had the privilege of hearing Patti Barkey, CEO/administrator of Bowden Eye & Associates, and her group discuss how to start a Dry Eye Center of Excellence, which motivated me to implement a dry eye clinic in my office, because, clearly, there is a need for it.

Erase the Stigma, Improve Adherence

I think it is fair to say that there is a stigma associated with dry eye disease. Often, physicians send patients home with a collection of different artificial tear products to "see what works." When patients return and report that they're still uncomfortable, they may feel like complainers or become convinced that they are blowing their symptoms out of proportion. As a result, patients often lapse into denial and avoid treatment.

As an example, I recently attended a family event, and when I told an older cousin, a business executive, that I would be speaking about dry eye disease at a professional meeting, he smirked and asked, "Is that really a disease?" This seems to be the prevailing attitude, even among educated people — including some physicians — and, as one who has suffered, I can tell you wholeheartedly that, yes, it is a disease and those who have it really need your help.

The first step toward helping dry eye patients is reassuring them that they have a real disease that needs to be treated. If you also have dry eye disease, speaking to patients about your own situation may help them understand and adhere to treatment. I don't have this discussion with every patient I treat or I would never go home at night, but when a patient is frustrated and having difficulty adhering to treatment, I may share my personal experiences and how I have managed my disease. This brings the topic down to a personal level, making it more like two friends discussing a mutual problem rather than a doctor lecturing a patient.

Anything that legitimizes what patients are feeling will improve compliance. Many patients may have seen doctors who did not take them seriously, so when they find a doctor who does, they are truly grateful — and more likely to follow that doctor's recommendations.

Address Patients' Treatment Concerns

Patients may have concerns about the potential side effects of drugs, and some insist on not taking any drugs because they follow a holistic lifestyle. Again, I share my own attitude and experience, explaining that I, too, try to avoid taking drugs whenever possible. But, I found that artificial tears alone did not improve my symptoms. Ultimately, using Restasis (cyclosporine, Allergan) twice a day really helped me. I emphasize the safety of the therapies I prescribe, explaining, for example, that there is no

increased risk of glaucoma or cataracts with Restasis, and studies have shown the drug is not absorbed systemically.[1]

In addition, patients may have concerns about the time commitment involved with dry eye treatment. As they watch me do loops around the office, I say, "Yes, I know what it's like to be really busy," and I share some suggestions to help them incorporate treatment into their daily routines.

For example, I store my Restasis in a little paper cup and place it next to my toothbrush (Figure 1). I know that I will brush my teeth every morning and evening, and even if my kids come into the bathroom to talk to me while I am brushing my teeth and I am totally distracted, I have a visual cue to remind me to use the medication.

One of my colleagues also uses this method as a reminder to use Xiidra (lifitegrast, Shire) twice a day. She noted that Xiidra leaves a slight taste in her mouth, and brushing her teeth right away helps eliminate that taste, which also helps her to be compliant.

Patients may also worry that dry eye treatments will be painful. Again, when discussing LipiFlow (TearScience) treatments, I can share my own experience. The treatment takes less than 15 minutes and is painless. I was treated at the end of a busy workday, and was able to drive home in the dark with perfect vision. Hearing this personal experience makes patients more comfortable when considering treatment.

I also emphasize that dry eye is a chronic, multifactorial disease for which there is no single "magic bullet" treatment. Therefore, patients with dry eye disease must follow a multi-pronged treatment regimen. Having one LipiFlow treatment, for example, will not eliminate the need for artificial tears, Omega-3 supplements or prescription medications, and, as a physician, I continue to use these on a daily basis despite being treated with LipiFlow. When patients understand the reason for each intervention, they are more likely to adhere to their recommended dry eye regimen.

Team Approach

Successfully treating dry eye involves a team approach in the office. This starts with the technicians, who must ask the right questions, take detailed histories, and list any treatments that patients have already tried. Every patient leaves our office with written material, including a flow sheet, describing exactly what treatments may be recommended or prescribed, and what to expect from them. This reassures patients that we are taking their disease seriously.

Showing diagnostic test results that confirm the presence of dry eye also can be extremely helpful, particularly for patients who have become frustrated. For example, our technician shows the patient an image of normal meibomian glands and compares it with an image of the patient's meibomian glands as shown by LipiView (TearScience) imaging (Figure 2), pointing out the differences. Patients now have visual proof that they have significant disease and that there is a medical basis for their symptoms.

Value of the Dry Eye Specialist

Sharing my experiences as a dry eye patient has helped me connect with the dry eye patients in my practice on a personal level. I encourage ophthalmologists who do not have dry eye disease to take this process seriously, and to show patients that you sympathize with them and will listen to their concerns.

By establishing a Dry Eye Center of Excellence with a standardized protocol that utilizes all of the diagnostic and treatment options available to us, you will show patients that there is a disciplined approach to treating their disease. This will be a win-win for you and your patients: You will have the satisfaction of knowing you have helped them, and they will refer others to you — their dry eye specialist. ■

Figure 1. Simple visual cues, such as the "paper cup method," can help dry eye patients remember to use their drops.

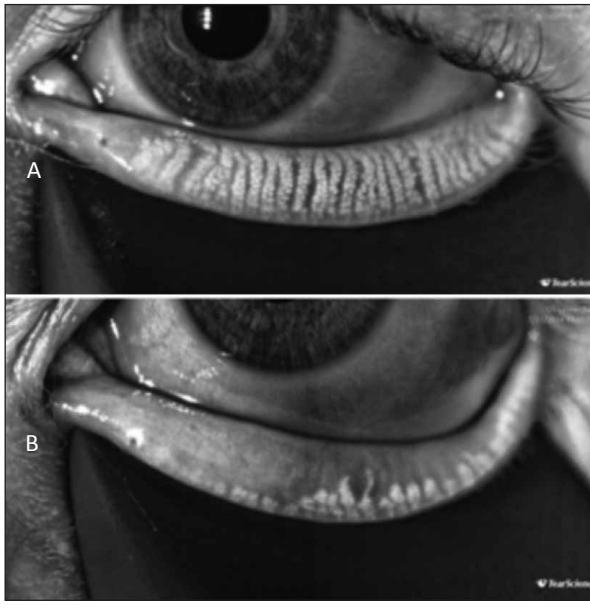


Figure 2. Using LipiView imaging, our technician can explain the differences between normal meibomian glands (A) and dysfunctional glands (B).

Reference

1. Allergan. Restasis package insert.

TREATING DRY EYE WHEN YOU ARE NOT THE "DRY EYE GUY"

By Alan N. Carlson, MD

How to integrate dry eye management into a busy surgical, non-dry eye practice

If you're like me, you may not think of yourself as the "dry eye guy." I may be "the cataract guy," "the LASIK guy," or "the cornea transplant guy," but I am not a specialist in dry eye disease. Yet, invariably we all see dry eye frequently in our practices. Given its prevalence and its impact on so many aspects of ocular health and quality of life, we need to decide how we will address it.

Figure 1. Often, patients referred for cataract surgery dismiss their dry eye symptoms as normal signs of aging.

Find Your Sweet Spot

I often use the three layers of an Oreo cookie as an analogy when discussing different approaches to managing dry eye. Some of us represent the top layer, fully embracing the concept of the Dry Eye Center of Excellence. This level of commitment brings numerous benefits, such as opportunities to be involved in research, to partner with industry, to participate in speaker panels and seminars, and attract patients wanting the most comprehensive approach to their condition. Expanding your practice to include a segment dedicated to dry eye also has the potential to increase revenue and grow your patient base through referrals. Of course, there are some challenges. Physicians and staff must adapt to a new specialty that requires integrating a battery of unfamiliar diagnostic tests and therapies, which they may view as disruptive. In addition, as you make the transition, you must communicate well and manage patients' expectations to avoid confusion and misunderstandings. Patients who have been referred for cataract surgery may not understand why the conversation now involves red eyes and blocked glands.

Some ophthalmologists represent the bottom layer of the Oreo, although I believe this group is dwindling. Treatment is based entirely on symptoms, and severely symptomatic patients are referred to dry eye specialists. In an era when awareness of the importance of treating dry eye patients is growing, this may not be the best approach. When I diagnose dry eye in new patients and start them on a treatment regimen, their number one question is, "Why wasn't I treated sooner?" So, in addition to compromising a patient's ocular health in the face of this progressive disease, you risk your reputation and that of your practice when you're not actively involved in diagnosing and managing dry eye.

Personally, I have chosen the middle layer — or, as I like to call it, "the sweet spot." By reducing the number of days that I operate from four to three, I can continue to be a surgeon, while better integrating ocular surface

BRUSH. FLOSS. AVENOVA®.

Avenova. The essential part of any lid hygiene regimen.

Antibiotic and resistance free Avenova with Neutrox®. The one no-sting solution that helps manage the itchy, burning, irritated eyelids often caused by blepharitis, MGD and dry eye. Used alone or concomitantly, Avenova is the essential part of any lid and lash hygiene regimen. Avenova. Every day.

Avenova®

Daily lid and lash hygiene.

Avenova contains Neutrox, a proprietary pure hypochlorous acid that mimics the body's immune response. It works without creating mammalian cell toxicity or bacterial resistance. It's well tolerated for daily use.

AVENOVA.COM | 1-800-890-0329 | RX ONLY

Raising Awareness

When you incorporate dry eye disease into your practice, regardless of your level of commitment, be prepared to raise awareness among your patients, particularly those who may have come to you for something other than dry eye. For example, a retired OB/GYN surgeon was referred to me for cataract surgery. He traveled to my office in Durham, N.C. from his home in Knoxville, Tenn. — about a 5-hour drive. During his preoperative examination, I noted signs of meibomian gland dysfunction and asked him about symptoms. He responded that his eyes were red "all of the time." I postponed his surgery so we could address his ocular surface. We treated his eyelids and sent him back to Knoxville with a treatment regimen to improve the condition of his lids and ocular surface, and rescheduled his cataract surgery 3 weeks later.

and dry eye management into my busy practice. I've found that recommending nutritional supplements, along with LipiFlow (TearScience) and meibomian gland imaging, has been minimally disruptive and I can successfully manage more than 90% of patients diagnosed with dry eye.

Proactive or Reactive Approach?

My approach to treating a patient recently diagnosed with dry eye will be based on the following:

a) symptoms
b) findings on examination
c) recent or upcoming surgical procedures.

Ideally, I prefer treating earlier in the disease process — being proactive rather than reactive. Consider, for example, what appears to be an asymptomatic cataract patient (Figure 1). Upon examination, I find most of these patients are actually symptomatic, but they dismiss their symptoms as a normal process associated with aging. So, we have a discussion, and together we decide if we will proactively treat the dry eye prior to surgery, which is usually preferable. Some patients prefer to hold off on treatments, particularly if their treatment involves an out-of-pocket expense. By having the discussion prior to surgery, patient expectations are established and documented. Introducing this discussion after surgery rather than before surgery can be seen as a complication by the patient.

Furthermore, treating the ocular surface before surgery offers the benefit of improving the accuracy of IOL selection, which is even more critical in the premium IOL patient. If the patient tells me the dry eye treatment I am recommending is not in his or her budget at that time, I explain the potential ramifications of waiting: "Just be aware that cataract and corneal surgery (LASIK) impacts the ocular surface with irrigation, medications, and incisions that cut nerves. Premium intraocular lenses, particularly diffractive multifocal lenses, require a stable tear film and ocular surface for the best possible outcome."

Dry Eye Disease: Then and Now

Not long ago, the belief was that dry eye was primarily the result of insufficient tear production, in many cases, linked to hormonal changes. Treatments, including artificial tears, punctal plugs, and Restasis (cyclosporine, Allergan), were directed toward alleviating dry eye symptoms.

Today, we know that dry eye is much more than tear quantity and includes tear quality and instability, the lipid component has become our focus. We, as doctors, have become more proactive in educating our patients and in recognizing, diagnosing, and treating this disease that can degrade ocular structures over time.

This is not complicated. When the basis for a patient's dry eye is mechanical — an obstruction — I treat it with LipiFlow, a therapy that is extraordinarily effective in 93% of my patients. I refer the remaining 7% to my dry eye specialist at Duke. We also have a rheumatologist at Duke, whose entire practice consists of managing Sjögrens Syndrome.

Transition to Maintenance

Once meibomian gland dysfunction has been addressed, patients should start a maintenance regimen. One important component is daily eyelid and eyelash hygiene. I recommend Avenova (NovaBay) lid and lash cleanser, a product that I use even though I don't have a severe dry eye problem. I also recommend that patients add the nutritional supplement HydroEye (ScienceBased Health) to their daily routines.

LipiFlow is also an effective maintenance therapy. The average patient returns for treatment about every 3 years. Although it's more costly than artificial tears, this therapy is effective over the long term, and if patients think of it in the context of the cost of a cup of Starbucks coffee per day, they can appreciate its value. In fact, one of my patients has been coming to my office for a LipiFlow treatment about once a year for the past 5 years. She doesn't want the dry eye symptoms she experienced in the past to recur, so she makes room in her budget for this therapy.

Choose Your Level of Involvement

If you're a busy surgeon, you may not want or need to add all of the available dry eye therapies to your practice. But, given what we know about the consequences of dry eye disease, I believe it is incumbent upon us to take an active role in its management. The exact role and degree of involvement can be unique to each of us. ■

DRY EYE NEVER FELT SO GOOD.

Artificial tears aren't always enough to alleviate the symptoms of dry eye. Give your patients a new perspective with Bio-Tissue's family of options for facilitating quality healing on the ocular surface in mild to severe cases. Go beyond hydration to rejuvenation — and see dry eye from a whole new point of view.

RETHINK DRY EYE
biotissue Happy Eye SYNDROME

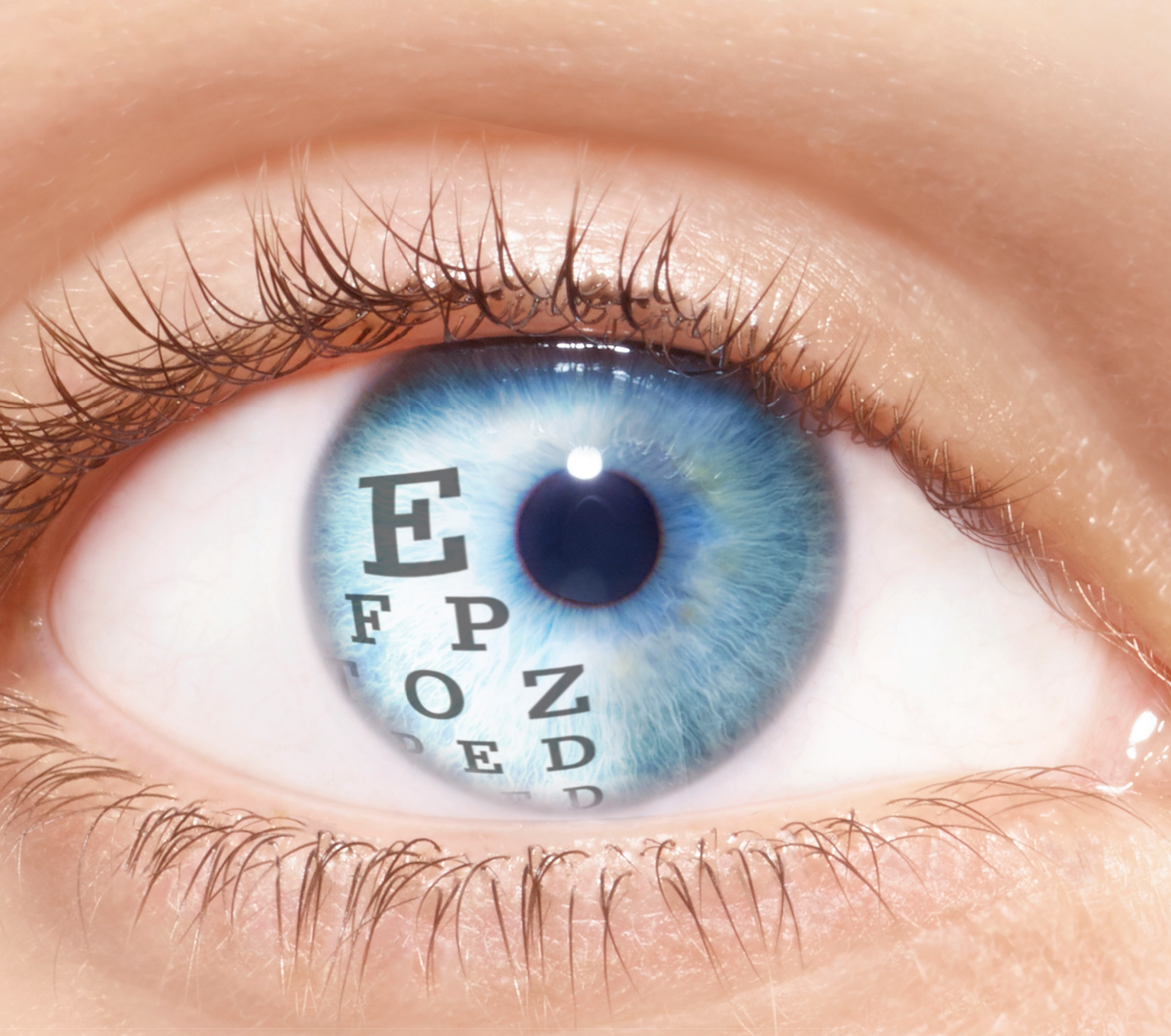
For more information please visit: **www.biotissue.com/dryeyeinfo.**

AMNIOGRAFT® BIOLOGIC OCULAR TRANSPLANTATION GRAFT

Cliradex® Naturally Fresh, Healthy Eyes

PROKERA® BIOLOGIC CORNEAL BANDAGE

biotissue™



YOUR PATIENTS' EYES TAKE IN A LOT.

Sometimes it's not all good. **SYSTANE® BALANCE Lubricant Eye Drops** are scientifically formulated to work on all 3 layers of the tear film, protecting the ocular surface with ingredients that **increase lipid layer thickness by 40%**.*,[1]

Recommend SYSTANE® BALANCE to your patients for the temporary relief of dry eye symptoms, and see how science leads to real relief.

The Relief is Real

*Prospective, randomized, double-masked, single-dose, contralateral eye study, N=40. Lipid layer thickness was measured in nanometers, and baseline measurement was 63.38.

1. Korb D, et al. Evaluation of extended tear stability by two emulsion based artificial tears. Poster presented at: 6th International Conference on the Tear Film and Ocular Surface: Basic Science and Clinical Relevance; September 22-25, 2010; Florence, Italy.