

MY ALGORITHM FOR DED

Our experts' go-to therapies deconstructed.

BY NEDA SHAMIE, MD; ALICE T. EPITROPOULOS, MD; ELIZABETH L. YEU, MD;
P. DEE G. STEPHENSON, MD; SHERI ROWEN, MD; AND CATHLEEN McCABE, MD



NEDA SHAMIE, MD

- Individualize treatment.
- Assess inflammation.
- Prescribe a 2-week course of steroids plus 3 to 6 months (and often longer) of cyclosporine ophthalmic emulsion 0.05% (Restasis; Allergan) twice a day.
- Increase the patient's intake of omega-3 fatty acids.
- Look for comorbid conditions (eg, conjunctivochalasis, incomplete blink reflex, etc.).

Patients who rely daily on artificial tears deserve a closer evaluation to rule out dysfunctional tear syndrome or monitoring for progressively worsening symptoms. A customized approach is important. The patient may have significant meibomian gland dysfunction (MGD), ocular surface inflammation as a result of underlying allergies, or possibly conjunctivochalasis or other mechanical abnormalities that can contribute to ocular surface disease (OSD). The most likely scenario is a combination of factors.

After determining the presence of inflammation, based on clinical presentation or the use of InflammDry (Rapid Pathogen Screening), I prescribe a 2-week course of steroids. My preference is loteprednol etabonate ophthalmic ointment 0.5% (Lotemax; Bausch + Lomb) administered at bedtime, with at least 3 to 6 months of therapy with cyclosporine. I also advise my patients to increase their intake of omega-3 fatty acids through supplementation; Physician Recommended Nutraceuticals is my preferred brand. In addition, I suggest to my patients that they add more omega-3 fatty acids to their diet.

If significant rosacea is present, I prescribe 50 mg/day oral doxycycline for at least 3 months or topical azithromycin (AzaSite; Akorn) nightly. If there is trichiasis, I remove those lashes. If the patient has conjunctivochalasis and symptoms of discomfort remain despite aggressive treatment of the

ocular surface, I proceed with conjunctival resection. For patients with severe punctate epitheliopathy or dry eyes related to neurotrophic keratopathy, I recommend autologous serum drops. I offer the option of a PROSE (prosthetic replacement of the ocular surface ecosystem) scleral lens to patients who experience little to no improvement with topical treatments.



ALICE T. EPITROPOULOS, MD

- Assess the patient for an unstable tear film.
- Initiate early treatment.
- Administer the Standard Patient Evaluation of Eye Dryness (SPEED) questionnaire.
- Increase the patient's intake of omega-3 fatty acids.
- Tailor treatment to the severity of the disease.
- Prescribe a topical corticosteroid with cyclosporine.

The tear film is the most important refractive surface of the eye. Instability can render biometry unpredictable, delay healing, and lead to suboptimal results after surgery. Evaporative DED is the most common form of OSD.¹ In my opinion, this condition is what causes some patients to be frustrated, dissatisfied, or unhappy with the results of cataract or refractive surgery.

MGD is a progressive disease. If not treated, it can lead to glandular atrophy and loss of function. In my experience, meibography using the LipiView II Ocular Surface Interferometer (TearScience) is an excellent tool with which to identify these patients early, and it also serves as a great opportunity to educate patients and guide the discussion about the disease. I think LipiView II is what will take LipiFlow (TearScience) thermal pulsation to the next level. Patients can now see what their glands look like ver-

sus what they should look like. Conventional treatments do not address meibomian gland obstruction.

There are several traditional but valuable ways of evaluating DED. I have found tear breakup time, (TBUT) corneal topography, and fluorescein staining to be most helpful. Options have changed dramatically during the past several years owing to the improved specificity and objectivity of point-of-care testing. OSD results in hyperosmolarity, which in turn contributes to an unstable tear film, the hallmark of DED.

Treatment should be tailored to the severity of the disease. Reducing inflammation is the primary goal of treating moderate to advanced DED. Cyclosporine is extremely effective in my patients with DED, because the drug increases natural tear production and slows disease progression. A topical corticosteroid can rapidly reduce inflammation and work synergistically with cyclosporine. I also recommend omega-3 fatty acids, because they reduce inflammation and increase tear production.² I prefer re-esterified nutritional supplements from Physician Recommended Nutraceuticals, because they are a high-quality, purified, triglyceride formulation and I find them to have excellent tolerability and absorption.

Blepharitis is a common diagnosis associated with DED. Conventional treatments such as cleaning the lids with baby shampoo can sometimes exacerbate symptoms. A new approach, Avenova (NovaBay Pharmaceuticals), uses hypochlorous acid in saline, which is a bactericidal component found in white blood cells. I have found this treatment to be extremely effective for patients with MGD and blepharitis.

DED decreases surgical predictability and can adversely affect outcomes. I never hesitate to delay surgery until the ocular surface is healthy enough to generate accurate measurements.



ELIZABETH L. YEU, MD

- Listen to the patient.
- Assess the causes of OSD, which are likely multifactorial.

The diagnosis and management of dry eye disease (DED) have blossomed in the past several years. Bearing in mind the patient's symptomatology is just as important as incorporating the diagnostics and clinical examination into the big picture.

For example, the timing and qualities of the patient's discomfort can be very revealing. The patient with OSD who complains more of a burning sensation first thing in the morning from MGD is very different from one who suffers from fluctuating foreign body sensation that worsens throughout the day due to aqueous-deficiency issues. Likewise, a patient with MGD who feels bilateral burning in his or her eyes differs

from a patient with recurrent corneal erosion syndrome who experiences unilateral, sharp pains and tearing.



P. DEE G. STEPHENSON, MD

- Listen to the patient.
- Administer the SPEED questionnaire.
- Evaluate tear osmolarity and use the InflammDry test.
- Treat with cyclosporine, omega-3 fatty acids, and topical steroids.
- Consider new treatments for blepharitis such as the BlephEx (RySurg).

DED can be extremely burdensome to both the patient and the doctor. It is a real disease, and the treatment is ever changing and long term. A good game plan is a must, along with patience, empathy, and listening to the patient describe his or her symptoms. Nearly all of my patients complete the SPEED questionnaire. It is important to determine what type of disease the patient has or if it is a combination.

I perform a corneal evaluation using fluorescein staining and a conjunctival evaluation with lissamine green as well as TBUT testing. I also assess the meibomian glands. I examine the lid margins for *Demodex*, greasy lashes, and lash loss. Treating the inflammatory component of the disease is important. I prescribe cyclosporine, omega-3 fatty acids, and topical steroids to reestablish the tear film. I use punctal plugs if needed.

An evaluation of the meibomian glands and the oil layer of the tear film is crucial. I use the LipiView II and LipiFlow treatment as needed. I perform a DED workup on preoperative cataract patients and treat the disease aggressively so that optimal preoperative testing can be performed.

BlephEx is a great new addition to the treatment options for blepharitis. This in-office procedure helps improve MGD and symptoms of DED by removing the excess bacteria biofilm and inflammatory exotoxins along the lid margin.



SHERI ROWEN, MD

- The importance of lid hygiene is underrecognized.
- Early recognition of MGD is needed.
- Glands should be expressed manually at the initial office visit.

We ophthalmologists have missed the importance of lid hygiene. With the rapidly increasing prevalence of dysfunctional tear syndrome, we need to take a second look. Every

patient should be evaluated in his or her 20s to 30s to determine who will be at risk for plugged glands.

Every patient who walks into our practices should routinely have the following diagnostic tests performed. First, a SPEED questionnaire to determine if symptoms exist. If positive (> 6), these patients should have their tear osmolarity tested. InflammADry should also be performed to assess inflammation, along with fluorescein staining (with a fluorescein strip only and balanced salt solution to evaluate the staining), and TBUT should be measured.

If patients are suffering from inflammation, I direct them to use cyclosporine drops twice daily and omega-3 supplements as needed for anti-inflammatory effect and to improve the composition of the oil film. I add loteprednol etabonate as well. If only the glands are affected, I will have the patient imaged using the LipiView II to examine the meibomian glands and assess the oil layer. The Keratograph corneal topographer (Oculus) can also evaluate TBUT.

I examine the lid margins for flaking and anterior blepharitis, and if it is present, I institute lid scrubs and warm compresses. I have found that Avenova is effective at killing *Staphylococcus*. I believe that every patient should have manual meibomian gland expression performed at the initial office visit. This will reveal the preliminary level of blockages and the composition of the oil, which will range from olive oil to complete blockage with no oil expressed. I cannot stress enough how important this step is and how rarely it is performed. The dysfunction and blockages of the meibomian glands very often precede the signs and symptoms, and we clinicians must start to focus on early diagnosis and prevention. This would mimic the dental hygiene model: we would evaluate and then express meibomian glands early to prevent long-term blockages, dilation, truncation, and permanent atrophy.

Early treatment with LipiFlow or intense pulsed light can be instituted to unblock the meibomian glands, and their manual expression every 3 months with a cotton swab will prolong the effect until the glands finally produce normal oil. This process can take as long as 2 years in patients with severe disease.

Following treatment with cyclosporine for at least a month, a Schirmer test can be performed; if results are low, plugs can then be placed. I find that pretreatment with cyclosporine helps to reduce the inflammatory mediators that are residing in the tear lake.

In 86% of patients, the meibomian glands will be affected, and as soon as they are expressed to assess the quality and quantity of the secretions, they can start performing again.¹ Until now, expression was not a part of the normal eye examination, but we can make a big difference by just recognizing MGD, especially earlier in patients' lives. Owing to limited and partial blinking, especially with digital devices, the meibomian orifices actually become keratinized, eventually leading to blockages. These can be released

through light debridement with a spud or BlephEx and with expression. I predict routine meibomian expression with control of inflammation will become the new norm for eye examinations and lid hygiene, with the creation of a new specialty of ocular hygienists.



CATHLEEN M. McCABE, MD

■ Top 13 Practice Pearls

- No. 1. Early recognition and treatment are key. Look carefully for signs and symptoms even in younger patients. This is especially important in patients prior to refractive or cataract surgery to improve the quality of measurements and the outcome of surgery. This also helps avoid the misconception that patients have about the cause of the problem if DED is only identified, discussed, and treated after surgery, even though it was present before.
- No. 2. An intake questionnaire (in my practice, we use a modified SPEED questionnaire) empowers technicians to perform important testing (tear osmolarity, staining of the conjunctiva, and cornea) prior to seeing the doctor.
- No. 3. Evaluation of the quality and quantity of meibum can be easily performed in the office with pressure on the lower lid.
- No. 4. Low-tech equipment, such as a slit-lamp photograph taken with a smartphone camera, can be very useful in educating the patient on the problem.
- No. 5. Patients' understanding of the symptoms of DED (tearing, fluctuating vision, burning, redness) can improve their compliance with treatment and follow-up. Educational posters and videos in the waiting room and exam rooms can be very helpful.
- No. 6. High-quality, bioavailable omega-3 fatty acid supplements are a powerful aid in improving MGD. I also discuss sources of omega-3s (fatty fish, walnuts, chia seeds, etc.). I usually advise the patient that it can take 4 to 6 weeks to notice an improvement in DED, and I will re-evaluate him or her around this time.

- No. 7. To help patients with symptoms exacerbated when reading or on the computer, I recommend the “20/20 rule”: every 20 minutes put in a lubricating drop and close your eyes for 20 seconds. For presbyopes, I also recommend looking at distance (approximately 20 feet).
- No. 8. There are apps available for smartphones and tablets that will remind patients to put in drops at regular intervals. Time Out (available in the Apple App Store) will fade the computer screen out to a color at set intervals for a set amount of time (eg, every 20 minutes for 20 seconds).
- No. 9. For patients with more severe DED symptoms who have difficulty instilling drops, lubricating gel in a tube (Systane or Genteal [both from Alcon]) used in smaller amounts during the day can be effective. I warn the patient that his or her vision will be blurry for 1 to 2 minutes after instillation. A gel formulation can be much easier to administer for patients with difficulty extending their neck, because it can be instilled with the head in an upright position.
- No. 10. Microwave-heated compresses, such as the Bruder Moist Heat Compress, make complying with warm compress treatment easier for patients. An inexpensive alternative is to put several clean washcloths in a bowl with water, heat the bowl of water in the microwave, and serially remove the compresses to maintain a warm temperature on the lids. Reheating a baked potato in the microwave after pricking the skin also works well.
- No. 11. Briefly explaining how cyclosporine works (by down-regulating receptors on inflammatory cells to interrupt the inflammatory cycle that exacerbates DED) helps patients to understand the importance of compliance with twice-daily dosing and the reason for the 2 months of treatment required before they notice an improvement in symptoms. I schedule the follow-up visit at 2 months and emphasize that treatment will be long term.
- No. 12. In cases of very severe and persistent DED, I have found serum tears and Prokera Slim amniotic membrane (Bio-Tissue) therapies to be very effective.
- No. 13. Effective evaluation and treatment of DED can be achieved without high-tech diagnostic and treatment tools. It is a great service to the patient to look

early, treat early, and follow up frequently in cases of DED, in hopes of preventing the more end-stage disease we frequently see presenting to our clinics. ■

1. Lemp MA, Crews LA, Bron AJ, et al. Distribution of aqueous-deficient and evaporative dry eye in a clinic-based patient cohort: a retrospective study. *Cornea*. 2012;31(5):472-478.
2. Bhargava R, Kumar P, Kumar M, et al. A randomized controlled trial of omega-3 fatty acids in dry eye syndrome. *Int J Ophthalmol*. 2013;6(6):811-816.

Neda Shamie, MD

- associate professor of ophthalmology at the University of Southern California (USC) Eye Institute, Keck School of Medicine at USC
- medical director at the USC Eye Center-Beverly Hills
- medical director at Tissue Banks International
- neda.shamie@med.usc.edu
- financial disclosure: consultant to Alcon, Allergan, Bausch + Lomb, Nicox, Shire, and Tissue Banks International

Alice T. Epitropoulos, MD

- cofounder and owner of The Eye Center of Columbus
- partner at Ophthalmic Surgeons & Consultants of Ohio
- clinical assistant professor at The Ohio State University Department of Ophthalmology
- (614) 221-7464; aepitrop@columbus.rr.com
- financial disclosure: consultant to Allergan, Bausch + Lomb, NovaBay, PRN, Shire, TearLab, and TearScience

Elizabeth L. Yeu, MD

- private practice at the Virginia Eye Consultants in Norfolk, Virginia
- assistant professor in the Department of Ophthalmology at Eastern Virginia Medical School
- eyeu@vec2020.com
- financial disclosure: consultant to Abbott Medical Optics, Alcon, Allergan, Rapid Pathogen Screening, Shire, and TearLab

P. Dee G. Stephenson, MD

- founder and director of Stephenson Eye Associates in Venice, Florida
- associate professor of ophthalmology at the University of South Florida in Tampa
- president of the American College of Eye Surgeons
- (941) 485-1121; eyedrdee@aol.com
- financial interest: none acknowledged

Sheri Rowen MD

- NVision Centers in Newport Beach, California
- (410) 402-0122; srowen10@gmail.com
- financial disclosure: in-house consultant to Alphaeon Strathspey Crown; she also disclosed a financial relationship with Ace Vision Group, Allergan, and Bausch+Lomb

Cathleen M. McCabe, MD

- cataract and refractive specialist practicing at The Eye Associates in Bradenton and Sarasota, Florida
- (941) 792-2020; cmccabe13@hotmail.com; Twitter @CathyEye
- financial disclosure: speaker for Abbott Medical Optics, consultant to Allergan, and speaker for and consultant to Alcon and Bausch + Lomb