SMARTER TESTING IN DRY EYE DISEASE

A practical, technician-driven approach that does not slow clinic flow.

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Dry eye disease (DED) management once consisted of a brief conversation with patients about using artificial tears. Today, DED is one of the most common and, at times, most frustrating, conditions I manage. By the time patients reach my office, many have already tried multiple treatments, seen several providers, and experienced no improvement in their symptoms.

One of the biggest challenges in managing DED is that patients' symptoms frequently fail to correlate with clinical findings. Some individuals are highly symptomatic despite minimal objective signs, whereas others with severe DED report little discomfort. Therapeutic response can also be unpredictable, and treatment can be costly and poorly tolerated. Prior authorizations and the ongoing need for follow-up add to the complexity.

The diagnostic landscape, moreover, has expanded rapidly. Eye care providers now have more tools than ever to diagnose DED, including tear osmolarity testing, inflammatory marker testing, meibography, noninvasive tear breakup time (TBUT), corneal topography and tomography, wavefront analysis, and anterior segment OCT. The question is no longer whether these technologies are useful but where they fit into a busy clinical workflow.

TEST SMARTER, NOT MORE OFTEN

When used thoughtfully, dry eye diagnostics do not slow down the clinic. They can streamline care, improve patients' understanding of their disease, and transform a vague complaint into a defined, treatable condition. In the past several years, I have shifted from relying primarily on slit-lamp findings and patient-reported symptoms to incorporating objective diagnostic testing earlier and more consistently in the evaluation process (see *Three Shifts in How I Use Dry Eye Diagnostics*).

I recommend starting with a symptom questionnaire, such as the Standardized Patient Evaluation of Eye Dryness or the Ocular Surface Disease Index. These tools quickly quantify how DED is affecting patients' activities of daily living and provide a useful baseline for follow-up.

BUILD A TECHNICIAN-DRIVEN WORKFLOW

My patients complete the questionnaire electronically before their visit or, when that is not possible, during check-in. My technicians perform DED testing in a defined sequence before I enter the exam room.

THREE SHIFTS IN HOW I USE DRY EYE DIAGNOSTICS

In the past 3 to 4 years, my diagnostic approach to dry eye disease has changed in three key ways:

- No. 1: I front-load objective testing. Rather than wait for treatment failure, I incorporate objective diagnostics into the evaluation earlier.
- No. 2: I rely on technicians to gather data. A technician-driven workup preserves physician time for interpretation, counseling, and treatment decisions.
- No. 3: I use imaging as an educational tool. Reviewing gland structure, tear metrics, and optical data with patients improves their understanding and supports their adherence to prescribed treatment.

Tear Osmolarity

Tear osmolarity is one of the first objective tests, ideally before any drops are instilled in the patient's eyes or bright slit-lamp illumination is used. Although this rapid, objective assessment of tear film homeostasis does not identify the underlying cause of disease, it helps confirm that DED is part of the clinical picture and gives patients a tangible metric they can understand.

Inflammatory Testing

Matrix metalloproteinase-9 testing is used more selectively, most often when the patient's DED symptoms persist despite ocular lubrication and when considering initiation of antiinflammatory therapy. A positive result helps explain why artificial tears alone have failed to provide symptomatic relief and supports an escalation to prescription therapy.

Meibography

Given the prevalence of evaporative DED related to meibomian gland dysfunction, meibography has become one of the most meaningful diagnostic tests in my workflow. My technicians capture these images before I examine the patient, so I can review gland structure chairside with my patient. Visualizing meibomian gland dropout helps determine the extent of meibomian gland disease and helps patients better understand their condition. When patients see structural changes and gland loss, the importance of early intervention and consistent treatment becomes more apparent, often improving adherence.

Noninvasive TBUT

Noninvasive TBUT provides information on tear film stability without the variability introduced by fluorescein staining. It is particularly helpful early in the workup and for longitudinal monitoring. Like tear osmolarity, this test is best performed before applanation or the instillation of dilating drops. Together, these tests help characterize disease and guide treatment selection.

CORNEAL IMAGING

Corneal imaging is playing an increasingly important role in my practice, particularly for surgical patients. Corneal topography and tomography are often the first indicators of an unstable tear film, with irregular or inconsistent measurements sometimes driven more by tear film disruption than by true corneal pathology.

Over the past several years, I have become much more proactive about identifying and treating DED before obtaining final keratometry readings or biometry measurements. In cataract and refractive surgery patients, optimizing the ocular surface can improve keratometric reliability, support more accurate IOL calculations, and reduce the risk of postoperative patient dissatisfaction.

Wavefront aberrometry can provide additional insight. For example, measurements with the iTrace (Tracey Technologies) can help distinguish corneal aberrations from internal optical abnormalities. When visual quality improves after a blink or with lubrication, the tear film—not the lens or cornea—is likely the primary driver of symptoms. That distinction is useful for patient counseling and surgical planning.

ADVANCED IMAGING FOR COMPLEX CASES

In complex or refractory cases, anterior segment OCT can provide additional diagnostic depth. Evaluating tear meniscus height, lid margin anatomy, and subtle epithelial or conjunctival changes can help refine the diagnosis and guide management, particularly in patients with DED undergoing ocular surgery.

No single test is necessary for every patient. A layered and intentional approach allows clinicians to deploy diagnostics where they add the most value. Anterior segment OCT is often reserved for patients with moderate to severe DED and atypical presentations.

PUTTING DIAGNOSTICS TO WORK

When used strategically, dry eye diagnostics can help clinicians arrive at the correct diagnosis more quickly, choose the most appropriate therapies, and explain disease mechanisms to patients more clearly. Thoughtful testing can thus transform DED into a condition that can be diagnosed, managed, and monitored with greater confidence over time. ■