A close-up, high-resolution photograph of a woman's face, focusing on her right eye. She has light-colored eyes and a slight smile. The background is a soft, out-of-focus light color.

WOMEN AND DRY EYE

Shining a Light on
This Essential Dry Eye
Disease Segment

REVIEW
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WOMEN AND DRY EYE

Shining a Light on This Essential Dry Eye Disease Segment



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Research in recent years has found that as many as 78.5 million Americans may suffer from dry eye disease (DED), with nearly twice the number of females ages 50 years or older reportedly suffering from the disease than males in the same age bracket.^{1,2,3}

In the clinical realm, not only do women report DED symptoms with a higher frequency, but they also cite the severity and impact on their daily lives to be greater. A 2013 study found that women spent significantly more money per month on dry eye therapies, and expressed greater dissatisfaction with treatment side effects and time to amelioration than their male counterparts.⁴ As the “healthcare gatekeepers” for their families (as described by one group of researchers), women’s personal satisfaction with available ocular care services is mission critical.⁵

If not promptly diagnosed, DED and its systematic effects on female patients’ ocular and vision health is further amplified. According to the Mayo Clinic, dry eye complications include greater risk of eye infection and ocular surface damage, which can lead to inflammation, corneal surface abrasion and ulcers, and vision problems if left unaddressed.⁶

Beyond the physical consequences of DED is the resulting degradation in life quality, reported to be acutely experienced by female patients due to the inability of these patients to perform many everyday activities.⁶ This in turn heightens the risk of psychosomatic disorders, such as depression, stress and anxiety.^{7,8} In severe DED cases, patient utility assessment scores are, somewhat shockingly, comparable to those of acute angina and dialysis patients.^{9,10}

This diverse panel of luminaries sheds light on the truth about today’s experience for female dry eye disease patients, and provides recommendations for diagnosing, treating and managing this unique—and essential—segment of DED sufferers.

– Marguerite McDonald, MD, FACS

The Face of Dry Eye Disease

Dr. McDonald: *Are the dry eye disease statistics cited earlier estimating nearly double the number of women than men, representative of what you are seeing in your practice?*^{2,3}

Dr. Karpecki: This does represent the majority of patients that I see. In fact, the ratio is at least 2:1 women to men in patients over age 50—or, age 44, in my estimate. I'm also noticing a clear hormonal component with DED since the preponderance of these patients are perimenopausal. If you look at the 2014 Beaver Dam Offspring Study as evidence, the incidence of dry eye in the patient population under age 40 was relatively equal between men and women.¹¹

Dr. Bitton: We, too, find this to be the core demographic of dry eyes patients—especially post-menopausal women.

Dr. O'Brien: The data highlighted are also consistent with my experiences in clinical practice, where women are nearly two times as likely to have dry eye disease as men.

Consequences of Neglecting Dry Eye

Dr. McDonald: *Can you talk about the systemic impacts of leaving dry eye disease untreated and how this can negatively impact on a woman's ocular health and overall well-being?*

Dr. O'Brien: We have come to

What Are the Symptoms of Dry Eye?

Dry eye symptoms may include any of the following:

- Stinging or burning of the eye
- A sandy or gritty feeling as if something is in the eye
- Episodes of excess tears following very dry eye periods
- A stringy discharge from the eye
- Pain and redness of the eye
- Episodes of blurred vision
- Heavy eyelids
- Inability to cry when emotionally stressed
- Discomfort with contact lenses
- Decreased tolerance for reading, working on the computer or any activity that requires sustained visual attention
- Eye fatigue

National Eye Institute. What are the symptoms of dry eye? Available at: <https://nei.nih.gov/health/dryeye/dryeye> (last accessed May 1, 2016).

understand that dry eye and ocular surface diseases tend to be progressive. In fact, many eye care providers have begun to view these diseases with an approach similar to glaucoma.¹² Severe DED cases can lead to irreversible ocular surface damage when not under proper management, and similar to glaucoma, dry eye disease can permanently impair goblet cells, limbal stem cell and lacrimal glands, potentially impacting a patient's visual function if left unaddressed.

Dr. Hauser: Agreed. DED is a chronic, progressive condition. Just like any other disease that goes unmanaged, the associated signs and symptoms—such as fluctuating vision, redness and irritation—only worsen with time.

Dr. Bitton: The tear film has many roles, one of which is to

maintain the integrity of the ocular surface. This includes the cornea—the first interface for clear vision as well as the conjunctiva. When the cornea is not kept adequately lubricated it will progress to severe dryness, which will eventually deteriorate vision. Even transient blur throughout the day can impact daily activities, including computer use, reading, driving, etc. Keeping the tear film stable and uniform using a product such as TheraTears® Dry Eye Therapy Lubricant Eye Drops will provide a clear refractive surface, and lubricate the corneal surface for unwavering vision throughout the day.

Symptom Presentation in the Female Patient

Dr. McDonald: *Do men and women with dry eye typically present with different symptoms/complaints?*

Dr. Karpecki: In my experience, women are more likely to seek clinical help at an earlier stage of DED; thus, symptoms such as transient blur, burning, dryness and irritation are more common. Men tend to wait until advanced stages to come to my office, and then frequently complain of blurred vision, which, upon investigation, has



Patient reports fluctuating vision at the end of the day, chronic redness and transient irritation. Photos: Whitney Hauser, OD



Expert DED Management Protocol: Dry Eye Summit

The 2014 Dry Eye Summit put forth basic management recommendations for dry eye disease that include the following protocol:

1. For all patients:
 - **Ocular lubrication**
 - **Lid hygiene**
 - **Nutrition (includes oral nutraceuticals and dietary interventions)**
2. Topical anti-inflammatories when necessary

Improving The Screening, Diagnosis, And Treatment of Dry Eye Disease: Expert Recommendations From The 2014 Dry Eye Summit. Available at: https://www.reviewofoptometry.com/CMSDocuments/2015/6/0615_BioScienceI.pdf (last accessed May 23, 2016).

progressed beyond transient blur from an unstable tear film to significant SPK [superficial punctate keratitis] and epithelial desiccation. They may exhibit redness, photophobia and even ocular neuropathic nociceptor hyperactivity and pain, which are very difficult to treat.¹³

Dr. Bitton: I haven't noticed differences insofar as the actual symptoms that men and women mention, but I have observed distinctions in the way they communicate the information. Female patients are more descriptive, verbally and otherwise; many will come in with a detailed log of when and

where their discomfort occurs, along with a list of medications that they've used in the past. They are very open about how DED is affecting them, beyond the physical manifestations.

Dr. Hauser: I have also found female patients to be more forthcoming about their ocular symptoms and general well-being. Many offer a narrative that provides me with a keener sense of the physical and emotional impact that DED is having in their lives.

Dr. O'Brien: We have tracked gender-specific reporting differences with regard to DED that may impact management and patient satisfaction. Not

only do women report to us DED symptoms with a higher frequency, but they also cite the severity and impact on their daily lives to be greater.

A Comprehensive Approach to Diagnosis

Dr. McDonald: Please walk us through your diagnostic approach when female patients arrive at your practice with DED symptoms and how this strategy might differ for a male patient.

Dr. Hauser: A case history is always a critical component of any clinical exam, but it's especially important for female patients who report dry eye

The Tear Film's Critical Role

The 2007 International Dry Eye WorkShop (DEWS) report, putting forth a new definition of dry eye disease (DED) from an earlier definition presented at the 1995 National Eye Institute Industry Dry Eye Workshop, highlights the critical role the tear film plays relative to dry eye disease:¹

Dry eye is a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability, with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface.

In deciding upon its phrasing, the committee agreed that the updated language needed to reflect new knowledge about the roles of tear hyperosmolarity and ocular surface inflammation in dry eye, along with dry eye's impact on visual function.

A 2012 article in *Clinical and Experimental Optometry* concluded the following about osmolarity and tear film dynamics^{2,3,4,5}

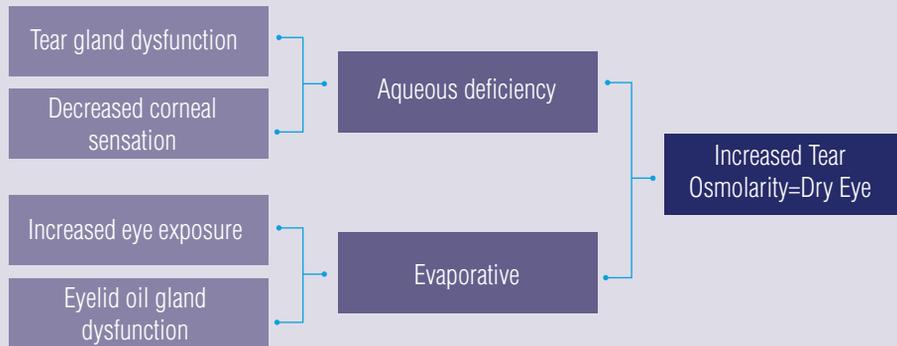
- Equilibrium in tear film production, retention and elimination is vital to promote ocular surface health
- Alterations to any tear film dynamic component will destabilize homeostasis, and lead to ocular surface changes
- An imbalance in tear dynamics can be assessed via tear film osmolarity

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(2):75–92.
 2. Farris RL. Tear osmolarity—a new gold standard? *Adv Exp Med Biol.* 1994;350:495–503.
 3. Tomlinson A, Khanal S, Ramaesh K, et al. Tear film osmolarity: determination of a referent for dry eye diagnosis. *Invest Ophthalmol Vis Sci.* 2006 Oct;47(10):4309–15.
 4. Versura P, Profazio V, Campos EC. Performance of tear osmolarity compared to previous diagnostic tests for dry eye diseases. *Curr Eye Res.* 2010 Jul;35(7):553–64.
 5. Stahl U, Willcox M, Stapleton F. Osmolality and tear film dynamics. *Clin Exp Optom* 2012; 95: 1: 3–11.

Increased Tear Film Osmolarity & Dry Eye

Regardless of the cause of the DED, whether from aqueous deficiency or tear evaporation, the result is the same: increased tear film osmolarity.

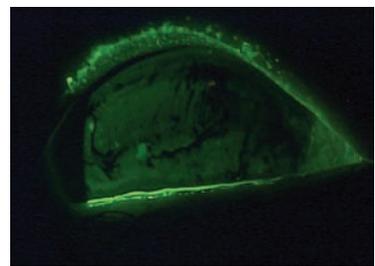
- Aqueous deficiency and increased tear evaporation can both lead to hyperosmolarity



Gilbard JP. The Diagnosis and Management of Dry Eyes. *Otolaryngol Clin N Am*. 2005;38;5:871-85.

symptoms. I often investigate hormonal changes due to birth control pills, pregnancy and perimenopause/menopause. Women aren't always aware that prescriptions originating from their OB/GYN office to address other conditions can impact their eye health. Additionally, I probe deeper into the possibility of autoimmune conditions for female patients, asking about joint pain, fatigue,

patient history, I aggressively screen for conditions that put women at higher risk for dry eye or ocular surface disease. Presence of certain systemic diseases, use of specific medications, previous cosmetic eyelid surgery or laser vision correction, and particular dietary and environmental exposures can play a role in diagnosis. Evidence of aqueous tear-deficient dry eye in the setting of



A patient displaying a scant tear meniscus.
Photo: Paul M. Karpecki, OD, FAAO

We will explain to heavy makeup users where the meibomian glands are located, the role of the meibomian glands, and the importance of lid hygiene and removing oil, debris and other contaminants that can build up on the eyelids and eyelashes. - Dr. Bitton

muscle weakness and dry mouth. Though autoimmune diseases affect less than 10% of the population, nearly 80% of those people are women.¹⁴ And diseases like Sjögren's syndrome can take as long as a decade to diagnose. In terms of diagnostic testing, I may be more likely to order tests for aqueous-deficient dry eye, including phenol-red thread and tear meniscus height.
Dr. O'Brien: In building the

dry mouth and arthritis might trigger me to test for Sjögren's syndrome, in cooperation with the patient's internal medicine doctor or rheumatologist.
Dr. Bitton: Typically, I don't vary my approach to testing between genders, although we do ask additional questions about DED, dry mouth and overall dryness of mucous membranes to tease out the possibility of Sjögren's syndrome. But during the workup, we take time to

educate patients about how their behavior can affect their ocular health. For example, we will explain to heavy makeup users where the meibomian glands are located, the role of the meibomian glands, and the importance of lid hygiene and removing oil, debris and other contaminants that can build up on the eyelids and eyelashes. Using TheraTears® Sterilid® twice a day can help the patient maintain a healthy lid margin.
Dr. Karpecki: For female patients, I more commonly perform ocular surface staining to assess for Sjögren's syndrome, and recommend blood testing for the disease. Given that androgen deficiency can cause dry eye, I am also evaluating for symptoms such as dry mouth or dryness of any mucous membranes, and



other factors that may provide diagnostic clues.

Customizing Therapy for the Female DED Sufferer

Dr. McDonald: *Are there treatments that you consider specifically/primarily for female patients?*

Dr. O'Brien: I look at the overall wellness picture of my female patients before laying out my protocol. Sometimes that means subtracting or adjusting medications being taken for other conditions that are having unintended negative effects on the tear film and ocular surface. A 2001 study found that women who use hormone replacement therapy (HRT), particularly estrogen alone, were at increased risk of dry eye syndrome; clinicians should be aware of this potential complication and build a detailed history of women's medications, including prescribed/unprescribed treatments, oral

contraceptives, antihistamines, antidepressants as well as HR.¹⁵ At times it may be efficacious to comanage with a woman's gynecologist, internist, rheumatologist, psychologist or psychiatrist to make alterations to therapies.

Dr. Karpecki: I approach treatment for all patients using a similar strategy as we discussed at the Dry Eye Summit (see *Expert Basic DED Management Protocol: Dry Eye Summit* on page 4.) For the majority of practitioners, this means starting patients with ocular lubrication, lid hygiene and nutrition, and then adding additional treatments as the disease necessitates. A recent study showed that the combination of these three treatments (using: TheraTears® Dry Eye Therapy Lubricant Eye Drops, TheraTears® SteriLid® Eyelid Cleanser, and TheraTears® Eye Nutrition) improved dry eye signs and symptoms.¹⁶

Dr. Hauser: Women of all ages use creams, lotions and other beauty products around their eyes, but doctors rarely address the potential contribution to ocular surface disease. I regularly ask patients about the products they use and how they remove them. One eyelid cleanser I recommend for ongoing management, especially for my female patient is TheraTears® SteriLid®. Patients prefer the natural formulation containing tea tree oil. And the product removes oil, debris and other contaminants that can build up on eyelids and eyelashes, as part of an easy, 60-second process that the woman can incorporate into their daily regimen. Women seem to be more open to aggressive strategies to slow DED progression. I have seen greater reception by female patients to new procedures, and I find less resistance to and greater compliance with ocular nutrition recommendations, in my female patients. Women tend to appreciate a wellness model versus waiting to treat a worsening chronic condition.

Transforming Lives With Proper Care

Dr. McDonald: *How can the right/appropriate DES care positively impact female patients?*

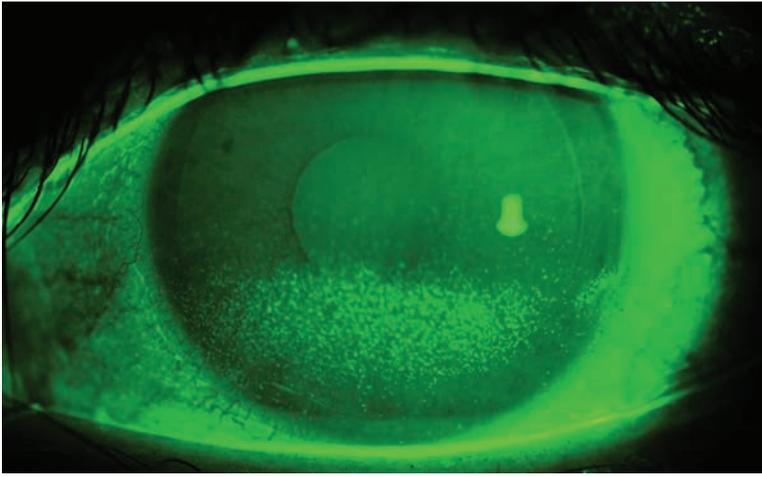
Dr. Bitton: One patient, a 73-year-old female, who came to me for severe evaporative dry eye, could barely open her eyes during the first visit. The woman lived alone and found that she could no longer run quick errands to the bank, pharmacy or grocery store because the dryness had gotten so pervasive. She admitted that she had lost her independence, and felt angry and embarrassed that she had to depend on others to do her chores. She felt like a burden to her son and was hesitant to call him. As she recounted her situation, she cried out of complete desperation. The patient had elevated tear film osmolarity and, hence, was placed on proper lubricants (e.g., TheraTears® Dry Eye Therapy) that improved the quality of her tear film. The patient slowly became more independent, even if it meant she had to break up errands into several trips a day. Follow-up visits reveal she is improving, so much so that she joined a knitting group. I smile every time I see the patient's name on my schedule, and this woman continues to thank me for restoring her independence.

Dr. Hauser: Female patients tend to speak very candidly with me during the exam. Perhaps they have a high level of comfort, because they feel like we're talking woman-to-woman. At the conclusion, patients will often say something like, 'Thank you, I finally understand.' Many doctors think that women with dry eye disease just want a cure. Naturally, that would be ideal. However, what most of them want is answers. Why do I have this? What's happening to me? Providing knowledge and information validates their physical symptoms and emotional struggle with the disease.

Turning to Nutritional Supplements

Dr. McDonald: *Are there any nutritional supplements geared toward women with DED? If so, which, if any, do you incorporate in your treatment/management plan?*

Dr. O'Brien: The use of omega-3 essential fatty acid supplementation may benefit female DED patients, according to a 2013 study.¹⁷ Researchers found specific improvements for meibomian gland disease and blepharitis, noting that omega-3 fatty acids "have a definite role in dry eye disease." (The extent to which omega-3 affected tear production and secretion was unknown, as



Superficial punctate keratitis (SPK) in the lower quadrant is typical of dry eye, especially with an incomplete blink. Photo: Etty Bitton, OD, MSc, FAAO

investigators indicated further exploration was needed.¹⁷⁾ Vitamin E can augment an omega-3 strategy, since long-term use of fish oil may deplete vitamin E levels. Thus, I recommend TheraTears® Eye Nutrition supplement, which includes vitamin E while exhibiting a favorable balance of essential fatty acid precursors. **Dr. Karpecki:** In some female cases of DED, I feel more confident in successful results if a patient is taking an omega-3 fatty acid that combines EPA/DHA with flaxseed oil, which tends to be better metabolized by women than men.

The Invisible Cost of Dry Eye

Dr. McDonald: *How have you observed DED affects women from a quality-of-life standpoint?*

Dr. Bitton: Women don't just give me their patient history when they come to see me; they tell me about all of the activities that they've limited or stopped completely (e.g., leisure reading, knitting, going out to dinner/shows/activities) due to external factors such as air conditioning, wind and heating vents, exaggerating their condition. I have had female

DED patients who became so despondent prior to seeing me, they sought medical assistance for their associated depression.

Dr. Hauser: Quality of life is one of the most underestimated components of caring for the female dry eye patient. Worsening symptoms, such as blurred vision and irritation, can affect the work and home life, which seems to further magnify symptoms further for patients and perpetuate the vicious cycle of unhappiness.

Dr. Karpecki: What has fascinated me over the years is, when I successfully treat a female patient with DED, they just as often mention how much I've affected their lives as their eyes. I've had women tell me about the confidence restored in their work and social lives, now that they no longer face the world with red, tired-looking eyes, or intrusive questions about whether they have been crying. Other patients say they can finally stop worrying that people will think they have been drinking alcohol or taking drugs.

Dr. O'Brien: As has been shown by this panel and supporting research, it is clear that dry eye disease affects women more profoundly than men—

not only from a prevalence standpoint but from a holistic perspective. Therefore, it is crucial to first aggressively screen women for the presence of dry eye. Secondly, it is imperative that clinicians consider the systemic as well as overall effects of DED on the female patient. A systematized approach to restoration of the tear film including qualitative and quantitative strategies, as well as cleansing the lid margins and surroundings to reduce excessive microbial colonization, and balancing nutrition towards a noninflammatory state ensures optimal success in improving symptoms and signs, patient satisfaction, and ultimately, quality of life. ■

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

Reference: 1. Srinivasan S, Ngo W, Jones L. The relief of dry eye signs and symptoms using a combination of lubricants, lid hygiene, and ocular nutraceuticals. Poster presented at: ARVO annual meeting, April 2015; Denver, CO.

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